UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UBER TECHNOLOGIES, INC.,
Petitioner

v.

SURGETECH LLC,
Patent Owner

Case IPR2023-00738
Patent 11,475,047

EXPERT DECLARATION OF AMELIA REGAN PHD IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,475,047

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APPENDIX A (C.V., List of Publications, List of Testifying Experience)
APPENDIX B (List of Materials Considered)
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I, Dr. Amelia Regan, hereby declare under penalty of perjury under the laws of the United States of America:

I. INTRODUCTION

1. I have been retained to provide assistance regarding U.S. Patent No. 11,475,047 ("the '047 patent"). Specifically, I have been asked to consider the validity of claims 1-6 of the '047 patent (the "Challenged Claims"). Except as otherwise indicated, I have personal knowledge of the facts and opinions set forth in this declaration, and believe them to be true. If called upon to do so, I would testify competently thereto.

2. I am being compensated for my time at my standard consulting rate of $350 per hour for code and document review, $500 per hour for depositions, and $600 per hour for court appearances. I am also being reimbursed for expenses that I incur during the course of this work. My compensation is not contingent upon the results of my study, the substance of my opinions, or the outcome of any proceeding involving the Challenged Claims. I have no financial interest in the outcome of this matter or in the pending litigation between Petitioner Uber Technologies, Inc. and Patent Owner SurgeTech LLC.

3. A table of contents and a list of exhibits referenced herein are included above.

II. BACKGROUND AND QUALIFICATIONS

4. I offer statements and opinions on behalf of Uber Technologies, Inc. ("Uber"), generally regarding the validity, novelty, prior art, obviousness considerations, and understanding of a person of ordinary skill in the art as it relates to the '047 patent. Attached hereto as Appendix A is a true and correct copy of my Curriculum Vitae describing my background and experience.

5. I am an expert in computerized systems for managing transportation and logistics, including systems related to congestion pricing, optimal contracting, dynamic vehicle allocation, and freight transportation planning, with over 30 years of research and development experience. My research and development endeavors cover various technologies related to systems for managing supply chain transportation and logistics, including the development of systems and computational methods to improve the efficiency, sustainability, and security of transportation systems.

6. I earned a B.A.S. in Systems Engineering from the University of Pennsylvania in 1987, an MS in Applied Mathematics from The Johns Hopkins University in 1990, and an MSE and Ph.D. in civil engineering from the University of Texas at Austin in 1995 and 1997, respectively.

7. I am currently the Director of the Supply Chain Transportation & Logistics Graduate Degree Program and a teaching professor in the Department of

Civil & Environmental Engineering at the University of Washington, where I teach classes such as Introduction to Supply Chain Transportation and Logistics and Freight Transportation. My current research work at the University of Washington relates to congestion pricing, combinatorial optimization, warehouse logistics, optimal contracting, freight transportation planning, technology adoption in transportation, and matching markets for urban resource allocation. I am a named inventor on patent applications related to combinatorial optimization problems and logistics.

8. Before beginning my tenure at the University of Washington, I was a Professor of Computer Science and a Professor of Civil & Environmental Engineering at the University of California, Irvine, where I am now Professor Emeritus of Computer Science and Transportation Systems Engineering. In addition to teaching classes such as Transportation Economics, Advance Transportation Systems and Analysis: Introduction to Mathematical Programming, and Analysis of Algorithms, I performed research focused on dynamic and stochastic network operations, on-line auction mechanism and algorithm design, optimal contracting, logistics systems analysis, warehouse logistics, freight industry analysis, and shipper behavior modeling.

9. I am a member of numerous professional societies, including the Institute for Operations Research and Management Science (where I was the Chair

of the Transportation Science Section from 2004–2005), the Transportation Research Board, and the Institute of Electrical and Electronics Engineers, and the World Congress on Transportation Research. I am also on the editorial board of the *International Journal of Advanced Logistics* and have reviewed papers for journals such as the *European Journal of Transport and Infrastructure Research, Networks and Spatial Economics*, and the *World Congress of Transportation Research*, among others.

10. My work has been published numerous times in connection with industry conferences and has been published in over 150 articles in peer-reviewed journals such as *IEEE Transactions on Intelligent Transportation Systems*, *IEEE Transaction on Vehicular Technology, Operations Research Transportation Science, and Transportation Research*, Parts B, C, and E. My published work and presentations include topics such as dynamic vehicle allocation, real option pricing of network design investments, matching mechanisms for congestion pricing, and rule-based price discovery methods in transportation procurement auctions.

11. I have received numerous awards for my work, including an NSF CAREER award and recently, a best paper award for my 2019 paper entitled "Spatio-Temporal Clustering of Traffic Data with Deep Embedded Clustering," which was published in *Proceedings of the 3rd ACM SIGSPATIAL Workshop on Prediction of Human Mobility.*

12. I have supervised twenty-two Ph.D. dissertations and my students have taken faculty positions in the US, Canada, China, Hong Kong, Taiwan, and South Korea. Others hold high-level positions in industry and transportation and logistics consulting.

13. Prior to my academic career, I worked as a software engineer, operations research analysis, and industrial engineering supervisor at United Parcel Service (UPS) building their first-generation routing and scheduling system. Before my work at UPS, I worked at the Association of American Railroads on large-scale network modeling of the North American freight rail system.

14. Other details concerning my background, academic work, and professional history are set forth in my *curriculum vitae*, which is attached as Appendix A to this declaration.

15. A listing of the papers that I have authored and co-authored and a list of my testifying experience is included in Appendix A.

III. PRIORITY DATE AND ONE OF ORDINARY SKILL

16. I have been advised that a person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. I further understand that a person of skill in the art is also a person of ordinary creativity and that in many cases a person of ordinary skill will be able to fit the teachings of multiple patents or printed publications together. I also

understand that the factors that may be considered in determining the level of ordinary skill in a particular field include: the level of education and experience of those working in the field; the types of problems encountered in the field; and the sophistication of the technology at the time of the invention, which I understand Patent Owner asserts is May 18, 2006. I understand that all of the above factors may be present in a particular case. I understand that a person of ordinary skill in the art is not a specific real individual, but instead is a hypothetical person having the qualities reflected by the above-discussed factors. I understand that a person of ordinary skill in the art would have knowledge from the teachings of the prior art, including the art discussed below.

17. In my opinion, on or before May 18, 2006, persons of ordinary skill in the art ("POSITA") relating to the technology of the '047 patent would have had a bachelor's degree in software, computer, or electrical engineering, computer science, or industrial engineering and management with at least two years' experience in inventory and pricing management, including with respect to systems for dynamically managing inventory and pricing of transportation services or other types of inventory, or the equivalent. Additional graduate education could substitute for professional experience, or significant experience in inventory and pricing management could substitute for formal education.

18. Well before May 18, 2006, my level of skill in the art was at least that of POSITA. I am qualified to provide opinions concerning what POSITA would have known and understood as of May 18, 2006, and unless otherwise stated, my analysis, opinions, and conclusions herein are from the perspective of POSITA as of that date.

IV. MATERIALS RELIED UPON

19. In reaching the conclusions described in this declaration, I have relied on the documents and materials cited in this declaration as well as those identified in Appendix B to this declaration. These materials comprise patents, related documents, and printed publications. Each of these is a type of document that experts in my field would reasonably rely upon in forming their opinions.

20. My opinions are also based upon my education, training, research, knowledge, and personal and professional experience.

V. BACKGROUND ON THE STATE OF THE ART

21. In my opinion, prior to May 18, 2006, the prior art had already disclosed systems and methods of managing inventory, including systems and methods of managing online bookings for transportation services inventory.

22. For example, U.S. Patent Pub. No. 2007/0075136 ("Jacob") (the primary reference herein), which was filed on September 25, 2005 and published on April 5, 2007, disclosed "a system and method for managing time-dependent

inventory such as hotel rooms, rental automobiles, and airline seats" including "a plurality of selling channels" such as "global distribution systems (GDS's) such as Apollo™ or Sabre™, telephone reservation systems, a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems, and tour operators." *E.g.*, EX1004 (Jacob), ¶[0007]. Jacob disclosed that its "system and method may be used to manage the price of inventory, the type of inventory, and the dates the inventory is offered for sale," and that its system and method "simplify the management of inventory across multiple inventory types." *E.g.*, EX1004 (Jacob), Abstract.

23. Another reference, Japanese Patent Application Publication JP 2005-332346 ("Tamura") (a secondary reference herein), published on December 2, 2005, disclosed a "sales management system" that "reduces the risk of bad inventory for retailers of apparel and other merchandise while reducing lost sales opportunities." EX1005 (Tamura), ¶[0009].

24. Similarly, Japanese Patent Application Publication JP 2002-104622 ("Kono") (a secondary reference herein), published on April 10, 2002, disclosed a "market inventory control system" and a "market inventory control method" that "are applied to a goods distribution system that sells products from a maker, which is a manufacturer, to retail stores nationwide via a plurality of agencies," and disclosed that its system and method "effectively use[] market inventory by

collective control of inventory control of each agency by manufacturers." EX1007 (Kono), ¶¶[0001], [0008].

25. Moreover, U.S. Patent No. 7,996,265 ("Evangelist") (a secondary reference herein), filed on May 19, 2005, disclosed a "system and method for fulfilling a media request" that "initially allocates inventory," including "on-line inventory" for "distribution through… channels" such as "on-line" channels. *E.g.*, EX1010 (Evangelist), Abstract, 7:29-36, 8:16-23; 9:48-51.

26. Additionally, U.S. Patent Pub. No. 2006/0085296 ("Strickland") published April 20, 200 and filed September 30, 2004, disclosed "[a]n inventory modeling and management system and method" which included "determining whether there are inventory excesses and shortfalls for selected SKUs at selected fulfillment nodes, and analyzing the inventory excesses and shortfalls for rebalancing opportunities." EX1012, Abstract.

27. Likewise, as another example, U.S. Patent Pub. No. 2002/0186144 ("Meunier"), published December 12, 2002, disclosed "an automated vehicle rental systems for a fleet of rental vehicles, where the vehicles are geographically distributed," including "a central reservations management and location system… performing all reservations and management functions" and that is "linked to a database containing a location and available of th[e] vehicles and a rate for rental"

and further "provided with an allocation manager system for geographically allocating vehicles." EX1013, Abstract.

28. Additionally, "Electronic Distribution Channels' Effect on Hotel Revenue Management" ("Choi"), published in June 2002 in "*Cornell Hotel and Restaurant Administration Quarterly*," disclosed "[s]ophisticated revenue-management systems apply an inventory-allocation algorithm to make the best allocation decisions…." EX1026 (Choi), 2. Those in my field (including POSITA) were aware of that journal, which was a regularly published journal, and would have been looking for papers published therein. EX1027, EX1028. Choi described "[t]he emergence of internet-enabled distribution channels" for hotels, noting that "[t]he potential to reduce distribution costs using internet channels has made hotel managers more conscious of the need to ***maximize contributions to gross profit (revenue less distribution costs)*** rather than just the revenue obtained from a given room sale. In addition to ***considering rate and timing of sales***, hotel managers must evaluate the ***effects of distribution-channel management*** on their current revenue-management practices ["selling the right inventory to the right customer for the right price at the right time"] and determine how to benefit from it." EX1026 (Choi), 1-2, 3-4 ("Recently, internet-enabled company web sites and various online travel agencies have become additional channels for hotels. The variable cost of a booking through these various channels can vary from nearly nothing to $35 or more."; "In

general, company web sites are owned and managed directly by the hotel companies, while online agencies are third-party intermediaries between hotels and customers… the cost of booking through internet channels can vary considerably"; "travel agents generally charge a 10-percent commission"). "A reasonable proposition is that it is ***most beneficial for hotels to book reservations through the least-expensive channels, if there is sufficient demand via those channels***. To manage revenue by distribution channel, revenue-management forecasting and optimization models must be revised to consider the relevant information," and "hotels with a small gap between room rates and a wide range of distribution costs are likely to attain a larger benefit from the extended method" of revenue forecasting for inventory allocation using "rate, length of stay, *and distribution channel*." *E.g.*, EX1026 (Choi), 4, 8. Choi further disclosed the importance of variable pricing and price differentiation: "One offers discounted rates to stimulate demand for inventory that would otherwise go unsold, but limits the availability of the discounts to customers who are willing to pay a higher price to gain, for example, last-minute accommodations, or to those who must have a particular room at a particular time." *E.g.*, EX1026 (Choi), 2 ("inventory-allocation decisions help reservation agents decide whether to accept or reject a reservation request"). As Choi described, "Since the hotel industry adopted revenue management in the 1980s, it has been developed and practiced by different hotel companies at varying levels of sophistication. Some hotels use daily

occupancy forecasts to determine rate availability, while others develop multiple arrival forecasts for combination of rate, length of stay, and room type, and optimize the inventory allocation at every 15th booking." EX1026 (Choi), 2-3 ("Detailed forecasts by rate category and length of stay have been shown to reduce forecast error."). And Choi disclosed automatic computerized allocation of room inventory, describing that "[a]llocation decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions," while noting "responsible personnel" may override this automatic allocation by "review[ing] and adjust[ing] the system's recommendations." EX1026 (Choi), 2-3.

29. As another example, "Pricing and Revenue Optimization" ("Phillips"), published in 2005, discussed the basic economics underlying pricing decisions (*e.g.*, "how companies should set and adjust their prices in order to maximize profitability," including the history "of pricing and revenue optimization" using "analytical techniques derived from management science" since "the 1980s"), and disclosed "[c]omputerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented," EX1029 (Phillips), 1, 121, including "real-time" aspects of revenue management used by *e.g.*, "airlines, hotels, [and] rental car companies," EX1029 (Phillips), 123, 15 ("***Revenue management has been one of the most important and publicized applications of***

pricing and revenue optimization over the past two decades. While it has its ***origin in the airline industry***, it has spread beyond the airlines and ***is in widespread use at hotels, rental car firms, cruise lines***, freight transportation companies, and event ***ticketing agents***."), 122-23 ("***American [Airline]'s success prodded other major airlines in the United States to develop revenue management capabilities*** of their own. ***Throughout the remainder of the 1980s and well into the 1990s***, carriers such as ***United, Delta, and Continental*** invested millions of dollars in implementing computerized revenue management systems and establishing revenue management organizations"; "***Hotels and rental car companies*** followed the airlines in adopting revenue management… ***Vendors such as PROS and Talus Solutions developed and sold commercial revenue management software packages***. The ***next wave*** of adopters included ***cruise lines, passenger trains***…."), 125-126 (American's "SABRE combines the functions of a computerized reservation system (CRS) and a global distribution system (GDS). The key function of a reservation system is to serve as the repository of all the bookings that have been accepted for future flights. The ***reservation system also contains the controls that specify how many bookings from different fare classes the airline will accept*** on future flight departures. A reservation system is a critical capability for any revenue management company. Many large airlines, hotels, and rental car companies have developed their own systems, while many smaller companies are "hosted" by commercial providers of

reservation services."; "The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan.[] Each GDS ***distributes schedule, fare, and booking availabilities to the agencies*** and ***transmits bookings and cancellations*** from the agencies ***to the airlines***."). Phillips further stated that "[e]very major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function[, and t]hese departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms." EX1029 (Phillips), 121, 33 ("At this point, most companies consider adopting some sort of computerized pricing support system"). And Phillips discussed, for example, how a "revenue management system receives a feed of bookings and cancellations from the reservation system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems." EX1029 (Phillips), 134. "[A]t the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***… Within a very short time (**typically less than 200 milliseconds**), the reservation system needs to send a message whether or not [a reservation] request can be accepted." EX1029 (Phillips), 136. As Philips described, "[i]n very rapidly changing environments such as the passenger airlines, the majority of prices will be

updated automatically, with analysts only investigating the unusual or unexpected situations." Phillips further explained that part of the task of maximizing expected net revenue (or "expected net contribution") involves accounting for the incremental costs presented by the different sales channels to which inventory is allocated, and, *e.g.*, "airlines and hotels can… determine whether or not to provide availability through [a particular] channel." EX1029 (Phillips), 136-138. And when a "seller" (such as a "widget maker") faces projected demand exceeding supply, Phillips noted that "the seller could use a combination of allocations and price rises to manage the shortage." EX1029 (Phillips), 101.

30. Thus, prior to May 18, 2006, there were already numerous inventory management systems disclosed in the prior art.

31. The claims of the '047 patent generally require establishing a channel interface that provides bidirectional communication between a server computing device and vendor computing device, storing a channel record for each of a plurality of distribution channels, receiving from the vendor computing device a selection from the distribution channels of at least one participant channel for a transportation service, establishing at least one active and one inactive channel record based upon the participant and non-participant channels, respectively, linking the active channel records to the channel interface, receiving in real time for the participant channels corresponding to the active channel records sale data corresponding to at least one

additional vendor computing device, determining, in real time, a performance indicator based on the sale data, and adjusting a price of transportation services for each participant channel by an adjustment factor depending on whether the performance indicator indicates a performance that meets or does not meet a performance threshold. *E.g.*, EX1001 ('047 patent), 1:50-2:21, 2:53-59.

32. In my opinion, each of the above-described features was well-known to POSITA long before May 18, 2006.

33. The first feature—***establishing a channel interface that provides bidirectional communication between at least one server computing device and a vendor computing device***—was well-known long before May 18, 2006.

34. For example, as discussed above, Jacob disclosed, *e.g.*, "a system and method for managing time-dependent inventory such as hotel rooms, rental automobiles, and airline seats" including "computer software or computer hardware or a combination of computer software and hardware," running *e.g.*, the "RezTrip" application, as well as multiple "clients" of the RezTrip application, including vendors such as "Individual Properties," a "group of properties," and a "management company or chain that owns several properties." *E.g.*, EX1004 (Jacob), ¶¶[0007], [0082], [0093]-[0094]. Jacob disclosed that the RezTrip application "may be configured to communicate with the hotel staff, the hotel property management database, and a plurality of selling channels." *E.g.*, EX1004 (Jacob), ¶[0007].

35. Jacob further disclosed that a "Property" is "initially" "administer[ed]" by setting it up in the system with "relevant Property information" (such as room "types" and "rates") and that such information is stored by the RezTrip application. *E.g.*, EX1004 (Jacob), ¶[0086], Fig.8 (showing Property communicating with RezTrip database), Fig.12 (showing examples of RezTrip vendors (*e.g.*, "Properties"):

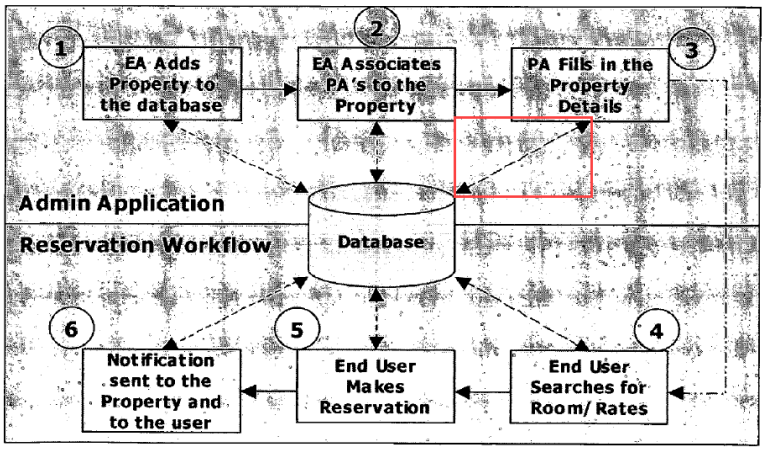


Figure 8

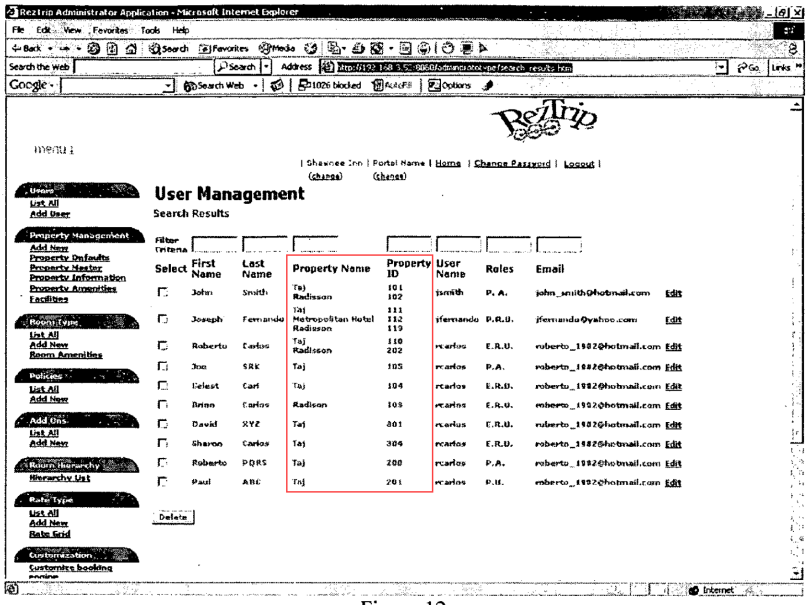
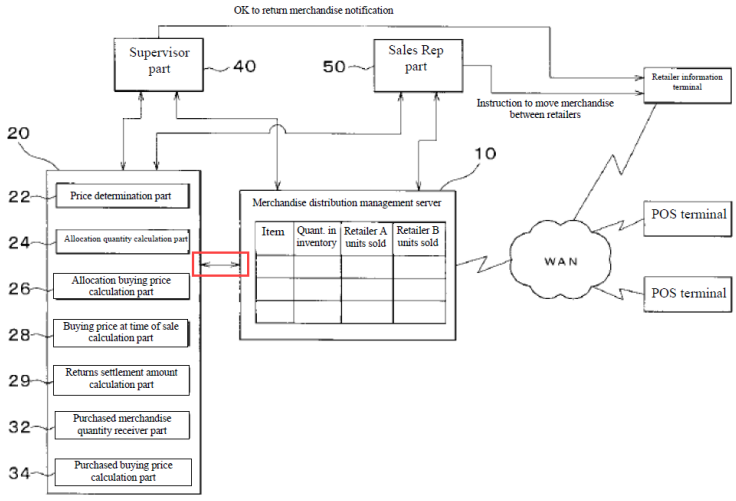


Figure 12

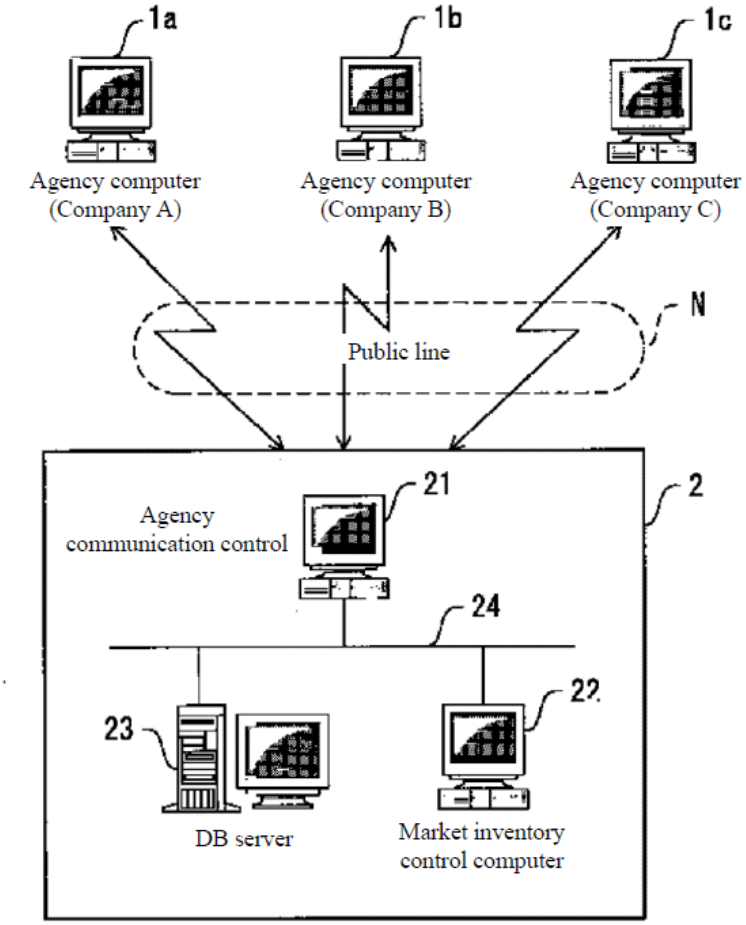
36. Tamura disclosed a "sales management system" including, *e.g.*, a vendor computing device (*e.g.*, "sales management server 20," "sales rep part 50") and a server computing device (*e.g.*, "merchandise distribution server 10") that communicate sale data and other information to one another through, *e.g.*, a "network." EX1005 (Tamura), ¶¶[0017], [0026], [0031], Figs.1, 3:

Fig. 3



37. Kono, in turn, similarly disclosed "a market inventory control system" including, *e.g.*, a server computing device (*e.g.*, "Agency communication control computer") and a vendor computing device (*e.g.*, "Market inventory control computer" and "DB server"/"database server") that communicate information such as sale data or instructions for product transfer with one another through, for example, a "LAN." *E.g.*, EX1007 (Kono), ¶¶[0024]-[0025], cl.1, Fig.1:

[FIG. 1]

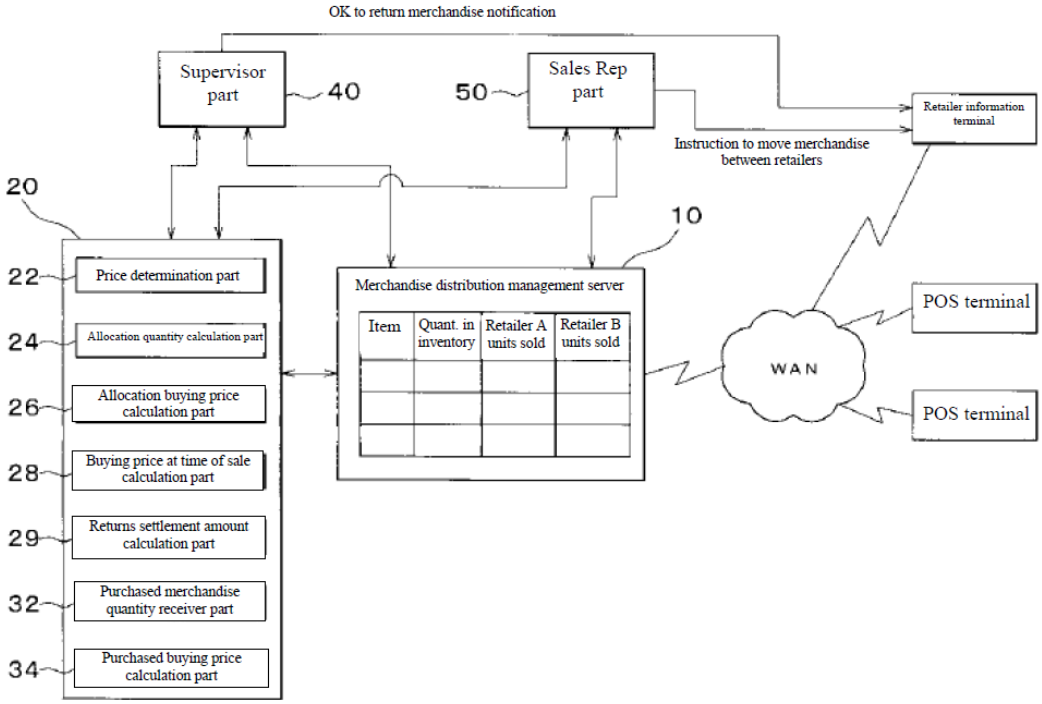


38. The second feature—***storing, via a channel data structure, a channel record for each of a plurality of distribution channels***—was also well-known long before May 18, 2006.

39. For example, Jacob disclosed a "plurality of selling channels" including "a hotel website," "internet web merchants," and "GDS systems" and a "database configured to manage hotel data," comprising data such as "inventory data," "availability data," "audit trail data, "sales channel data," "communications data," and "other data." *E.g.*, EX1004 (Jacob), ¶¶[0007], [0084].

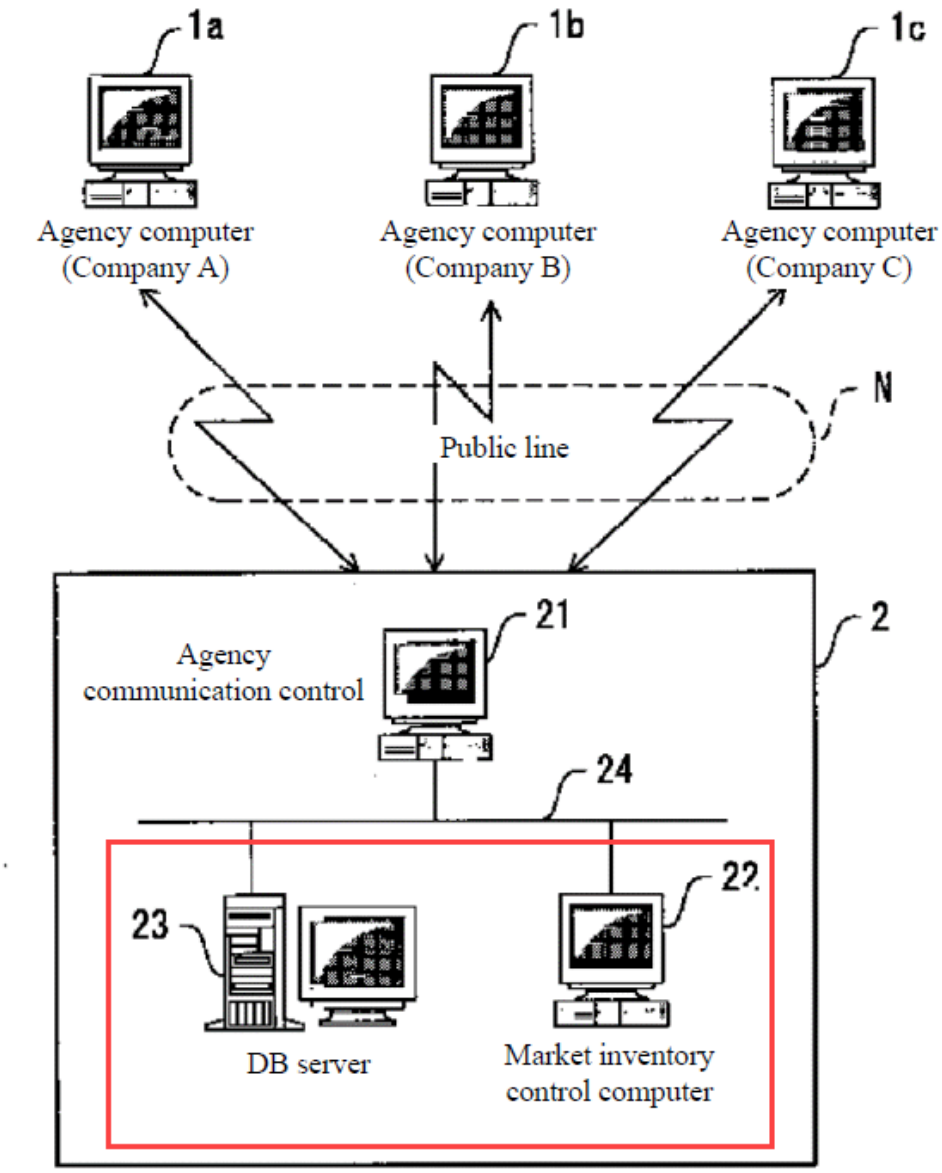
40. Additionally, Tamura disclosed, for example, "recording" in its "sales management system" (including in its "merchandise distribution management server," various types of "merchandise distribution information" for specific retailers, including the number of units of each item sold by each "retailer." EX1005 (Tamura), ¶¶[0014], [0017], Fig.3 (incl. table in item 10):

Fig. 3

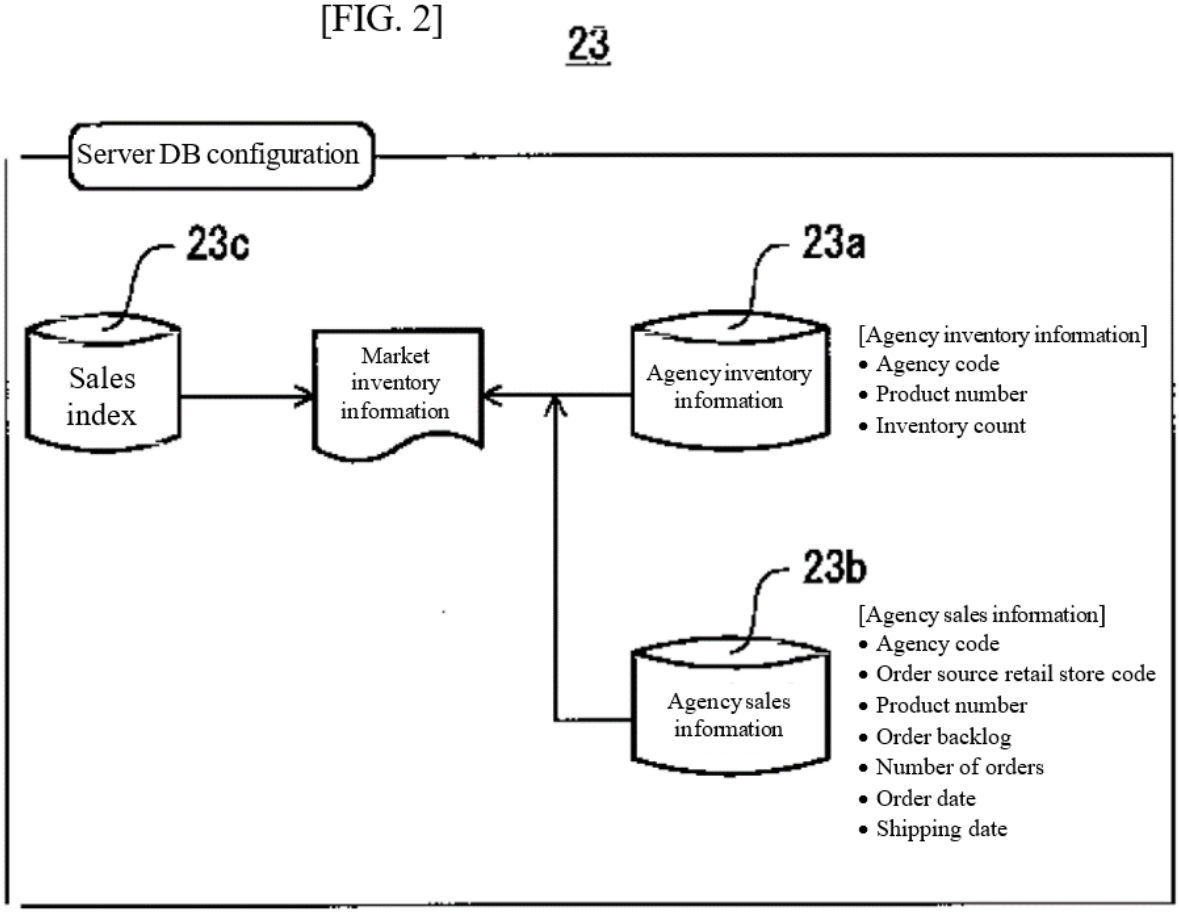


41. Kono, in turn, similarly disclosed "a market inventory control system" with multiple channels, or "agencies," selling inventory. As Kono described and illustrated, its system stores, *inter alia*, "acquired product sales information" for each of its sales channels (*e.g.*, "agencies") and "product inventory information" in databases such as an "agency sales (shipping) information database," (*e.g.*, each "Inventory Count" and "Shipping Volume" for each "agency"). *E.g.*, EX1007 (Kono), ¶¶[0026], [0042]-[0043], Figs.1, 2, 4:

[FIG. 1]


1a
1b
1c
Agency computer (Company A)
Agency computer (Company B)
Agency computer (Company C)
N
Public line
2
21
Agency communication control
24
23
22
DB server
Market inventory control computer

[FIG. 2]



[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

42. Additionally, U.S. Patent No. 7,996,265 ("Evangelist") (a secondary reference herein), which was filed May 19, 2005, disclosed a "system and method

for fulfilling a media request" that stores inventory information for each sales channel (*e.g.*, "store")—*e.g.*, that "Controller 100 updates inventory information 212 based on fulfilled requests, returned media, inventory updates and reconciliations, and other communications and activities in system 10." *E.g.*, EX1010 (Evangelist), 5:20-26, Figs.1-3:

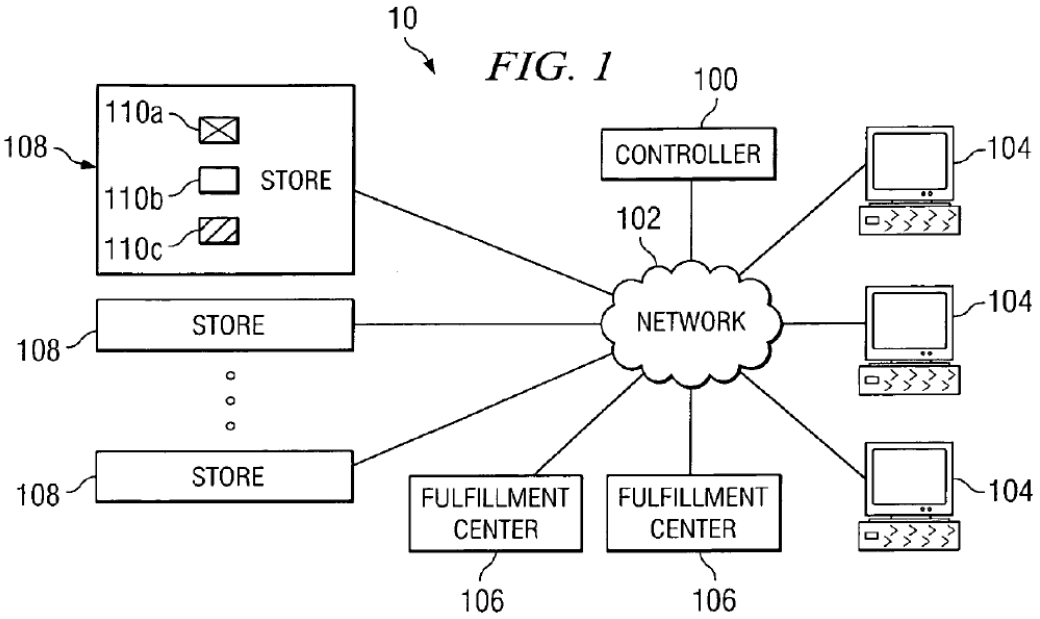


FIG. 2

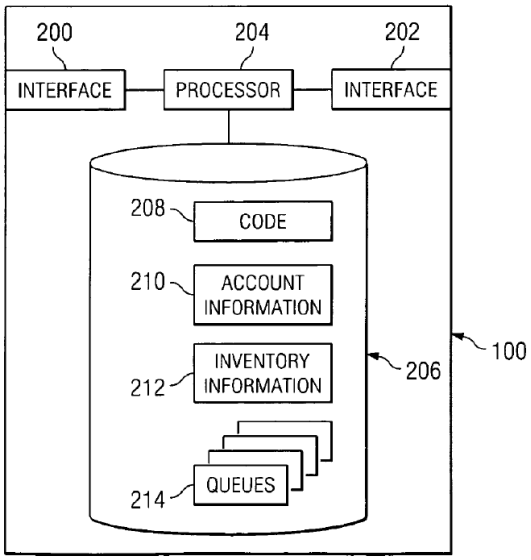
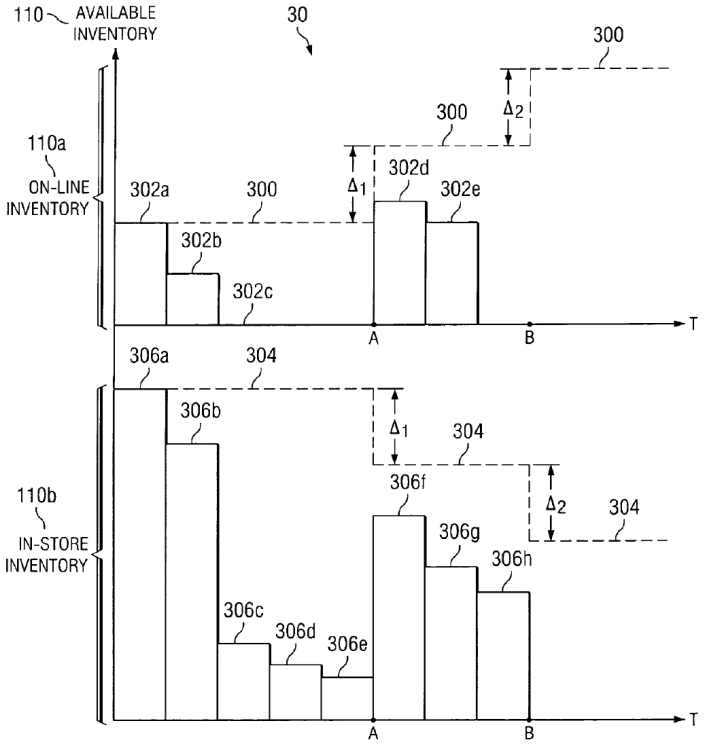

200
204
202
INTERFACE
PROCESSOR
INTERFACE
208
CODE
210
ACCOUNT INFORMATION
212
INVENTORY INFORMATION
214
QUEUES
206
100

FIG. 3


110
AVAILABLE INVENTORY
30
110a
ON-LINE INVENTORY
110b
IN-STORE INVENTORY
300
302a
302b
302c
302d
302e
306a
306b
306c
306d
306e
306f
306g
306h
304
Δ1
Δ2
A
B
T

43. As another example, Meunier disclosed "an automated vehicle rental system for a fleet of rental vehicles, where the vehicles are geographically distributed[,]" which includes a "central reservations, management and location system (CRMLS) in communication through a communications network" that "perform[s] all reservations and management functions." *E.g.*, EX1013 (Meunier), Abstract. The CRMLS is "linked to a database containing a location and availability of each" vehicle and is "provided with an allocation manager system for geographically allocating vehicles" to rental locations. *E.g.*, EX1013 (Meunier), Abstract, ¶[0062], cls.1, 18, Fig.5B:

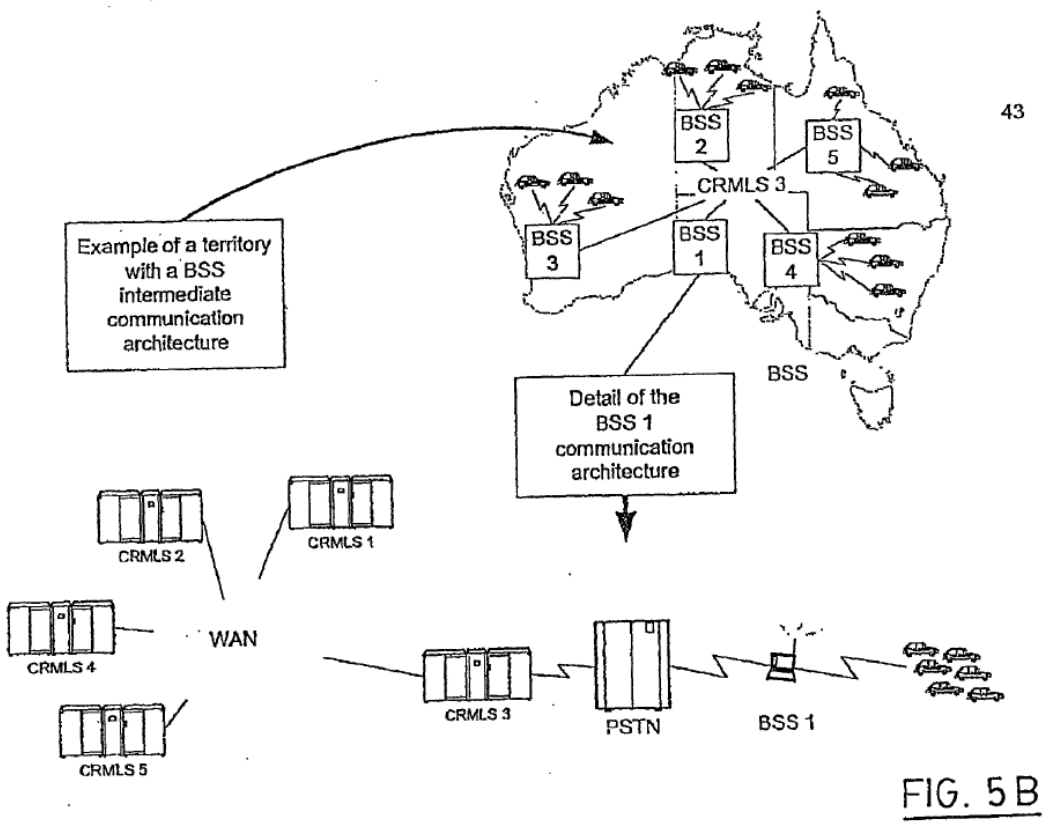


FIG. 5B

44. Another feature—***receiving, from the vendor computing device through the channel interface, a selection, from the plurality of distribution channels, of one or more participant channels for a transportation service***—was also known throughout the art prior to May 18, 2006.

45. For example, Jacob disclosed its "plurality of selling channels" include "a hotel website," "internet web merchants," and "GDS systems" and vendors (*e.g.*, "Properties") and further disclosed setting up an allocation of transportation services inventory to such distribution channel using the RezTrip application. *E.g.*, EX1004 (Jacob), ¶¶[0007], [0191]. Jacob disclosed that a "Property" is "initially" "administer[ed]" by setting it up in the system with "relevant Property information" (such as room "types" and "rates"), after which customers "may… make a reservation" through the channels to which the Property's inventory has been allocated. *E.g.*, EX1004 (Jacob), Abstract, ¶¶[0007], [0077], [0085], [0086] ("Once the PA [Property Administrator] has set up the Property within the system, EUs [End Users] may… make a reservation"), [0154] ("A Property does its bookings through various channels"), Fig.7 (showing communication of rates and inventory availability to sales channels):

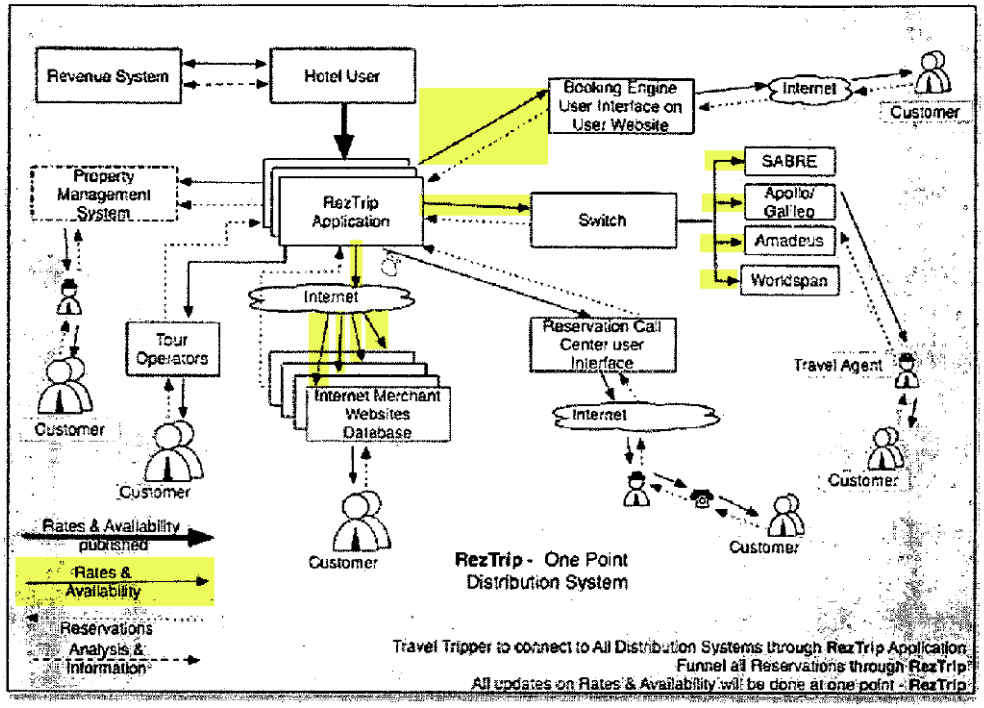
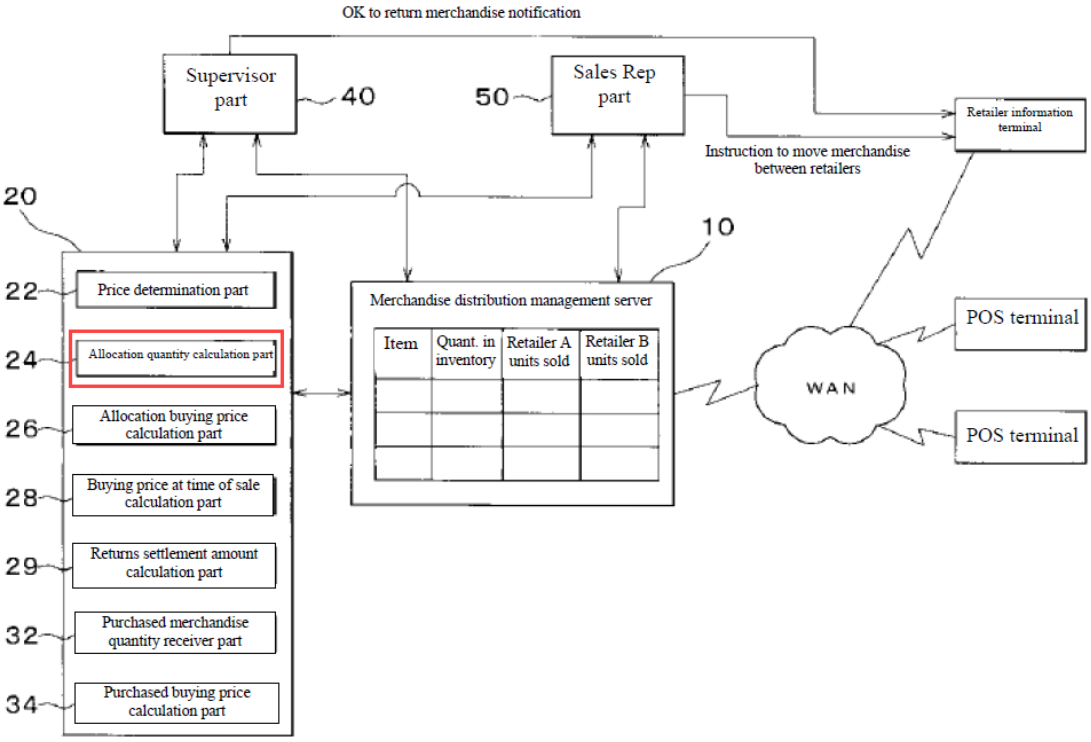


Figure 7

46. Additionally, Tamura similarly disclosed "a sales management system" with multiple retailer channels. Tamura's system includes, *e.g.*, an "allocation calculation part 24 that calculates the ***allocation quantity*** of the [inventory] items" to be allocated to "each retailer." *E.g.*, EX1005 (Tamura), ¶¶[0010],[1] [0013], [0018], cl.1, Fig. 3:

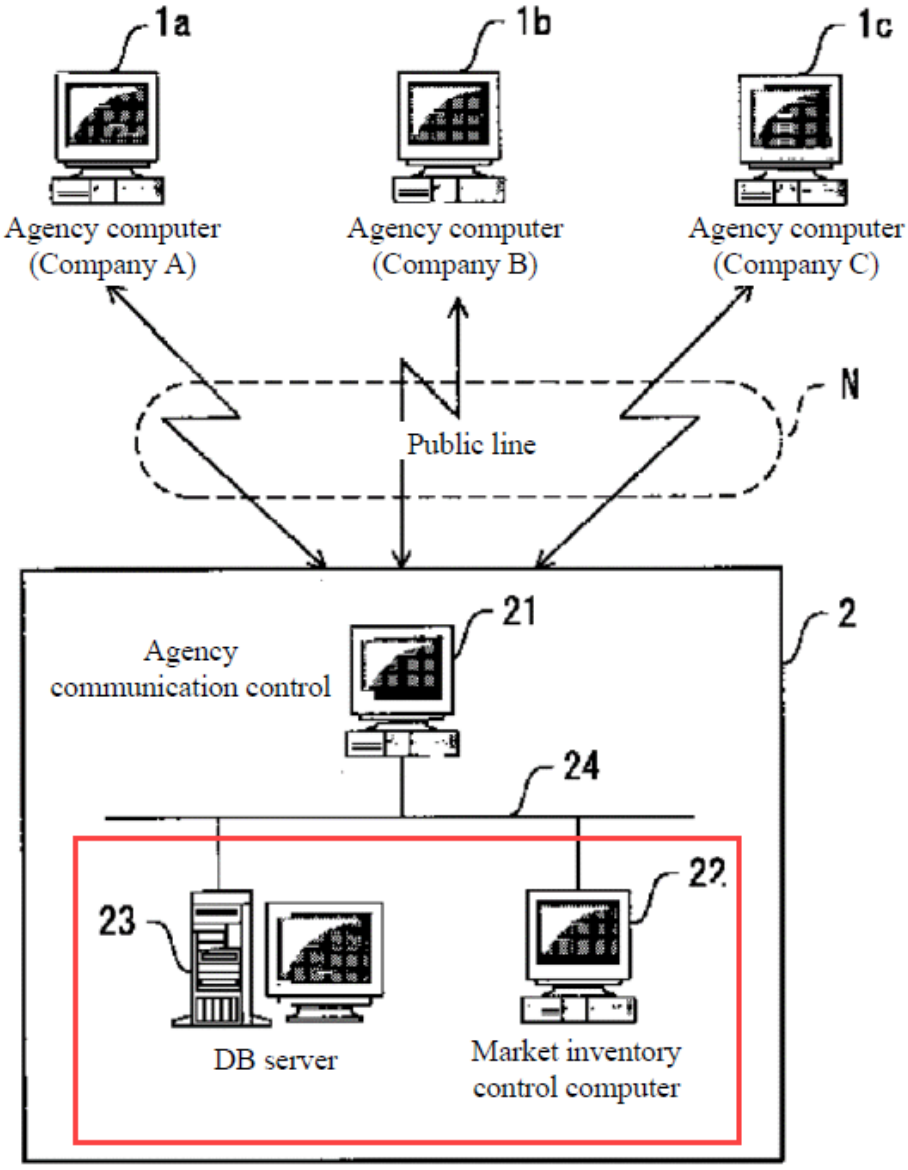
[1] All emphases/annotations are added unless otherwise noted.

Fig. 3

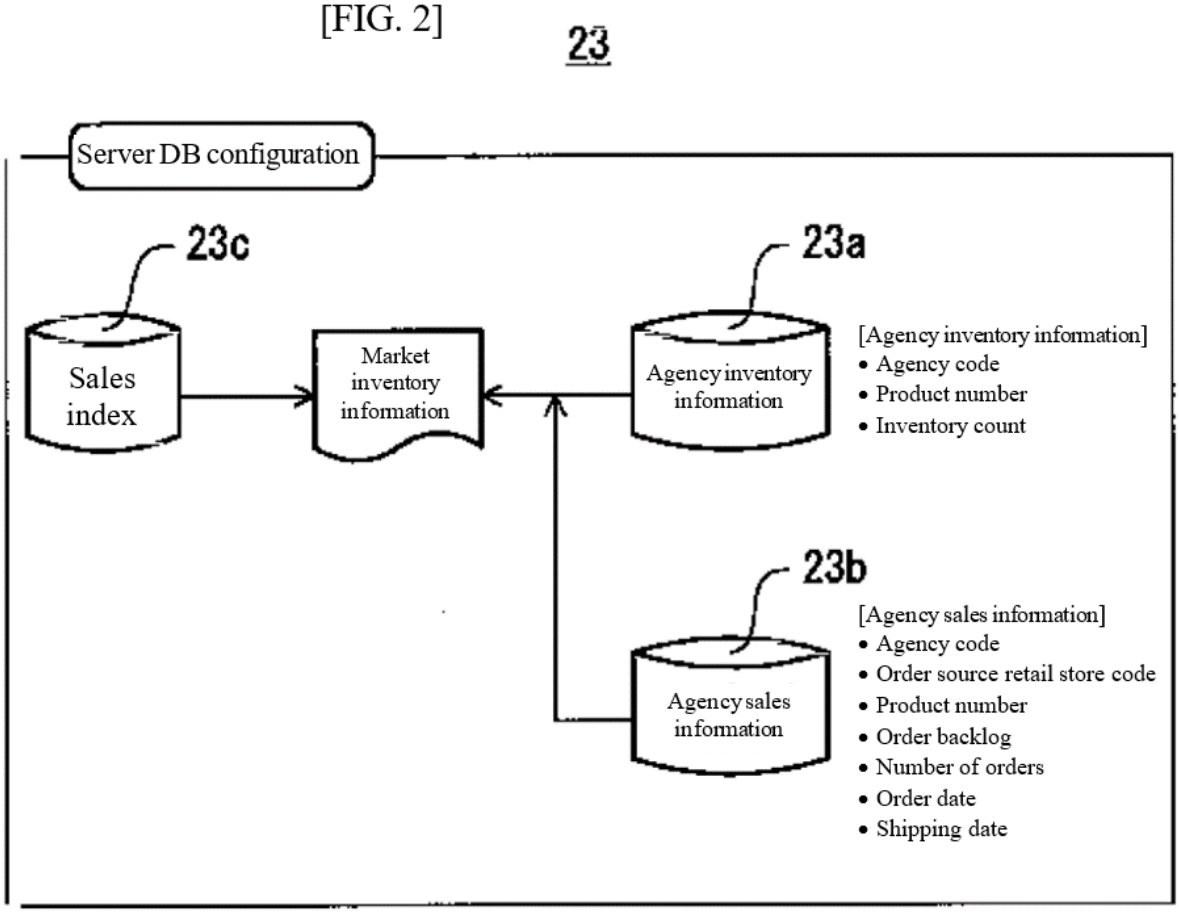

OK to return merchandise notification
Supervisor part
40
50
Sales Rep part
Retailer information terminal
Instruction to move merchandise between retailers
20
10
22
Price determination part
24
Allocation quantity calculation part
26
Allocation buying price calculation part
28
Buying price at time of sale calculation part
29
Returns settlement amount calculation part
32
Purchased merchandise quantity receiver part
34
Purchased buying price calculation part
Merchandise distribution management server
Item
Quant. in inventory
Retailer A units sold
Retailer B units sold
WAN
POS terminal
POS terminal

47. Additionally, Kono disclosed a system with multiple channels, or "agencies," selling inventory and storing the amounts of inventory allocated to and sold by each agency (*e.g.*, each "Inventory Count" and "Shipping Volume" for each "agency"). *E.g.*, EX1007 (Kono), ¶¶[0026], [0042]-[0043], Figs.1, 2, 4:

[FIG. 1]



[FIG. 2]



[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

48. As another example, Evangelist disclosed a "system and method for fulfilling a media request" that "initially allocates inventory," including "on-line inventory" for "distribution through… channels" such as "on-line" channels. *E.g.*, EX1010 (Evangelist), Abstract, 7:29-36, 8:16-23; 9:48-51 ("Controller 100 performs allocation of inventory 110, reallocation of inventory 110, or any suitable function for stores 108 and fulfillment stores 106 for each media title offering in the system 10."), cls.1, 8, 10, 17, 19, 22, Figs.1, 5:

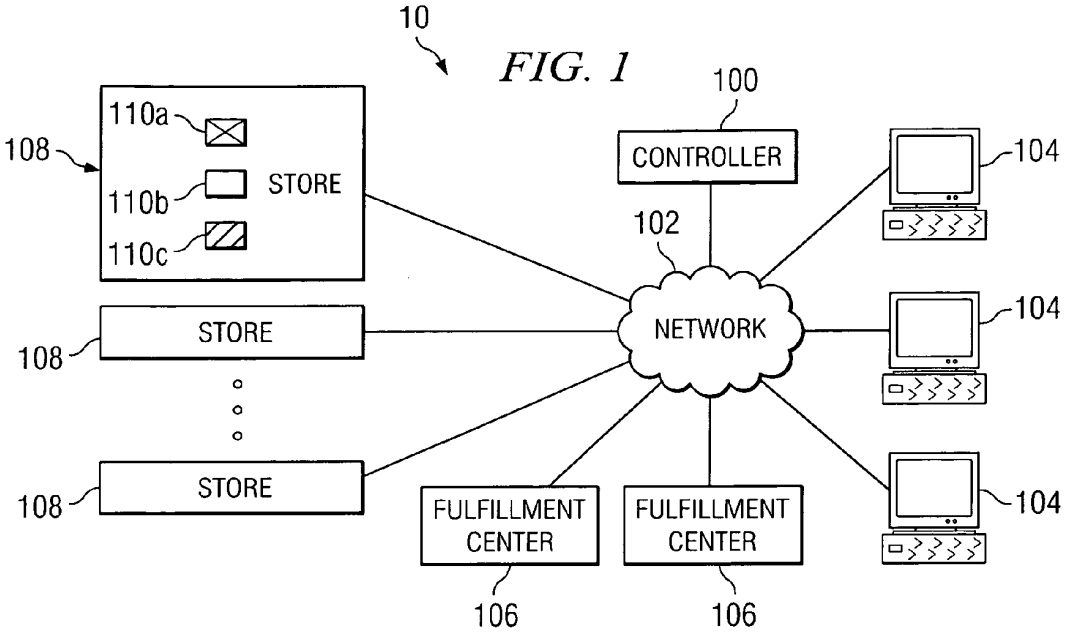
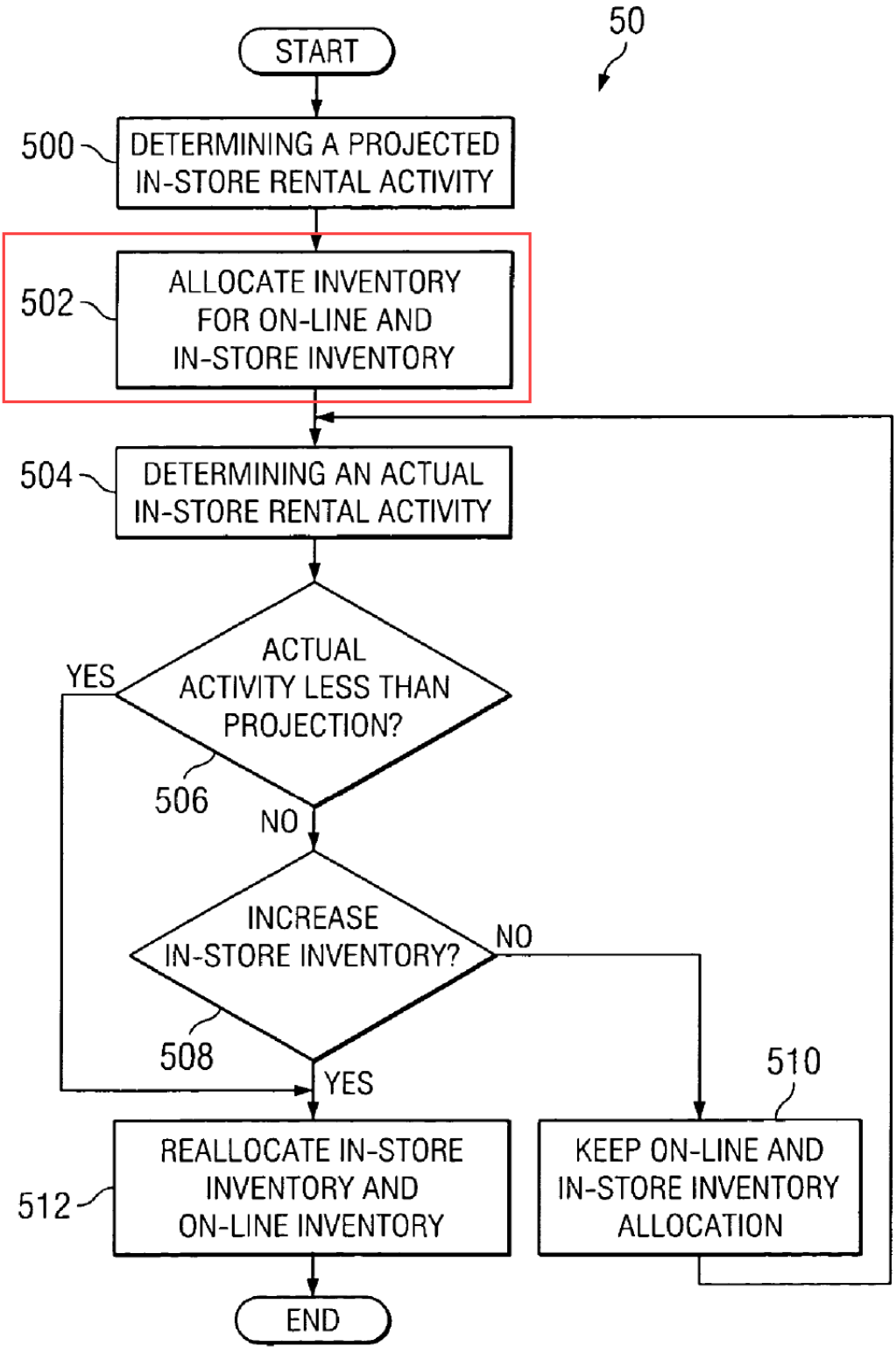


FIG. 5


50
START
500
DETERMINING A PROJECTED IN-STORE RENTAL ACTIVITY
502
ALLOCATE INVENTORY FOR ON-LINE AND IN-STORE INVENTORY
504
DETERMINING AN ACTUAL IN-STORE RENTAL ACTIVITY
ACTUAL ACTIVITY LESS THAN PROJECTION?
YES
506
NO
INCREASE IN-STORE INVENTORY?
NO
508
YES
510
REALLOCATE IN-STORE INVENTORY AND ON-LINE INVENTORY
512
KEEP ON-LINE AND IN-STORE INVENTORY ALLOCATION
END

49. And Phillips similarly disclosed allocating transportation services inventory to different distribution channels, noting that its "revenue management" "techniques can be applied to any situation in which a seller needs to determine how to allocate a fixed supply among different channels or customer segments paying different prices." *E.g.*, EX1029 (Phillips), 120. As Phillips explained:

> Channel pricing is the practice of selling the same product for different prices through different distribution channels. Here are some examples.
>
> • Barnes and Noble sells books for different prices online than through its outlets.
> • Special "Web-only" fares for airline tickets are available through the Internet but not through travel agencies.
> • Many fashion and home furnishing merchants offer lower prices for merchandise through mail-order catalogs than for the same merchandise sold through retail outlets.
>
> As with other price differentiation schemes, there can be more than one reason why a seller might charge different prices through different channels. One is cost—for many companies, selling through the Internet is cheaper than selling through traditional channels. Continental Airlines calculated that distribution costs for a $325 ticket are about $43 when the ticket is sold through a travel agent versus only $18 when the same ticket is sold through Continental's Web site. This difference in itself would be sufficient reason for Continental to charge lower prices on its Web site.
>
> However, it is also the case that customers arriving via different channels have different price sensitivities. For personal loans, it has been shown that customers inquiring through the Internet are more price sensitive than those contacting a call center, who are in turn more price sensitive than those who apply for a loan at a retail branch. Furthermore, Internet customers who access a consolidator Web site or use a shopping 'bot tend to be more price sensitive than those who go directly to a bank's Web site. This is not surprising given the characteristics of the channels—it is generally easier and more convenient

> to shop and compare prices during a single Internet session than by making many phone calls. Thus differential willingness to pay is also a motivation for channel pricing.

EX1029 (Phillips), 79-80, 26 ("The goal of pricing and revenue optimization is to provide the right price • for every product • to every customer segment • through every channel and to update those prices over time in response to changing market conditions.").

50. Another feature— ***establishing, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service***—was also known throughout the art prior to May 18, 2006.

51. For example, Jacob disclosed storing "sales channel data" and "inventory data" showing, *e.g.*, "Rate Type/Room Type" "close[d]" "for certain channels." *E.g.*, EX1004 (Jacob), ¶¶[0085], [0176].

52. In addition, Phillips disclosed that "Some products may not be offered through some channels," (*e.g.*, EX1029 (Phillips), 26), that "[b]oth Southwest Airlines and JetBlue Airways subscribe only to SABRE and do not accept bookings through any other GDS," (*e.g.*, EX1029 (Phillips), 126), and "airlines and hotels can establish fare classes based on the channel of a booking request and ***determine whether or not to provide availability through that channel***," *e.g.*, EX1029

(Phillips), 137-138. Phillips also disclosed "a 'pricing matrix' database specifies which prices are available to which customers through which channels," (*e.g.*, EX1029 (Phillips), 31), and, for example, "[s]pecial 'Web-only' fares for airline tickets are available through the Internet but not through travel agencies," *e.g.*, EX1029 (Phillips), 79.

53. The next feature—***linking the one or more active channel records to the channel interface***—was also well-known long before May 18, 2006.

54. For example, Jacob disclosed making available—for, *e.g.*, updating and editing by, for example, updating "Rates and Availability"—its active channel records stored in, *e.g.*, its "database" that stores "hotel data" including "inventory data," "sales channel data," and "other data." *E.g.*, EX1004 (Jacob), ¶[0083], Figs.7-8:

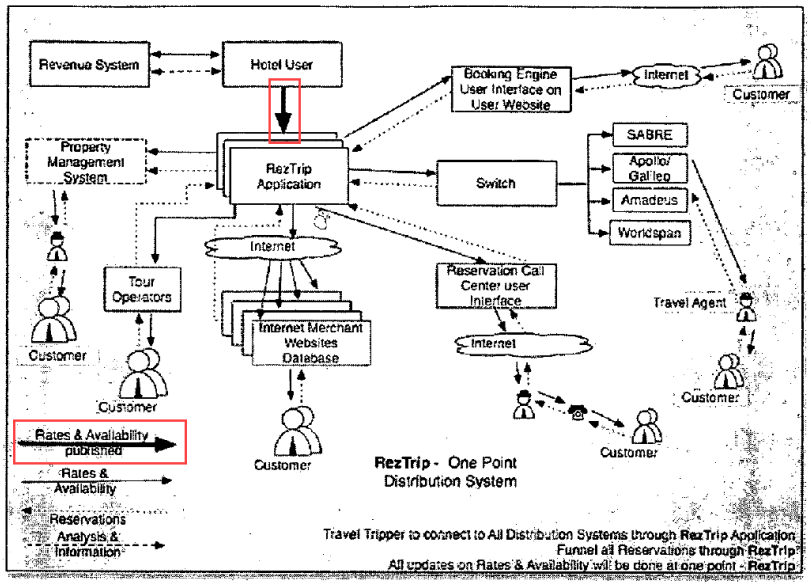


Figure 7

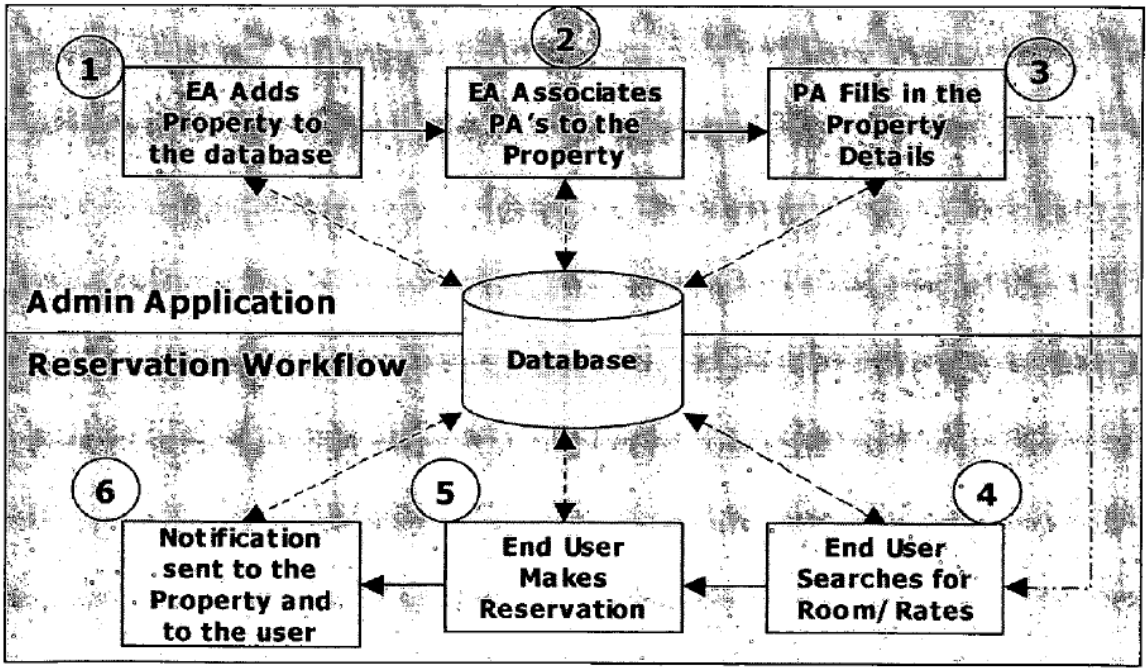


Figure 8

55. Additionally, Kono disclosed that its "maker-side server device 2 checks the sales of each agency by referring to the contents of… form" of, *e.g.*, Figure 4. *E.g.*, EX1007 (Kono), ¶[0043], Fig.4:

[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

56. Another feature—***receiving, in real time for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, sale data corresponding to at least one or more additional vendor computing devices***—was also well-known long before May 18, 2006:

57. For example, Jacob disclosed "information received from the sales channels" (which POSITA would have understood is sent by the sales channels without the need for Jacob's system to request such information) pertaining to online bookings of the transportation services allocated to each of Jacob's channels

(including relating to inventory allocated by Jacob's RezTrip application's multiple "clients"), including, *e.g.*, "reservations" and reservation "confirmation information." *E.g.*, EX1004 (Jacob), ¶¶[0009] ("incoming information"), [0010], [0086], [0192] ("reservation engine data"), Fig. 7. Jacob further underscored as a basic design principle that inventory management systems "should quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time," *e.g.*, EX1004 (Jacob), ¶[0005].

58. As another example, Tamura similarly disclosed that its "merchandise distribution management server 10"—which "executes each step" of Tamura's Figure 2 flowchart—"receives sales information from POS terminals at each retail store" about each sale of an inventory item by these retail store channels: "Each time the item is sold, at each retail store, sales information is transmitted from the POS terminal to the sales management system 20 and the merchandise distribution management server 10." *E.g.*, EX1005 (Tamura), ¶¶[0014] ("server 10 executes each step" including "a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period"), [0017] ("The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period. For example, the server receives sales information from POS terminals at the retail stores…"), cl.5 (computerized method includes, *inter alia*, "recording the

inventory and the number of units sold during [a] unit period for each item of merchandise for sale"); *see also* EX1005 (Tamura), ¶¶[0024]-[0026], Figs.1-3:

Fig. 2

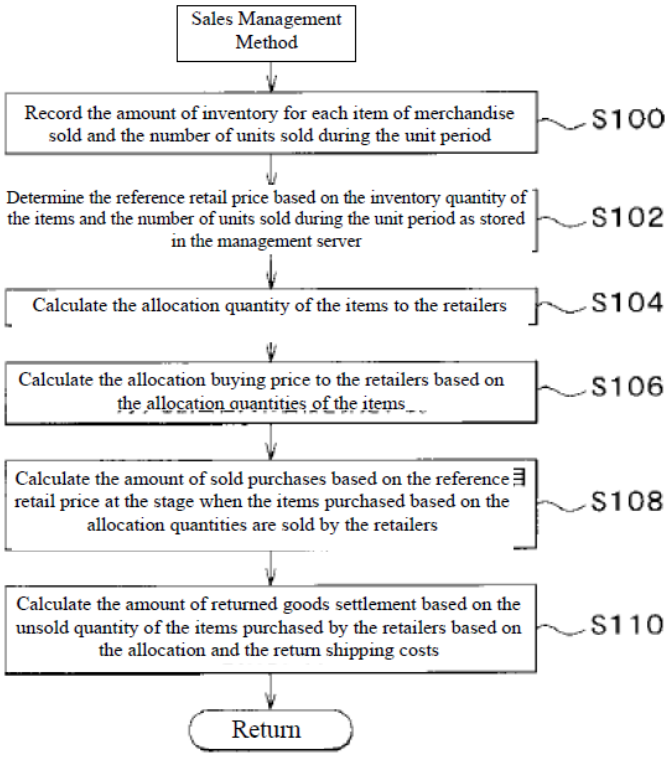
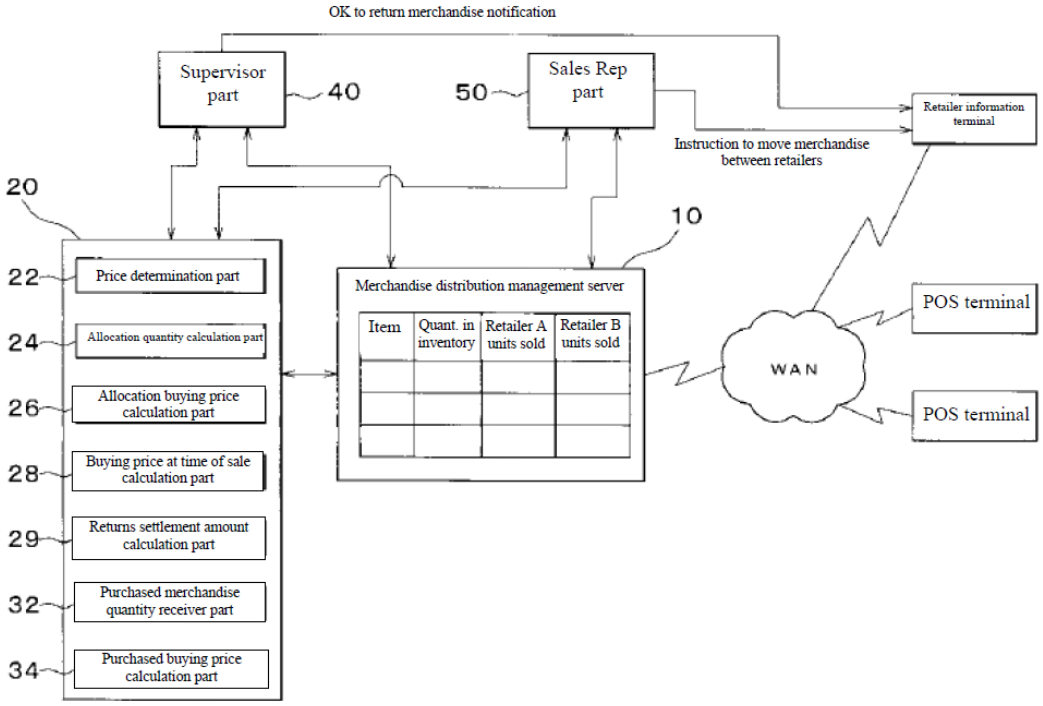


Fig. 3



59. As another example, Kono disclosed that its manufacturer server receives sale data from each of its agency channels in real time over a computerized network—*e.g.*, discussing "acquir[ing] product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time." *E.g.*, EX1007 (Kono), ¶¶[0010], [0014], [0026] ("number of orders"), [0042] ("shipment count for the last month at agencies"), Fig.4 ("Inventory Count," "Shipping Volume").

60. And as a further example, Evangelist similarly disclosed using received sale information to, *e.g.*, keep track of inventory updates—*e.g.*, that "Controller 100 updates inventory information 212 based on fulfilled requests, returned media,

inventory updates and reconciliations, and other communications and activities in system 10." *E.g.*, EX1010 (Evangelist), 5:20-26, Figs.1-2:

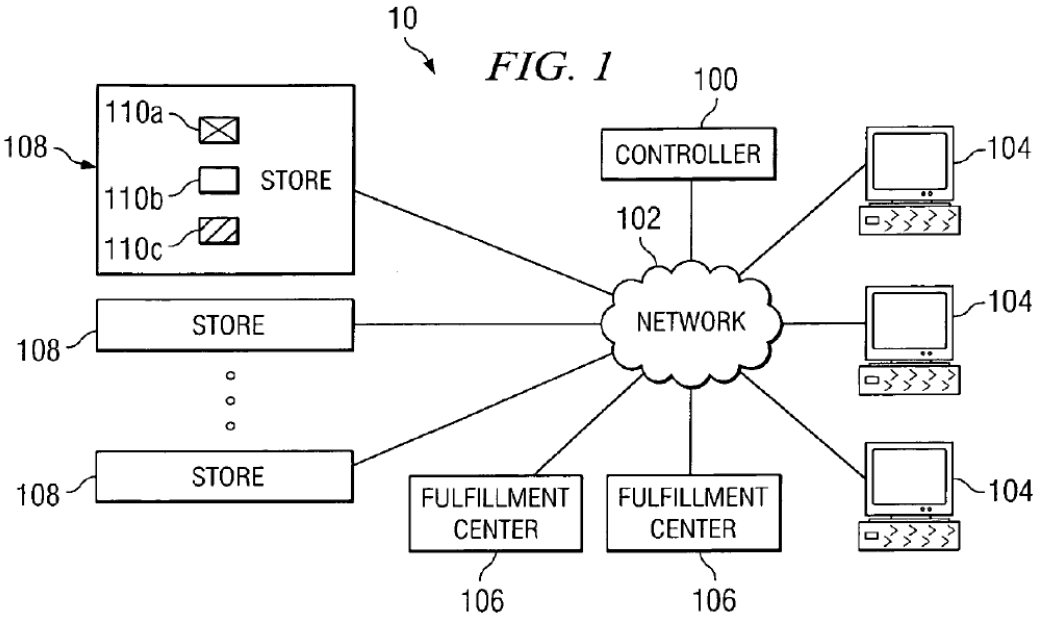
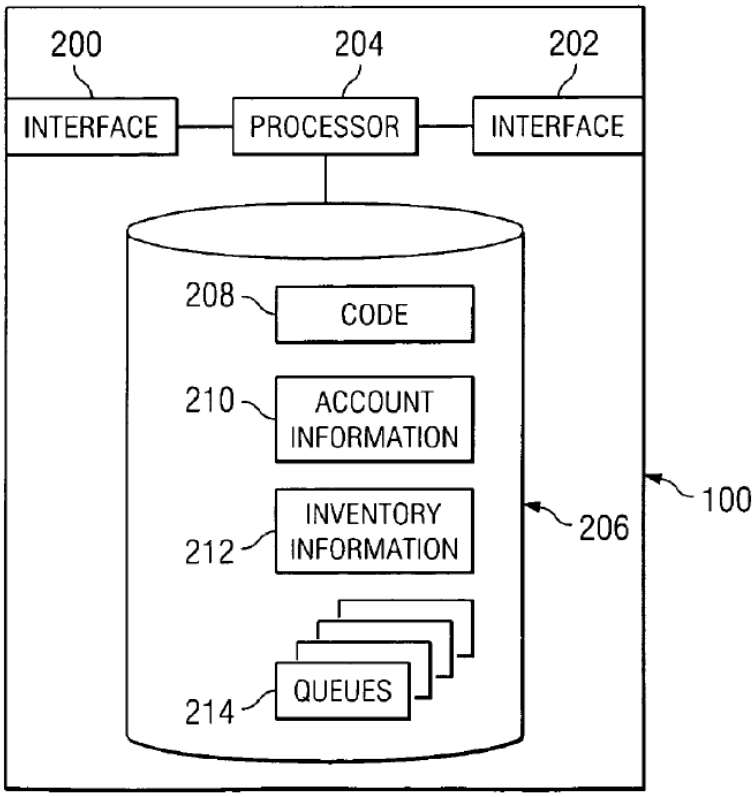


FIG. 2



61. As another example, "Dissemination-Based Information Systems" ("Franklin") (a secondary reference herein), published in September 1996, disclosed various alternative data communication methods, including receiving data via a "*push-based* approach" (including, *e.g.*, "periodic push" and "aperiodic push") from various "data sources," such as from "producers." EX1009 (Franklin), ¶¶[0015] (in "a *push-based* approach… information transfer is initiated by a server push," rather than "by a client pull")(emphasis original), [0016], [0018]. In addition, Franklin disclosed that in a "periodic push" approach, data is received on a "regular, repeating schedule," (*i.e.*, cyclically). EX1009 (Franklin), ¶[0018]. Franklin further disclosed

that its pushed data included data used in, *e.g.*, systems related to vehicle data, such as "traffic information systems," which includes information about "potential delays." EX1009 (Franklin), ¶¶[0002], [0029].

62. As yet another example, Phillips disclosed that "[t]he four most important global distribution systems are AMADEUS, Galileo, SABRE and Worldspan.[] Each GDS distributes schedule, fare, and booking availabilities to the agencies ***and transmits bookings and cancellations from the agencies to the airlines.***" EX1029 (Phillips), 126. Phillips further disclosed the use of real-time communication, including giving examples of ***pushing*** information, such as "*[e]vent driven updates* [that] are triggered by events such as a **booking class closing**, a change in aircraft, and an **unanticipated spike in demand**." *E.g.*, EX1029 (Phillips), 135-36 (italics original). Phillips further disclosed systems capable of matching the industry-specific "cadence" of transactions. *See, e.g.*, EX1029 (Phillips), 123 ("We… turn to a somewhat detailed discussion of booking control—the '**real-time**' face of revenue management"), 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***. Revenue managers review the recommendations of the system on a daily basis. Other companies may update prices weekly or monthly. In any case, the ***core operational activities will be similar***."), 30

("In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations"), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity. As discussed in Chapter 1, the adoption of computerized distribution systems—an early form of e-commerce—by the passenger airlines was a direct contributor to the ability of the airlines to develop, manage, and update highly complex fare structures.[] ***Pricing has a different cadence in every industry***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems,

SABRE and Galileo, were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***. In effect, the airlines were wrestling with the complexities of e-commerce well before the arrival of the Internet. The necessity to continually monitor demand and update prices accordingly will be felt by more and more industries as electronic distribution channels such as the Internet become more pervasive").

63. Another feature—***determining a performance indicator in real time, for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, based at least on the sale***

data corresponding to said at least one or more additional vendor computing devices[2, 3]—was also well-known long before May 18, 2006:

64. For example, Jacob disclosed performing mathematical calculations to compare the sale results at different channels—determining whether, *e.g.*, "a sales channel's" "inventory" is "sold out or is ***selling better than other channels***," "a day within the Rate Type active period is ***selling more quickly*** than other days in the period," and the like—and doing such calculations automatically with its system comprising various "code segments" such as an "analysis code segment," a "revenue enhancement code segment," and a "revenue management code segment… used to analyze the information received from the sales channels, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." *E.g.*, EX1004 (Jacob), ¶¶[0006],

[2] '047 states "'vendor' is used broadly and can be interchanged with 'Property' as that word has been defined earlier" (EX1001 ('047 patent), 31:1-3), and "Property is to be understood as a characteristic of the Rooms that makes comparison between the Rooms meaningful. For example, the rooms could be sourced from a common hotel franchise or from a particular geographical area," EX1001 ('047 patent), 8:19-24. *See also* EX1001 ('047 patent), 28:48-60.

[3] *See also* cl.1[g], [h], below.

[0010], [0131] ("***perform[ing] calculations automatically*** and/or perform[ing] calculations in response to a user initiated triggering event"), [0132], [0133], [0180], Fig. 7.

65. Jacob further disclosed that its "rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly ***depending upon the needs of the Property***. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels***." EX1004 (Jacob), ¶[0185]. Jacob further underscored as a basic design principle that inventory management systems "should quickly distribute updated pricing information, availability information, and other information to the sales channels, ***preferably in real time***." *E.g.*, EX1004 (Jacob), ¶[0005].

66. Similarly, Tamura disclosed mathematically analyzing, *e.g.*, the "***number*** of units sold" and "allocated ***quantity***," yielding a parameter (a performance indicator) reflecting whether a retailer is one "having a ***low sales progress rate***"/is one where "a certain product is ***not selling well***," or, in contrast, has a "***high sales progress rate***," *E.g.*, EX1005 (Tamura), ¶¶[0013] (authorizing transfer of items based on this result), [0035], cl.4, Figs.2-3. (As discussed further below, POSITA would have recognized that examples of "performance ratings"/performance indicators in the '047 patent include parameters that (like

Tamura's low and high sales progress rates, etc.) are "related to a surplus or deficit percentage related to supply and demand or particular inventory items" or "whether or not supply of inventory to each channel… exceeds demand," *e.g.*, EX1001 ('047 patent), 6:46-49, 4:43-47, 6:25-33).

67. Additionally, Kono disclosed its "manufacturer server device" "performs a sales analysis at each agency" that yields a "result" reflecting, for example, "the product whose ***sales on the market have fallen***" for a particular "agency." *E.g.*, EX1007 (Kono), ¶¶[0009]-[0010], [0013] (acting on this resulting parameter: "for the product whose sales on the market have fallen, instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells"), [0014], [0025], cls.1, 3, Figs.2-3.

68. And Evangelist disclosed, *e.g.*, "***determining performance data*** associated with inventory locations that are stores" (*e.g.*, EX1010 (Evangelist), cls.6-7, 15-16, 23) where "performance of stores 108" includes "a maximum number of on-line fulfillments allowed at store 108, accuracy and efficiency in meeting on-line requests, accounting information to credit revenue to store 108 for fulfilling on-line requests, and other similar information." *E.g.*, EX1010 (Evangelist), 5:26-32.

69. As yet another example, Phillips disclosed systems capable of matching the industry-specific "cadence" of transactions. *See, e.g.*, EX1029 (Phillips), 123 ("We… turn to a somewhat detailed discussion of booking control—the '**real-time**'

face of revenue management"), 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***. Revenue managers review the recommendations of the system on a daily basis. Other companies may update prices weekly or monthly. In any case, the ***core operational activities will be similar***."), 30 ("In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations"), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity. As discussed in Chapter 1, the adoption of computerized distribution systems—an early form of e-commerce—by the passenger airlines was a direct contributor to the ability of the airlines to develop, manage, and update highly complex fare structures.[] ***Pricing has a different cadence in every industry***."), 126

("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***. In effect, the airlines were wrestling with the complexities of e-commerce well before the arrival of the Internet. The necessity to continually monitor demand and update prices accordingly will be felt by more and more industries as electronic distribution channels such as the Internet become more pervasive").

70. The next feature—***for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, adjusting, via the channel interface, a price of the transportation service by an adjustment factor depending on whether the performance indicator indicates a performance that either fails to meet or does meet a performance threshold***—was also well-known long before the '047 patent.

71. For example, Jacob disclosed that, "***[i]f*** a sales channel's Room Type inventory is… ***selling better*** than other channels," "***the Rate Type***… for a given date or a series of dates, for certain channels" ***should be "close[d]***." *E.g.*, EX1004 (Jacob), ¶¶[0074] ("As used herein ***Rate Type refers to a class of room rate***"), [0180], cl.13 (disclosing adjusting price "in response to changes in room inventory"—*i.e.*, based on whether a performance indicator indicates a performance that fails to meet a performance threshold (*see* cl.1[h]-[i]), below), Fig.7.

72. Similarly, Tamura disclosed adjusting the reference retail price of the allocated inventory items based on whether a performance indicator indicates a performance that fails to meet or does meet a performance threshold (*see* cl.1[h]-[i], below) (iteratively[4] "determin[ing] the reference retail price for items sold based on the amount of inventory and the number of parts sold during the part period for each item sold") based on determining that a "retailer" had a "high[er] progress rate" than another retailer (*see* cl.1[i]). *E.g.*, EX1005 (Tamura), ¶¶[0019] ("The price determination part 22 ***determines a reference retail price*** for the item ***based on the amount of inventory for each sales item and the number of units sold during the unit period***, as stored in the merchandise distribution management server 10…. The

[4] *See, e.g.*, EX1005 (Tamura), ¶0019 (calculating based on "number of units sold during" a particular "unit period"/"the amount of inventory and sales speed").

reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and with reference to the merchandise's distribution market."), [0025]. As Tamura expressly stated, "if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and ***with reference to the merchandise's distribution market***." *E.g.*, EX1005 (Tamura), ¶[0019]; *see also* EX1005 (Tamura), ¶[0025], cl.1, Figs.2-3.

73. Likewise, U.S. Patent No. 7,894,936 ("Walker"), filed on October 15, 2004, disclosed "a method and apparatus to ***automatically and dynamically determine, adjust and manage product pricing*** in a vending machine to account for current market trends." *E.g.*, EX1011 (Walker), 5:34-37.

74. Phillips further disclosed, *e.g.*, automatically and dynamically adjusting pricing, stating that "[t]he ***goal of pricing and revenue optimization is to provide the right price • for every product*** • to every customer segment • ***through every channel and to update those prices over time in response to changing market conditions***." EX1029 (Phillips), 26, 101 (explaining "the seller could use a combination of allocations and ***price rises*** to manage [an inventory] shortage").

75. Similarly, U.S. Patent No. 8,050,976 ("Staib"), which claims priority to a provisional application filed November 15, 2005, disclosed a system and method for automatically adjusting prices based on information including sale data, in order to, *e.g.*, maximize profits. EX1014 (Staib), 3:57-4:7, 5:33-36; *see also* EX1016 (Staib Provisional Application), 3-4, 6. For example, Staib disclosed "[a] method for setting a price for a product sold online by a subject merchant and listed on at least one channel with other offerings of the same product by other merchants" in which the "system uses available data, multiple algorithms and user input rules to ***compute new, adjusted prices that match merchants' varying sales goals, such as maximizing profits***…." *E.g.*, EX1014 (Staib), 3:57-4:7, 5:33-36; *see also* EX1016 (Staib Provisional Application), 3-4, 6.

76. And U.S. Patent No. 8,051,015 ("Veit"), which was filed on July 28, 2004, disclosed "a method, program product and system for automated control of pricing of a product or service" including "determining an initial price of the product,

monitoring actual sales of the product at retail outlets, and ***adjusting the initial price… based on the actuals sales*** of the product." *E.g.*, EX1015 (Veit), 2:15-22.

77. The '047 patent also discloses that processors, non-transitory computer-readable storage media, computers, servers, networks, and databases/data structures for storing information were already well-known. For example, the '047 patent expressly states that databases were already "commonly known in the art": "As is commonly known in the art, a relational database is a collection of data items organized as a set of formally-described tables in which data is structured to recognize relations between stored data entries and that can be accessed or reassembled in many different ways without having to reorganize the database tables." *E.g.*, EX1001 ('047 patent), 32:46-52; *see also e.g.*, EX1001 ('047 patent), 8:4-5 ("As is generally known, tables are represented within computer systems as relational databases."), 10:62-64 ("It will be appreciated by those of ordinary skill in the field that an Excel spreadsheet is effectively a relational database."), 32:29-31 ("relational database fields" are "shown as entries or records in spreadsheets, for example, Excel spreadsheets"), 32:1-4 ("statistical assessment" to "be carried out with a suitable application such as *that known as a genetic or self-learning algorithm*"); *see also, e.g.*, EX1004 (Jacob), ¶¶[0082] ("Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention."), [0083] ("Embodiments of the

invention are configured to run on general purpose computers."); EX1010 (Evangelist), 4:9-18, 4:36-61 ("Processor 204 controls the operation and administration of controller 100."); EX1011 (Walker), 3:34-42 ("the various methods and algorithms described herein may be implemented by, e.g., appropriately programmed general purpose computers and computing devices"), 3:55-4:17 ("The term 'computer-readable medium' as used herein refers to any medium that participates in providing data (e.g., instructions) which may be read by a computer, a processor or a like device.").

78. The '047 patent also explains that in an exemplary embodiment, it uses generic hardware known to POSITA that the applicants did not purport to have invented—the "system 10 includes a data processing apparatus in the form of a computer 12 that is connectable to a network" such as "the Internet" or "a private network," EX1001 ('047 patent), 3:64-67, that a "computer" is "any apparatus capable of carrying out data processing functions," *e.g.*, EX1001 ('047 patent), 37:58-62, and that a "server" "is a computer or other data processing apparatus that is capable of carrying out server-side operations," *e.g.*, EX1001 ('047 patent), 38:4-5.

VI. THE '047 PATENT

A. Overview of the '047 patent

79. The '047 patent states that it relates to a "method of managing online bookings for transportation services inventory." EX1001 ('047 patent), Abstract. The "General Background" section of the '047 patent states that "[a] particular problem exists when selling inventory, such as travel services including accommodation allotments, flights and other transport services. The problem is a result of the manner in which such inventory is allocated to various re-sellers, referred to as distribution channels ("Channels"), which can be ad hoc and thus inefficient. The particular problem is that the market has forced vendors to commit physical inventory to particular Channels in a relatively ad hoc manner." EX1001 ('047 patent), 1:30-38.

80. '047 further explains that, "[w]hile this invention is intended to cover a wide variety of inventory-types, the travel and accommodation industries, in particular, would benefit greatly from efficient allocations of inventory to various Channels." EX1001, ('047 patent), 3:44-47.

81. The claims of the '047 patent generally require establishing a channel interface that provides bidirectional communication between a server computing device and vendor computing device, storing a channel record for each of a plurality of distribution channels, receiving from the vendor computing device a selection

from the distribution channels of at least one participant channel for a transportation service, establishing at least one active and one inactive channel record based upon the participant and non-participant channels for the transportation service, respectively, linking the active channel records to the channel interface, receiving in real time for the participant channels corresponding to the active channel records sale data corresponding to at least one additional vendor computing device, determining a performance indicator based on the sale data, and adjusting the price of transportation services for each participant channel by an adjustment factor if the performance indicators shows a failure to meet a performance threshold. E.g., EX1001 ('047 patent), 1:50-2:21.

82. The '047 patent states that "distribution channels" are, for example, "re-sellers stored on servers." *E.g.*, EX1001 ('047 patent), 4:4-8.

83. The '047 patent further states that "processing sale data" can, for example, "comprise[] determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel." *E.g.*, EX1001 ('047 patent), cl.2.

84. The '047 patent also explains that "performance rating" "can be in the form of a number of parameters. For example, it could be related to a surplus or deficit percentage related to supply and demand of particular inventory items." EX1001 ('047 patent), 6:46-49; *see also* EX1001 ('047 patent), 4:43-47

("determination of whether or not supply of inventory to each channel 18 exceeds demand"), 6:25-33.

85. Figure 1 of the '047 patent "illustrates an exemplary embodiment of a system for managing inventory allocated to respective re-sellers":

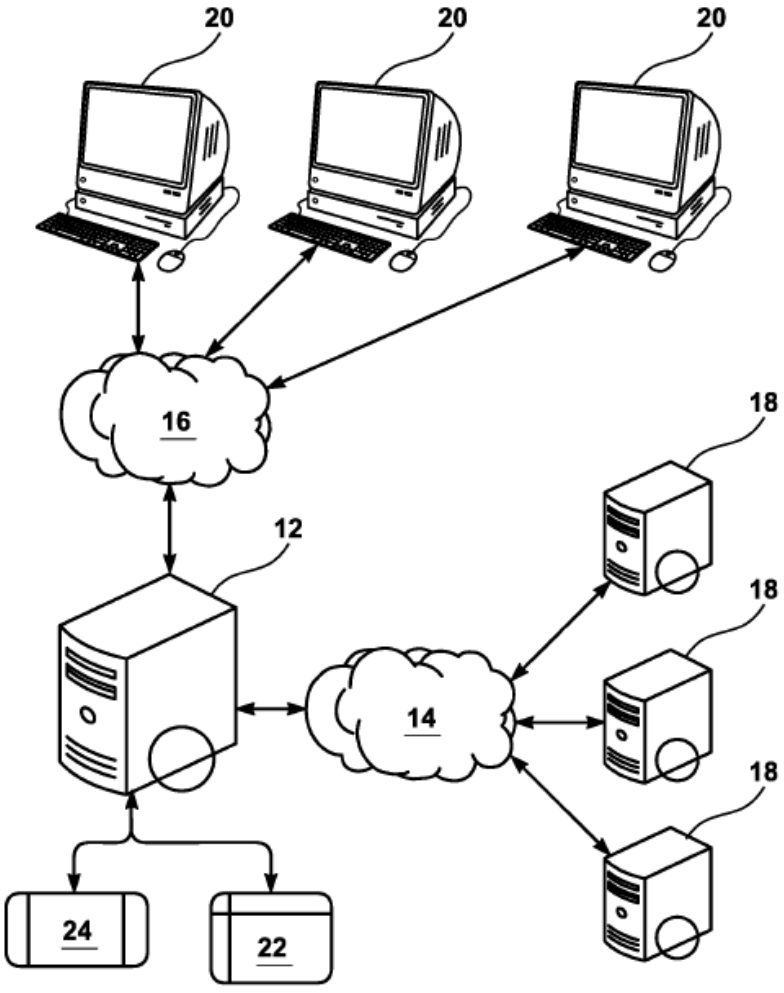


FIG. 1

E.g., EX1001 ('047 patent), Fig. 1.

86. As described herein, however, and in my opinion, systems for managing inventory, including computer-implemented systems for managing online bookings for transportation services inventory, were well-known before May 18, 2006.

87. I have considered the Challenged Claims (claims 1-6) of the '047 patent, which are as follows:

> **1[pre]** A computer-implemented method of managing online bookings for transportation services inventory, the computer-implemented method comprising:
> **1[a]** establishing a channel interface that provides bidirectional communication between at least one server computing device and a vendor computing device;
> **1[b]** storing, via a channel data structure, a channel record for each of a plurality of distribution channels;
> **1[c]** receiving, from the vendor computing device through the channel interface, a selection, from the plurality of distribution channels, of one or more participant channels for a transportation service;
> **1[d]** establishing, via the channel data structure, one or more active channel records based upon the one or more participant channels for the transportation service;
> **1[e]** establishing, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service;

1[f] linking the one or more active channel records to the channel interface;

1[g] receiving, in real time for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, sale data corresponding to at least one or more additional vendor computing devices;

1[h] determining a performance indicator in real time, for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, based at least on the sale data corresponding to said at least one or more additional vendor computing devices;

1[i] and for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold.

2 The computer-implemented method of claim 1, wherein the processing the sale data comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel.

3 The computer-implemented method of claim 1, wherein the one or more active channel records are linked to the channel interface without the one or more inactive channel records.

4[pre] A computer-implemented method of managing online bookings for transportation services inventory, the computer-implemented method comprising:

4[a] establishing a channel interface that provides bidirectional communication between at least one server computing device and a vendor computing device;

4[b] storing, via a channel data structure, a channel record for each of a plurality of distribution channels;

4[c] receiving, from the vendor computing device through the channel interface, a selection, from the plurality of distribution channels, of one or more participant channels for a transportation service;

4[d] establishing, via the channel data structure, one or more active channel records based upon the one or more participant channels for the transportation service;

4[e] establishing, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service;

4[f] linking the one or more active channel records to the channel interface;

4[g] receiving, in real time for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, sale data corresponding to at least one or more additional vendor computing devices;

4[h] determining a performance indicator in real time, for each of the one or more participant channels corresponding to the one or more

active channel records linked to the channel interface, based at least on the sale data corresponding to said at least one or more additional vendor computing devices;

4[i] and for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that meets a performance threshold.

5 The computer-implemented method of claim 4, wherein the processing the sale data comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel.

6 The computer-implemented method of claim 4, wherein the one or more active channel records are linked to the channel interface without the one or more inactive channel records.

B. Overview of the ’047 patent Prosecution History

88. The application (17/749,091) that led to the ’047 patent was filed on May 19, 2022 (EX1002 (File History), 374), and claims priority to AU 2006902685, filed May 18, 2006. *See* EX1002 (File History), 380. The Examiner considering the application (17/749,091) leading to ’047 issued one non-final action, rejecting all claims (1-12) for non-statutory double patenting. EX1002, 500-506. In response,

Applicant submitted a terminal disclaimer. EX1002, 531-533, 536-537, 540. The Examiner then allowed the claims. EX1002, 552, 556-558.

C. Claim Construction of the '047 patent Claims

89. I have been advised that claim terms are generally given their plain and ordinary meaning in light of the specification. I further understand that the plain and ordinary meaning may not apply where a patentee acts as his own lexicographer and sets out a definition for the term or where the patentee disavows the full scope of the claim term either in the specification or during prosecution.

90. I have been asked to assume constructions for certain claim terms as presented in the following table.

Term	Assumed Construction
"receiving, in real time" (All Challenged Claims)	receiving most recent data by "push" method

91. I have been asked to apply the construction listed above for purposes of this proceeding. I offer no opinion herein on the merits of the claim construction, but I reserve the right to do so in the future. For the claim term listed above, it is my opinion that the limitations of the Challenged Claims are met under the construction in view of the references cited and the knowledge of POSITA, as explained in this declaration. For all terms not specifically listed above, I have been asked to assume that they have their plain and ordinary meaning in light of the specification.

VII. THE CHALLENGED CLAIMS ARE INVALID

A. Legal Standards

92. I understand that a patent claim may be invalid under 35 U.S.C. § 103(a) if the differences between the claimed invention and the prior art are such that the claimed invention, as a whole, would have been obvious to a person of ordinary skill in the art in view of a prior art reference or combination of prior art references before the earliest filing date of the claimed invention.

93. I understand that obviousness is determined from the perspective of person of ordinary skill in the art and that the asserted claims of the patent should be read from the point of view of such a person at the time the claimed invention was made. Additionally, I understand that a person of ordinary skill in the art is assumed to know and to have read all relevant prior art in the field of endeavor covered by the patent in suit or reasonably pertinent to the particular problem faced by the inventor.

94. Additionally, I understand that prior art used in an obviousness analysis must be analogous—and that there are two criteria for determining whether prior art is analogous and thus would be assumed to be known to a person of ordinary skill in the art: *first*, whether the art is from the same field of endeavor as the invention, regardless of the problem addressed, and *second*, if the reference is not within the

same field of endeavor as the invention, whether the reference still is reasonably pertinent to the particular problem with which the inventor was faced.

95. I further understand that the field of endeavor of a patent is not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field. I also understand that a reference is reasonably pertinent if, even though it is in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering the problem.

96. I understand that an analysis of whether a claimed invention would have been obvious should be considered in view of (i) the scope and content of the prior art, (ii) any differences between the prior art and the claimed invention, (iii) the level of ordinary skill in the relevant art, and (iv) secondary considerations of non-obviousness. I also understand that a prior art reference should be viewed as a whole.

97. I also understand that in considering whether an invention would have been obvious, one may consider whether there are apparent reasons to combine known elements in the prior art in the manner claimed in view of interrelated teachings of multiple prior art references, the effects of demands known to the design community or present in the marketplace, and/or the background knowledge possessed by a person of ordinary skill in the art. I understand that other principles

may be relied on to determine whether a claimed invention would have been obvious, and that they include the following:

- Combining prior art elements according known methods is likely to be obvious when it does no more than yield predictable results;
- When a device or technology is available in one field of endeavor, design incentives and other market forces can prompt variations of such device or technology, either in the same field or in a different field, so that if a person of ordinary skill in the art can implement a predictable variation, that variation is likely obvious;
- If it would have been recognized by a person of ordinary skill in the art that applying a known technique, which has been used to improve one device, method or product, would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond the skill of a person of ordinary skill in the art;
- An explicit or implicit teaching, suggestion, or motivation to combine two prior art references to form the claimed invention may demonstrate obviousness, but proof of obviousness does not depend on or require showing such a teaching, suggestion, or motivation to combine in the prior art;

- Market demand, rather than scientific literature, can drive design trends and may show obviousness;
- In determining whether the subject matter of a patent claim would have been obvious, neither the particular motivation nor the stated purpose of the named inventor controls;
- One of the ways a claimed invention can be shown to have been obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by claims of the patent;
- Any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed;
- Common sense teaches that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle;
- A person of ordinary skill in the art is also a person of ordinary creativity, and is not an automaton;
- A patent claim can be proved obvious by showing that the claimed combination of elements was "obvious to try," when, for example, there is a design need or market pressure to solve a problem and there are a finite number of

identified, predictable solutions such that a person of ordinary skill in the art would have had good reason to pursue the known options within her technical grasp; and

- An obviousness analysis must be based on what was known at the time of the invention and it is impermissible to use hindsight in evaluating whether a claimed invention would have been obvious.

98. I understand that a prior art reference can disclose a claimed feature either because that feature is expressly described in the prior art reference, or because that feature is inherent in the disclosure of the prior art reference. I understand that something is inherent in a prior art reference only if the missing descriptive matter must necessarily be present. I also understand that inherency cannot be established by probabilities or possibilities, and the mere fact that something may result from a given set of circumstances is not enough for inherency.

99. I further understand that, in making a determination as to whether or not the claimed invention would have been obvious to a person of ordinary skill, one may consider certain objective factors if they are present, including whether there was a long-felt but unsolved need, whether there was commercial success (for example, the profitability of the claimed method or device practicing the claims), any teaching away (*e.g.*, patents or other literature telling a person of ordinary skill

in the art not to do something that the claims require), any unexpected results, copying, and praise by others in the field. These factors are generally referred to as "secondary considerations" of non-obviousness or "objective indicia" of non-obviousness. I understand, however, that for any such objective evidence to be relevant to the obviousness of a claim, there must be a causal relationship (known as "nexus") between the claim and the evidence of secondary considerations, and that this nexus must be based on a novel element of the claim rather than an element that is in the prior art. I also understand that even when present, secondary considerations of non-obviousness may be unable to overcome primary evidence of obviousness (for example, motivation to combine and predictable results) that is sufficiently strong.

100. I also understand that, for a patent to be obvious, a person of ordinary skill in the art must have had (in addition to a motivation to combine) a reasonable expectation of success in practicing the claimed invention based on the prior art. Whether a skilled artisan would have had a reasonable expectation of is determined based on the degree of unpredictability in the art as well as the guidance provided by the art.

101. I have been asked to consider the validity of the challenged claims. I understand that in an *inter partes* review, invalidity (also referred to as "unpatentability") must be shown by a preponderance of the evidence. I understand

that to establish something by a preponderance of the evidence, it must be shown that it is more likely true than not true.

102. I understand that a dependent claim (challenged claims 2-8, 10-16, and 18-20 of the '047 patent) contains all of the limitations of the independent claim from which it depends (as well as any limitations of any dependent claim from which another dependent claim depends), in addition to the additional limitations recited in the dependent claim language itself.

103. As discussed herein, I have concluded that each of the Challenged Claims is obvious and thus invalid (and unpatentable) at least under 35 U.S.C. § 103 for obviousness based on the references described below and as outlined in the claim charts attached hereto as Appendix C.

B. Ground 1: Claims 1-6 Are Obvious Over Jacob in view of Phillips; Ground 2: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Evangelist; Ground 3: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Franklin; Ground 4: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, and Franklin; Ground 5: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Tamura; Ground 6: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, and Tamura; Ground 7: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Franklin, and Tamura; Ground 8: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Franklin, and Tamura; Ground 9: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Tamura, and Kono; Ground 10: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Tamura, and Kono; Ground 11: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Franklin, Tamura, and Kono; Ground 12: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

104. It is my opinion, for the reasons discussed above, below, and in the claim charts included as Appendix C, which form part of my analysis and my declaration, POSITA would recognize that each and every limitation of claims 1-20 of the '047 patent, combined as claimed, is disclosed or suggested by the prior art such that each claim would have been obvious to POSITA. Specifically, it is my opinion that **Ground 1**: Claims 1-6 Are Obvious Over Jacob in view of Phillips; **Ground 2**: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Evangelist; **Ground 3**: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Franklin; **Ground 4**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, and Franklin; **Ground 5**: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Tamura; **Ground 6**: Claims 1-6 Are Obvious Over Jacob in view of Phillips,

Evangelist, and Tamura; **Ground 7**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Franklin, and Tamura; **Ground 8**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Franklin, and Tamura; **Ground 9**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Tamura, and Kono; **Ground 10**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Tamura, and Kono; **Ground 11**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Franklin, Tamura, and Kono; **Ground 12**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

1. Overview of "Hotel Inventory Management System and Method"—U.S. Patent Pub. No. 2007/0075136 ("Jacob")

105. Jacob (EX1004) is a U.S. Patent Publication that was filed on September 26, 2005, and that published on April 5, 2007. I understand that Jacob is prior art to the '047 patent. Jacob is entitled "Hotel Inventory Management System and Method," and describes, among other things, a "system and method for managing time-dependent inventory such as hotel rooms, rental automobiles, and airline seats as well as associated items." *E.g.*, EX1004 (Jacob), Abstract.

106. Jacob discloses, for example, "computer program systems," including "a series of code segments," that "comprise a system to manage the sales, pricing, and inventory information related to time-dependent items." *E.g.*, EX1004 (Jacob), ¶[0006].

107. Jacob further explains that "[e]mbodiments" of the system "may be implemented in computer software, computer hardware, or combinations of computer hardware and software," (*e.g.*, EX1004 (Jacob), ¶[0082]), and that "[e]mbodiments of the invention are configured to run on general purpose computers," *e.g.*, EX1004 (Jacob), ¶[0083].

108. Jacob discloses that its system further comprises a "computerized database… configured to manage hotel data comprising," among other things, "property data, room type data, rate type data," "inventory data," "pricing data," "availability data," "date data," "sales channel data, "communications data, and other data." *E.g.*, EX1004 (Jacob), ¶[0084].

109. Jacob further discloses that its system, running, for example, the "RezTrip Application," "may be configured to communicate with the hotel staff, the hotel property management database, and a plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™, telephone reservation systems, a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems, and tour operators. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels." EX1004 (Jacob), ¶¶[0007], [0085] ("the RezTrip™ system communicates with the hotel user, the

hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website."); *see also* EX1004 (Jacob), ¶¶[0077]-[0078], Fig.7 (annotations added):

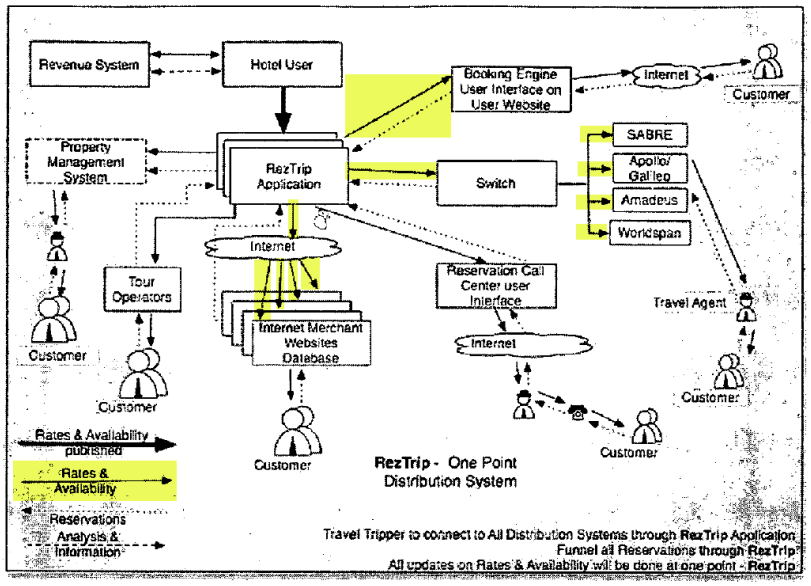


Figure 7

110. As shown in Figure 7, above, Jacob's system provides "Rates and Availability" to each individual sales channel, and receives from each channel "Reservations" when, *e.g.*, end users book a room at a property. *E.g.*,EX1004 (Jacob), Fig.7.

111. Jacob discloses that its system allows users to, for example, administer time-dependent inventory by configuring pricing and inventory information and sending such information to sales channels: "Once the Rate Types, Room Types, and inventory have been managed… the pricing information, inventory information,

and other information is communicated to the selling channels" by the "communications code segment," which is "configured to communicate with at least one sales channel, and/or a plurality of sales channels." *E.g.*, EX1004 (Jacob), ¶[0191]; *see also* EX1004 (Jacob), ¶¶[0007], [0066].

112. Jacob further explains that information (such as pricing and inventory information) may be "communicated to the selling channels in response to a triggering event," and that "[a] triggering event may be initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click." *E.g.*, EX1004 (Jacob), ¶[0191]. As one of its implementation alternatives, Jacob discloses that its system can "be configured to perform calculations automatically," (*e.g.*, EX1004 (Jacob), ¶[0132]), and that "in response to a triggering event" "updated pricing and availability inf[o]rmation may be sent to selling channels electronically over wired or wireless networks, such as the internet," *e.g.*, EX1004 (Jacob), ¶[0191]. *See also* EX1004 (Jacob), cl.5 ("comprising a code segment configured to communicate pricing information and inventory information to a plurality of sales channels"), cl.6 ("code segment to automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event"), cls.11-13, 19, 24-25.

113. Jacob further discloses that, "[i]n addition to distributing information to the sales channels," the system, *e.g.*, "accept[s] reservations" and that "incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations." *E.g.*, EX1004 (Jacob), ¶[0009].

114. Jacob also discloses that its system comprises a "revenue management code segment" which is "used to analyze the information received from sales channels" in order to "maximize hotel revenue." *E.g.*, EX1004 (Jacob), ¶[0010]. For example, Jacob explains that "[i]f a sales channel's Room Type inventory is selling better than other channels," inventory can be "reallocate[ed]… to the better selling channel," or, e.g., "the Rate Type/Room Type, for a given date or a series of dates, for certain channels" can be "closed." *E.g.*, EX1004 (Jacob), ¶[0180]; *see also* EX1004 (Jacob), ¶[0176], Fig. 40 (showing "Change Allotment" as to "Rate Type"):

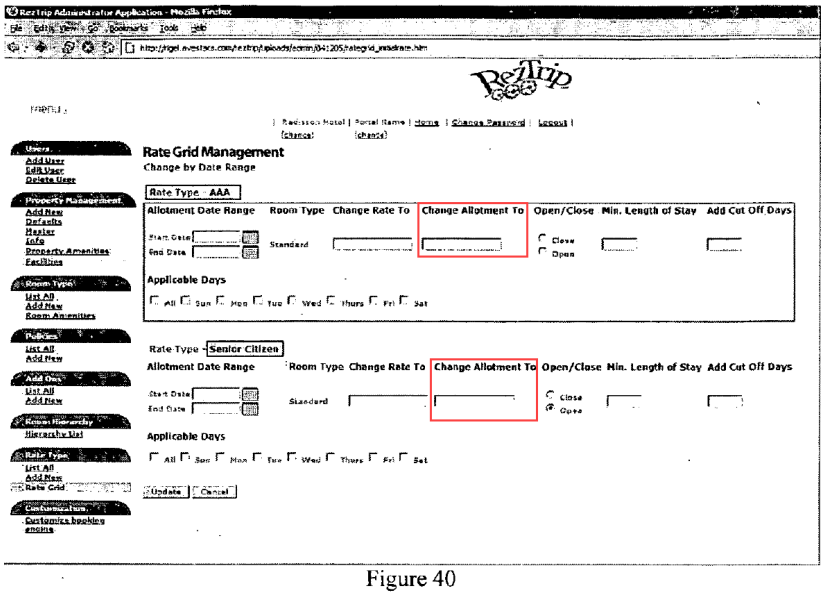


Figure 40

115. Jacob also discloses that its "rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels." EX1004 (Jacob), ¶[0185].

2. Overview of "Pricing and Revenue Optimization" ("Phillips")

116. I understand Phillips is prior art to the '047 patent. I became aware of Phillips shortly after it published in 2005, when it quickly became a well-known reference in my field (including to POSITA) that those in my field could readily acquire by purchase or from a library well before May 2006. EX1029; EX1031; EX1032. On March 21, 2023, I retrieved and reviewed a copy of the book I became aware of in 2005 from my university library, and mailed it to Groombridge, Wu,

Baughman & Stone LLP. Excerpts of that book appear as EX1029. Indeed, in the early 1990's the field of revenue/yield management was emerging as one of the most exciting applications of operations research and was frequently discussed in my field (including by POSITA). Additionally, my own work in airline capacity management and long- and short-term contracting in trucking operations began well before Phillips's publication in 2005, and Phillips was often used (including by POSITA) in this field. Phillips discloses the basic economics underlying pricing decisions (*e.g.*, "how companies should set and adjust their prices in order to maximize profitability," including the history "of pricing and revenue optimization" using "analytical techniques derived from management science" since "the 1980s"), and disclosed "[c]omputerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented." EX1029 (Phillips), 1, 15, 121-23, 125-126. Phillips describes "computerized revenue management systems" and explains that they allow automatic updating and "solve the underlying optimization problem." EX1029 (Phillips), 30 ("Analyze alternatives… Historically… involved analysts' use of spreadsheets…. More recently it has involved the use of ***software systems that solve the underlying optimization problem*** to recommend new prices for every element of the PRO cube."; "Choose the best alternative… In very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with

analysts only investigating the unusual or unexpected situations."), 33 ("At this point, ***most companies consider adopting some sort of computerized pricing support system***."), 121 ("***Computerized reservation systems*** and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("***computerized revenue management systems***") 134-135 ("Revenue management systems. The primary job of a revenue management system is to calculate and update the booking limits within the reservation system… receives a feed of bookings and cancellations from the reservations system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems."), 141 ("Every major airline, ***hotel***, rental car company, or cruise line has a revenue management department or a revenue management function. These departments rely on ***computerized systems*** to recommend actions based on sophisticated mathematical algorithms.").

3. Overview of "Sales Management System and Method"—Japanese Unexamined Patent Application Publication No. JP 2005-332346 ("Tamura")

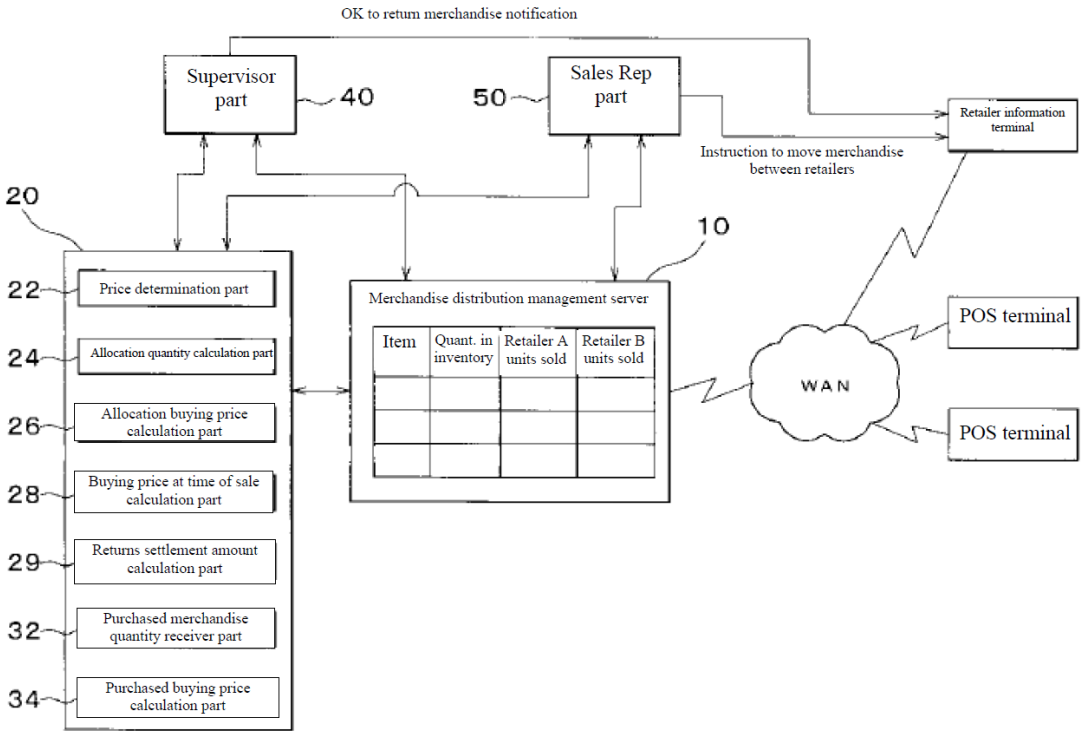
117. I understand that Tamura (EX1005) is a certified English translation of a Japanese Patent Application Publication (EX1006) that was filed on May 21, 2004, and published on December 2, 2005. I understand that Tamura is prior art to the '047 patent. Tamura describes "a sales management system" that, *e.g.*, "reduces the risk

of bad inventory for retailers of apparel and other merchandise while reducing lost sales opportunities." *E.g.*, EX1005 (Tamura), ¶[0009].

118. To accomplish this goal, Tamura "determines the reference retail price for items sold based on the amount of inventory and the number of parts sold during the part period for each item sold." EX1005 (Tamura), ¶[0010]. Tamura receives such information from "point-of-sale (POS) terminals which are installed in each retail store" (*i.e.*, sales channel) using a "communication line such as a wide area network (WAN) or Internet communication network." EX1005 (Tamura), ¶[0017].

119. Tamura discloses that it stores the received sales data in, *e.g.*, a "merchandise distribution management server 10." *E.g.*, EX1005 (Tamura), ¶[0017]; *see also* EX1005 (Tamura), ¶[0014], Fig.3:

Fig. 3

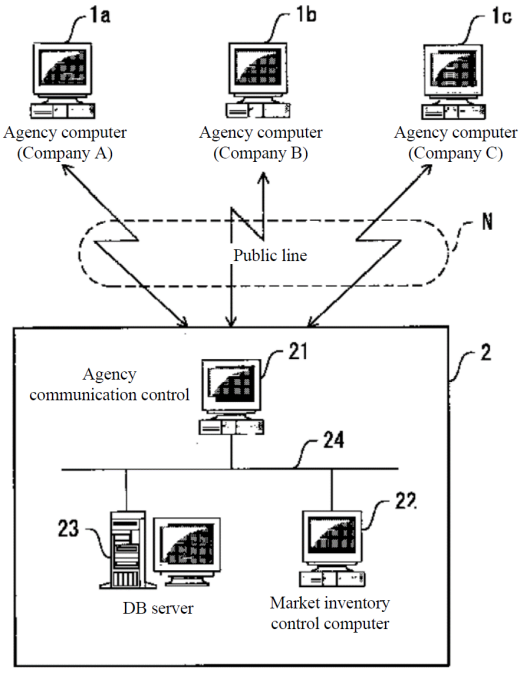


120. Tamura further discloses determining the "sales progress rate" of each "retailer" and based on the "sales progress rate" adjusting the price of inventory items ("if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy"), (*e.g.*, EX1005 (Tamura), ¶[0019]), or modifying inventory allocations by "transfer[ring] the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate." *E.g.*, EX1005 (Tamura), cl.4; *see also* EX1005 (Tamura), ¶¶[0013], [0035], Fig.3.

4. Overview of "Market Inventory Control System and Market Inventory Control Method"—Japanese Unexamined Patent Application Publication No. JP 2002-104622 ("Kono")

121. I understand that Kono (EX1007) is a certified English translation of a Japanese Patent Application Publication (EX1008) that was filed on September 29, 2000, and published on April 10, 2002. I understand that Kono is prior art to the '047 patent. Kono discloses a "market inventory control system," that comprises, among other things, sales channels ("agencies"), "an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer," and a network "such as the Internet" that connects each "agency terminal" and the "manufacturer server device." *E.g.*, EX1007 (Kono), ¶¶[0009], [0024]; Fig.1:

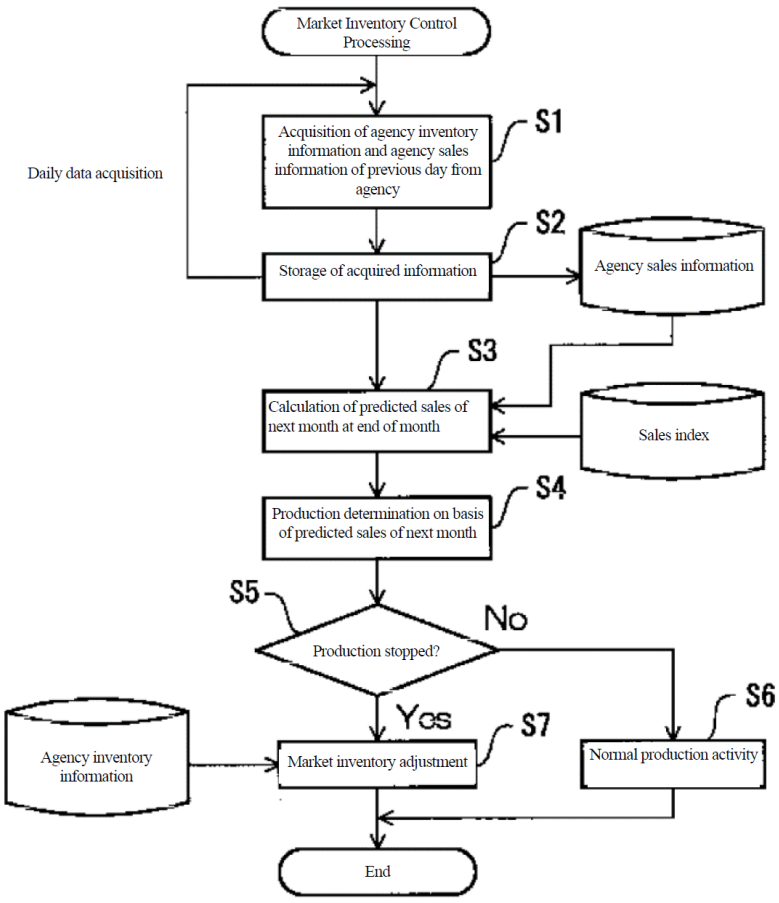
[FIG. 1]



122. Kono discloses that "according to the market inventory control method of the present invention, unnecessary inventory on the market can be effectively and successfully reduced by flexible responses such as… resale of inventory products between agencies." *E.g.*, EX1007 (Kono), ¶[0017].

123. Thus, Kono discloses that its inventory control system "acquire[s] product shipment information from the agency to a retail store and product inventory information of the agency," "performs a sales analysis at each agency," and that, "as a result of the sales analysis," "instruct[s] transfer of inventory product from the agency where sales have fallen to an agency that still sells." EX1007 (Kono), ¶¶[0009], [0045]; Fig.3:

[FIG. 3]



5. Overview of "System and Method for Fulfilling a Media Request"—U.S. Patent No. 7,996,265 ("Evangelist")

124. Evangelist (EX1010) is a U.S. Patent that was issued on August 9, 2011, and filed on May 19, 2005. I understand that Evangelist is prior art to the '047 patent. Evangelist is entitled "System and Method for Fulfilling a Media Request" and discloses, among other things, receiving and fulfilling requests for "on-line inventory" that has been allocated to channels such as "on-line… channels." EX1010 (Evangelist), 6:58-63. Evangelist discloses "allocat[ing] inventory for on-

line… inventory" and that its allocations are automatically performed: "Controller 100 performs allocation of inventory 110, reallocation of inventory 110, or any suitable function for stores 108 and fulfillment stores 106 for each media title offering in the system 10." EX1010 (Evangelist), 9:48-51, 7:29-36, 8:16-23, cls.1, 8, 10, 17, 19, 22, Figs.1,5.

125. Evangelist further discloses using received sale data to, for example, keep track of inventory updates (*e.g.*, EX1010 (Evangelist), 5:20-26, Figs.1-2), and to "determin[e] performance data associated with inventory locations that are stores" (*e.g.*, EX1010 (Evangelist), cls.7, 15-16, 23). And Evangelist discloses using this data to perform "reallocations based on projections made about on-line and in-store activity by considering past histories of on-line and in-store activity of similar media titles" (*e.g.*, EX1010 (Evangelist), 6:53-57), describing that "on-line inventory [] and in-store inventory [] is reallocated based on a comparison of projected activity and actual in-store rental activity." *E.g.*, EX1010 (Evangelist), 7:53-61.

6. Overview of "Dissemination-Based Information Systems" ("Franklin")

126. I understand Franklin (EX1009) is prior art to the '047 patent. I understand Franklin was published in 1996 in Volume 19, No. 3 of the IEEE Computer Society "*Bulletin of the Technical Committee on Data Engineering*," a periodical published by IEEE, a well-known technical and professional organization

dedicated to engineering, computing, and technology. Indeed, as shown on my CV, I am a member of IEEE and a paper reviewer for numerous IEEE journals. I understand that the issue of the "*Bulletin of the Technical Committee on Data Engineering*" (which POSITA would have understood to be a regularly published journal, EX1025, 5), in which Franklin appears was available on the journal's website at least as early as March 7, 2005. EX1024, 4 (URL showing March 7, 2005 ("20050307") availability). Those in my field (including POSITA) were aware of IEEE and would have been looking for papers published by IEEE.

127. Franklin discloses "the construction of distributed information systems that incorporate the ability to ***push*** data out to clients (i.e., dissemination) in addition to having clients ***pull*** data from servers." EX1009 (Franklin), ¶[0001]. Franklin further discloses that "data dissemination" is "the delivery of data from a set of producers" to "consumers" and that "[e]xamples of dissemination-based applications include information feeds (e.g., stock and sports tickets or news wires), traffic information systems, electronic newsletters, and entertainment delivery." EX1009 (Franklin), ¶[0002]. Franklin also discloses the transmission of vehicle-related data (*e.g.*, "traffic information systems" data such as data regarding "potential delays"). EX1009 (Franklin), ¶¶[0002], [0029].

128. Franklin explains that among the advantages of push is that, unlike pull, push does not require a "backchannel" for each request, nor must the nodes

providing the data be continuously interrupted to deal with such requests. *E.g.*, EX1009 (Franklin), ¶¶[0005]-[0010], [0013], [0016], [0020]. Franklin also explains that data sources can push data "in either an aperiodic or periodic fashion," and that ***periodic*** push (pushing data on a "regular, repeating schedule, while aperiodic has no such schedule") is particularly useful in cases where processing load is high at the node receiving data (an asymmetry found in Jacob's computer/server running, *e.g.*, the RezTrip application), allows a system to "obtain the maximal benefit from the available bandwidth," (*e.g.*, EX1009 (Franklin), ¶[0042]), and does not "assume[] that clients are either always listening and able to respond to what is being sent or that missing some further information is not crucial to the application," *e.g.*, EX1009 (Franklin), ¶[0019].

7. Jacob, Phillips, Tamura, Kono, Evangelist, Franklin, and Are Analogous Art

129. In my opinion, each of Jacob, Phillips, Tamura, Kono, Evangelist, and Franklin, is analogous art to the '047 patent. The '047 patent discloses that it relates to managing inventory sold by multiple sales channels by collecting and analyzing sales data to adjust prices and modify inventory allocations among sales channels, using a computer. *E.g.*, EX1001 ('047 patent), Abstract, 1:25-26 (disclosure generally relates to the field of computing systems"), cl.1. '047 is states that it is directed to "efficient selection of Channels for such inventory [to] allow vendors to

achieve a selling price that corresponds with demand for the inventory" such that "an optimum price for, and supply of the inventory in each Channel could be achieved with such correct selection." *E.g.*, EX1001 ('047 patent), 3:38-41. The '047 patent further states that "this invention is intended to cover a wide variety of inventory-types," and that "the travel and accommodation industries, in particular, would benefit greatly from efficient allocations of inventory to various Channels." *E.g.*, EX1001 ('047 patent), 3:44-47.

130. I note that Jacob, Phillips, Tamura, Kono, Evangelist, and Franklin, are also directed to the same field of art as the '047 patent, and are thus analogous to the '047 patent. In particular, each of Jacob, Phillips, Tamura, Kono, and Evangelist, are directed to systems and methods of managing inventory, including inventory that is sold by multiple sales channels and thus these are all analogous to '047 and to one another. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0003]; EX1005 (Tamura), ¶[0009]; EX1007 (Kono), ¶¶[0009], [0017]; EX1010 (Evangelist), Abstract, 1:24-47, 7-17; EX1029 (Phillips), 1, 79-80, 121, 125, 137, 141. Additionally, both the '047 patent and Franklin are directed to computing systems and methods for data communications using networks, and disclose distributed information systems that exchange data (by, *e.g.*, pushing) between clients and servers and from producers to consumers (*e.g.*, "traffic information systems," EX1010 (Franklin), ¶[0002]), over

computerized networks such as the Internet, and thus are analogous. EX1010 (Franklin), ¶¶[0001]-[0002]; EX1001 ('047 patent), Abstract, 3:64-67, cl.1, Fig.1.

131. Moreover, like the '047 patent, Jacob discloses managing and distributing "time-dependent inventory such as hotel rooms, airline seats, rental automobiles, and other associated items." *E.g.*, EX1004 (Jacob), ¶[0001]); *see also* EX1029, 6 (airlines and hotels), 9, 15-16 ("hotels, rental car firms"), 101, 122-123, 125-126, 134-138. Additionally, each of Jacob, Phillips, Tamura, Kono, and Evangelist—like the '047 patent—describes allocating inventory to be sold by a plurality of distribution channels, collecting and analyzing sales data, and based on the outcome of that analysis adjusting the prices of such inventory and/or reallocating such inventory among the plurality of sales channels. *E.g.*, EX1004 (Jacob), ¶¶[0176], [0180]; EX1005 (Tamura), ¶¶[0013], [0019]; EX1007 (Kono), ¶¶[0009], [0045]; EX1010 (Evangelist), 3:35-52, 6:58-61 Figs.1-3, 5; EX1029 (Phillips), 79-80, 134, 136-138.

132. Each of Jacob, Tamura, Kono, Evangelist, Franklin, and Phillips is thus in the same field of art as, and analogous to, the '047 patent.

133. In addition to being directed to the same field of art as the '047 patent, each of Jacob, Phillips, Tamura, Kono, Evangelist and Franklin is analogous to the '047 patent because each is reasonably pertinent to the problems faced by the '047 patent's "inventors." As the '047 patent explains: "the traveling public is

now able to book and pay online for practically all of its travel and accommodation needs via various online travel/accommodation reseller portals and agencies…. The online reseller market is particularly large in this field and the various Channels have the potential to be extremely successful." *E.g.*, EX1001 ('047 patent), 3:47-54. But '047 further explains that "[a] particular problem exists when selling inventory, such as travel services…. The problem is a result of ***the manner in which such inventory is allocated to various resellers***… which ***can be ad hoc and thus inefficient***…. The particular problem is that the market has forced vendors to commit physical inventory to particular Channels ***in a relatively ad hoc manner***." *E.g.*, EX1001 ('047 patent), 1:30-38.

134. Similarly, Jacob explains that the "wide variety of sales channels has brough great benefits to consumers as well as hotels, however the growth in the number of sales channels has created a sales and inventory ***management problem***." *E.g.*, EX1004 (Jacob), ¶[0003]. Jacob further explains that "[o]ne way to ***insure [sic] maximum use of time-dependent inventory*** is to take advantage of many different sales channels." *E.g.*, EX1004 (Jacob), ¶[0002]. Jacob goes on to explain that a ***systematic approach*** is needed: "[i]n addition to a system that accepts reservations, administrators require a ***sales and inventory management system*** that will allow them to ***respond quickly*** to the dynamic nature of the marketplace, pricing and repricing inventory as necessary based on changes in availability, reservation

date, weather, and other factors," *e.g.*, EX1004 (Jacob), ¶[0005]. *see also* EX1004 (Jacob), ¶[0002] ("Yesterday's airline seat, yesterday[']s rental car, and yesterday[']s hotel room have no value today.").

135. Additionally, Phillips discloses "While most companies have pretty good prices in place most of the time, very few have the ***processes and capabilities needed to ensure that they have the right prices in place for all their products, to all their customers, through all their channels, all the time***. This is the goal of pricing and revenue optimization." *E.g.*, EX1029 (Phillips), 1.

136. Tamura similarly discloses a ***systematic approach*** for managing inventory sold by a plurality of sales channels (*e.g.*, Tamura's "retailers"). Tamura explains that, "[a]ccording to the ***sales management system and method*** of the present invention, retail pricing is ***based on scientific, rational, and empirical marketing, thereby eliminating a great deal of the waste in the distribution process***," and that Tamura's system "is especially suitable for industries with… complex distribution mechanisms" (*e.g.*, EX1005 (Tamura), ¶[0015]), and that it "***reduc[es] lost sales opportunities***." *E.g.*, EX1005 (Tamura), ¶[0009].

137. Additionally, Kono also discloses a "market inventory ***control system***" for managing inventory sold by multiple channels (*e.g.*, "agencies") such that "***unnecessary inventory on the market can be effectively and successfully reduced***

by flexible responses such as… resale of inventory products between agencies." *E.g.*, EX1007 (Kono), ¶[0009].

138. Moreover, Evangelist discloses ***systematically managing***, among other things, "on-line inventory" provided through multiple distribution channels ("stores"), and that its system provides "an efficient method of providing a customer with rented media," "promotes efficient operations" by "[a]djusting the inventory to meet customer demand," and further "updates [actual] inventory information… based on [*e.g.*,] fulfilled requests, returned media, inventory updates and reconciliations…." *E.g.*, EX1010 (Evangelist), 1:34-46, 2:34-37 ("Controller 100 represents… any appropriate hardware and controlling logic[] capable of delivering and/or arranging delivery of media to customers 104."), 4:13-16 ("controller 100… generally manages the allocation of inventory 100 in system 10"), 5:20-26, Figs.1-2. Evangelist further discloses "determining performance data [for] stores," (*e.g.*, EX1010 (Evangelist), cls.7, 15-16, 23), and "reallocation based on projections made about on-line and in-store activity by considering past histories." *E.g.*, EX1010 (Evangelist), 6:53-57, 7:53-61.

139. In addition to being directed to the same field of art as the '047 patent, Franklin, too, is analogous to the '047 patent because it is reasonably pertinent to the problems faced by the '047 patent's inventors. The '047 patent discloses that it "is practically impossible for [vendors] to manage… inventory in multiple Channels

while still maintaining their businesses," EX1001 ('047 patent), 1:44-46, and discloses the use of real-time (pushed) (*e.g.*, EX1001 ('047 patent), 7:1-14, 32:16-19; §VI.C (above)) information exchanged between producers and consumers to address this problem, EX1001 ('047 patent), 2:4-8, 3:47-54. Franklin also discloses the efficient use of real time information in distributed information systems that exchange data between clients and servers and from "producers" to "consumers," EX1010 (Franklin), ¶[0002], over computerized networks such as the Internet. EX1010 (Franklin), ¶¶[0001]-[0002]; EX1001 ('047 patent), Abstract, 1:25-26, 2:4-8, cl.1, Fig.1, and provides methods for efficiently doing so (*e.g.*, periodic push). *E.g.*, EX1009 (Franklin), ¶[0014], Fig.1.

140. Thus, for these reasons as well, it is my opinion that these references are all analogous to the '047 patent.

141. I also note that neither Jacob, nor Tamura, nor Kono, nor Evangelist, nor Franklin, nor Phillips was before the Examiner during prosecution of the '047 patent.

142. For ease of presentation, in the following section I discuss each of the challenged claims, beginning with claims 1-3, followed by claims 4-6. The **arguments and evidence provided for claims 1-3 include the arguments and evidence establishing that claims 4-6 are also unpatentable as obvious.**

8. Claim 1 is Rendered Obvious By (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

a. Element 1[pre][5]

143. **In my opinion, claim 1 is rendered obvious over (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.** *See infra*, pp.517-738.

[5] To the extent it is deemed to be a limitation of the claim, this preamble is disclosed.

144. Claim 1[pre] recites **"A computer-implemented method of managing online bookings for transportation services inventory, the computer-implemented method comprising." In my opinion, Jacob or Jacob-Phillips discloses or renders obvious this limitation.**

145. In my opinion, **Jacob discloses a computer-implemented method** (*e.g.*, "computer program systems comprised of a series of code segments," implemented with "computer software or computer hardware or a combination of computer software and hardware," "computerized database") **of managing online bookings** (*e.g.*, "reservations") **for transportation services inventory** (*e.g.*, "method for managing time-dependent inventory such as hotel rooms, rental automobiles, and airline seats as well as associated items")**.**

146. Jacob discloses a **computer-implemented method**. For example, Jacob discloses, "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form***

of computer software or computer hardware or a combination of computer software and hardware. The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items." *E.g.*, EX1004 (Jacob), ¶[0006]; *see also* EX1004 (Jacob), ¶[0078] ("As used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which manage data do so through their associated functions."), Fig.7:

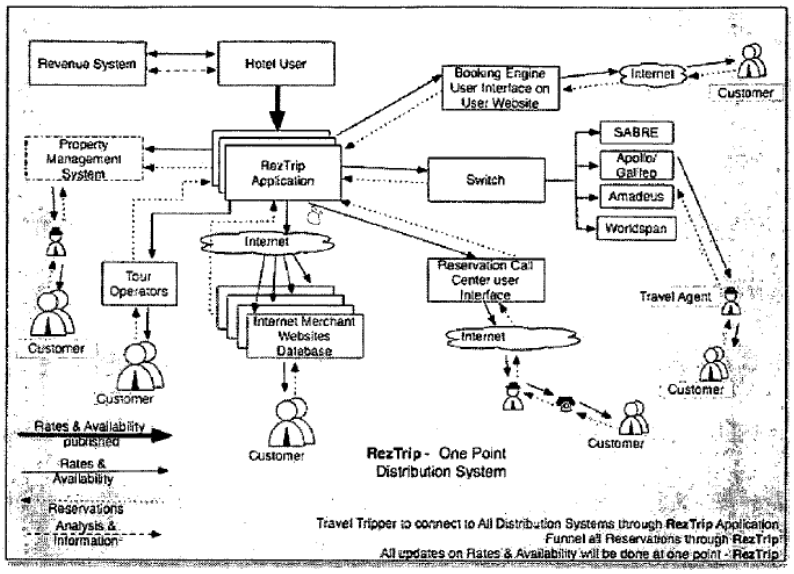


Figure 7

147. Jacob additionally discloses, for example, "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform***

certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data. Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels**.** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software. Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network.*** Embodiments of

the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082].

148. Jacob further discloses, for example: "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." *E.g.*, EX1004 (Jacob), ¶[0083].

149. Jacob additionally discloses that "***[e]mbodiments of the invention comprise a computerized database*** such as Oracle™, SQL Server™, DB2™,

MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." *E.g.*, EX1004 (Jacob), ¶[0084].

150. **Jacob also discloses that its computer-implemented method is a method of managing online bookings for transportation services inventory.** For example, Jacob discloses "[a] ***system and method for managing time-dependent inventory such as hotel rooms, rental automobiles, and airline seats as well as associated items is disclosed***. The system and method may be used to manage the price of inventory, the type of inventory, and the dates the inventory is offered for sale. The disclosed system and method simplify the management of inventory across multiple inventory types, inventory prices, and inventory availability dates by creating hierarchies and allowing changes to one element of a hierarchy to cause

changes to other elements in the hierarchy." *E.g.*, EX1004 (Jacob), Abstract; *see also* EX1004 (Jacob), ¶[0009] ("***In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations.*** The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations.").

151. Jacob further discloses, for example, that its "invention relates to the field of inventory management and distribution, specifically the management of time-dependent inventory such as hotel rooms, airline seats, rental automobiles, and other associated items." *E.g.*, EX1004 (Jacob), ¶[0001].

152. And Jacob explains that, "[w]hile the description that follows relates to hotel rooms, persons skilled in the art will realize that ***the problems described and solutions offered apply to rental items and time-dependent inventory generally***. The value of time-dependent inventory is a function of time. ***Yesterday's airline seat, yesterday[']s rental car, and yesterday[']s hotel room stay have no value today.*** Maximizing rental revenue relies on maximizing the use of rental property. One way to insure maximum use of time-dependent inventory is to take advantage of many different sales channels." *E.g.*, EX1004 (Jacob), ¶[0002].

153. Additionally, Figure 7 shows the "RezTrip™" system of Jacob, which, among other things, "communicates with the hotel user, the hotel property

management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website." *E.g.*, EX1004 (Jacob), ¶[0085], Fig.7:

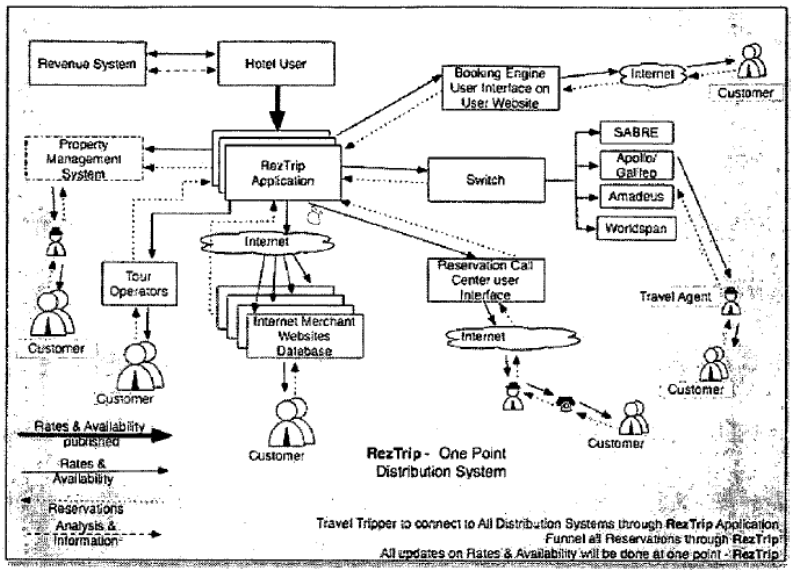


Figure 7

154. Jacob expressly discloses performing its various functions (*see, e.g.*, cl.1[h]-[i]) automatically (without needing human intervention), including, *e.g.*, "perform[ing]" price "calculations automatically" code segments "to analyze the information received from the sales channels," and/or receiving sale data relating to a sale price of each item. *E.g.*, EX1004 (Jacob), ¶¶[0005], [0006], [0010], [0131]-[0133]; cl.4 (*e.g.*, "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate"). To the extent it is argued further disclosure of automating the functions of Jacob is required, including so that they are performed

automatically/without human intervention, **POSITA would at minimum have found it obvious based on Jacob in view of Phillips.**[6]

155. **Phillips discloses a computer-implemented method** (*e.g.*, "computerized reservation systems"; "computerized revenue management systems", "computerized pricing support system," "software systems," "computerized systems," "revenue management systems," "Pricing and revenue optimization systems")**, including in the context of managing online bookings** (*e.g.*, "on a hotel's own Web site," "Expedia/Travelocity," airline's "Web site," etc.) **for transportation services** (*e.g.*, "hotels," "ticket for… airline," etc.)**, using software to optimize and automate functions so they can be performed without human intervention** (*e.g.*, "software systems that solve the underlying optimization problem", "recommend actions based on sophisticated mathematical algorithms," "computerized systems to recommend actions based on sophisticated mathematical algorithms", "the majority of prices will be updated automatically" including "moment to moment")**.**

156. For example, Phillips discloses "Pricing and revenue optimization systems" (*e.g.*, EX1029 (Phillips), 9), and that "[a]nalyz[ing] [a]lternatives…

[6] While this automaticity is disclosed (or, alternatively, rendered obvious) by Jacob alone, each of the Grounds discussed herein include Jacob-Phillips.

Historically… involved analysts' use of spreadsheets…. More recently it has involved the use of software systems that solve the underlying optimization problem to recommend new prices for every element of the PRO cube." *E.g.*, EX1029 (Phillips), 30.

157. Phillips discloses the importance of revenue management systems: "While most companies have pretty good prices in place most of the time, very few have the processes and capabilities needed to ***ensure that they have the right prices in place for all their products, to all their customers, through all their channels, all the time***. This is ***the goal of pricing and revenue optimization***." *E.g.*, EX1029 (Phillips), 1; *see also* EX1029 (Phillips), 134-135 ("Revenue management systems. The primary job of a revenue management system is to calculate and update the booking limits within the reservation system… receives a feed of bookings and cancellations from the reservations system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems."), 137-138 ("The range of costs shown in Figure 6.4 represents a ***channel-pricing*** opportunity. It also provides an expanded opportunity for ***revenue management—airlines and hotels can establish fare classes based on the channel*** of a booking request ***and determine whether or not to provide availability through that channel***. Furthermore, it provides a tremendous

economic incentive for revenue management companies to ***steer demand as much as possible through lower-cost channels***.").

Phillips additionally discloses that "***Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function***. These departments rely on ***computerized systems to recommend actions based on sophisticated mathematical algorithms***." *E.g.*, EX1029 (Phillips), 141; *see also* EX1029 (Phillips), 30 ("Choose the best alternative… In very rapidly changing environments such as the passenger airlines, the majority of prices will be updated automatically, with analysts only investigating the unusual or unexpected situations.").

158. Phillips also discloses that "Much of the interest in pricing and revenue optimization has focused on its use of mathematical analysis. Quantitative analysis is indeed critical in most pricing and revenue optimization settings, but it cannot provide sustainable improvement unless it is embedded in the right process." *E.g.*, EX1029 (Phillips), 30; *see also* EX1029 (Phillips), 31 ("Here, the effects of the most recent actions should be monitored so that immediate action can be taken if necessary.").

159. In addition, Phillips discloses, "The ***operational PRO activities work continuously to set and update prices in the marketplace***. The timing of the decisions will depend on the application—***airline revenue management systems can change fares from moment to moment.***" *E.g.*, EX1029 (Phillips), 30; *see also* EX1029 (Phillips), 32 ("As we discuss in Chapter 3, the corporate goal in a product /segment /channel combination determines the form of the objective function that will be used when optimizing that "cell" of the PRO cube.").

160. Phillips expressly discloses updating prices automatically. Phillips states that revenue management systems aim to "***[c]hoose the best alternative***…. In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations." *E.g.*, EX1029 (Phillips), 30; *see also* EX1029 (Phillips), 33 ("At this point, most companies consider adopting some sort of computerized pricing support system."), 121 ("Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("computerized revenue management systems"), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 134-35

("The *forecasting module* generates and updates for all products/fare class combinations for all future dates… These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights***").

161. In addition, Phillips explains that "[i]ncremental costs may vary by channel and market segment. In particular, commissions and distribution fees are important components of incremental cost in many revenue management industries. SABRE charges $3 to $4 per flight segment for an airline booking and about $4 per room for a typical hotel booking. In addition, travel agents receive a commission of about 10% for every booking they make. On the other hand, the variable cost of a ***direct reservation on a hotel's own Web site*** is about $1.50 (Marvel 2004)." *E.g.*, EX1029 (Phillips), 137.

162. Phillips further explains that "Figure 6.4 shows distribution costs for a $325 ticket sold through different channels for a major U.S. airline in 2002. The cost per booking varies from less than $10 for an opaque ticket to almost $45 for a booking sold through a travel agency." *E.g.*, EX1029 (Phillips), 137; *see also* EX1029 (Phillips), Fig.6.4 (showing distribution costs for "Expedia/Travelocity," "Web site," for "$325 ticket for a major U.S. airline").

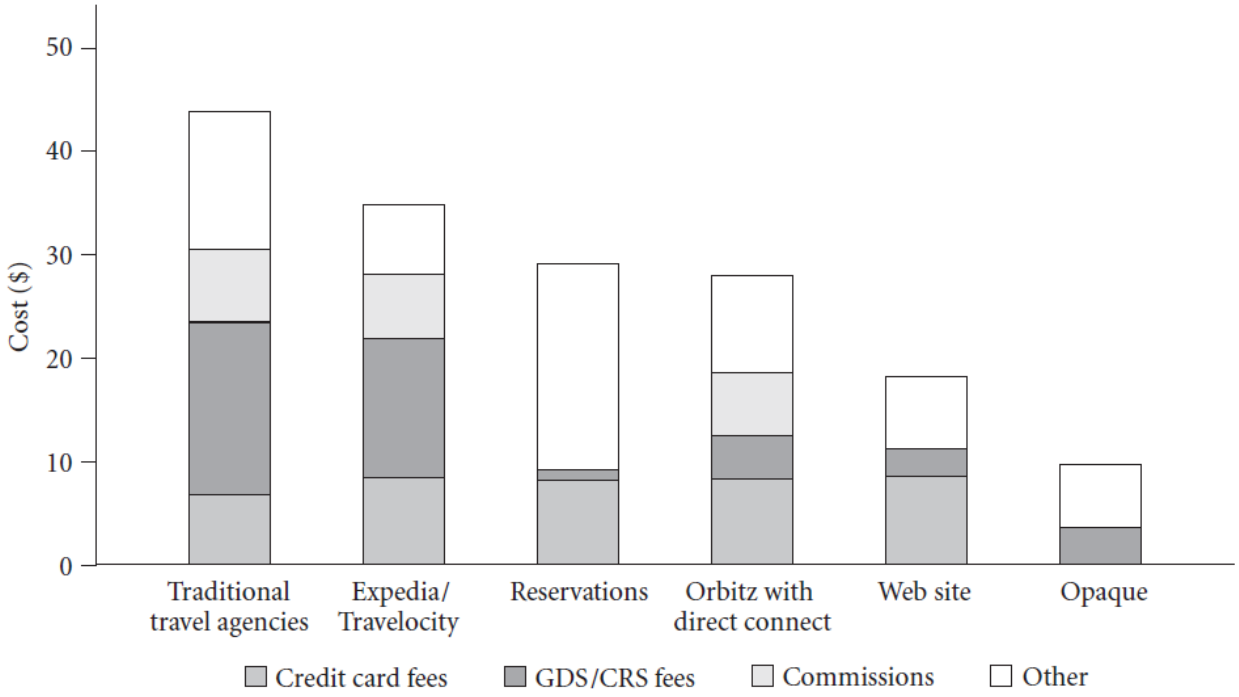


Figure 6.4 Per-ticket distribution costs by channel for a $325 ticket for a major U.S. airline (2002). *Source*: Figure courtesy of Continental Airlines.

163. Both Jacob and Phillips describe inventory management systems that allocate inventory to online distribution channels and that use sale data received from those channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0176], [0180]; EX1029 (Phillips), 9, 30, 33, 121-122, 134-135, 141. And Jacob discloses that a sales and inventory management system "should allow the administrator to change the pricing of all items… with a minimum of data entry by the staff." *E.g.*, EX1004 (Jacob), ¶[0005].

164. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed computer-implemented method of managing online bookings of inventory using Phillips's beneficial teachings of automating sales processes (including the analysis and "moment to moment" updating of inventory prices and allocations; *see also* cl.1[h]-[i].)** The combination would have advantageously increased the system's ability to monitor and track accurately each channel's revenue and inventory status and, to the extent it is argued that it is required, allowed it to run automatically/without requiring human intervention, thereby permitting the system to better and more quickly adapt as described below—including, *e.g.*, to analyze whether and how prices/allocations should be adjusted to "maximize revenue" and whether/if a particular sales channel is in danger of running out of inventory or is out of inventory and to compare and determine accurately whether a particular channel is selling inventory better than other channels without having to wait for a human to perform calculations or otherwise provide input, and without introducing unnecessary human error. This would have furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" by, *e.g.*, increasing the efficiency of the system in responding to changing market conditions by adjusting prices and/or reallocating inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of

inventory. *E.g.*, EX1004 (Jacob), ¶[0002]. This also would have reduced the response time/increased the speed of the system (by reducing the need to wait for and address user intervention), thereby allowing the system to more quickly address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory thus better "insur[ing] maximum use of time-dependent inventory." *E.g.*, EX1004 (Jacob), ¶¶[0002], [0005] (update prices with "minimum of data entry by the staff"). And it would have furthered Phillips's express goal of "pricing revenue and optimization" and to "ensure [companies] have the right prices in place for all their products, to all their customers, through all their channels, all the time." *E.g.*, EX1029 (Phillips), 1, 5 (discussing "pricing and revenue optimization (PHO) decisions" and the need to "manage and update prices in a fast-moving, highly transparent, online environment"), 7, 33 ("As price changes become more frequent and the pricing structure becomes more complex, it becomes less and less feasible for a company to apply in-depth analysis to each pricing decision… A common symptom is that despite expending more and more effort on pricing decisions, the company continually seems to be one step behind the market and the competition. At this point, most companies consider adopting some sort of computerized pricing support system."). This would also have minimized the need for costly human labor. For POSITA it would have been routine to make such an implementation choice, and (particularly in light of these disclosures) clear it would

work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

165. Thus, in my opinion, Jacob discloses or Jacob in view of Phillips renders obvious this limitation.

b. Element 1[a]

166. Claim 1[a] recites **"establishing a channel interface that provides bidirectional communication between at least one server computing device[7] and a vendor computing device."[8] In my opinion, Jacob (in the recited**

[7] The '047 patent states "'[c]omputer is any apparatus capable of carrying out data processing functions and includes a computer system, or a collection of one or more apparatus," EX1001 ('047 patent), 37:58-62, and "'[s]erver' is a computer or other data processing apparatus that is capable of carrying out server side operations," EX1001 ('047 patent) , 38:4-5.

[8] The '047 patent states "'vendor' is used broadly and can be interchanged with 'Property' as that word has been defined earlier" (EX1001 ('047 patent), 31:1-3), and "Property is to be understood as a characteristic of the Rooms that makes comparison between the Rooms meaningful. For example, the rooms could be sourced

combinations) discloses or at minimum renders obvious this limitation. Alternatively, in my opinion, Jacob (in the recited combinations) in view of Tamura, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.

167. In my opinion, **Jacob discloses establishing a channel interface** (*e.g.*, portion of "computer program system[]" (*see* cl.1[pre]) configured to manage communication between computers used by, *e.g.*, "hotel staff"/"employees" (with, *e.g.*, related "code segment[s]") including over a computerized network (*e.g.*, "wired or wireless networks")) **that provides bidirectional communication** (*e.g.*, enables "communications over wired or wireless networks"—*e.g.*, to permit hotel personnel to "set up"/"initially" "adminster[]" available hotel inventory "by entering relevant Property information" to be used by "reservation engine"/"RezTrip Application"; "delivers output to users, and accepts input from users"; "communicate[s] with the hotel staff") **between at least one server computing device** (*e.g.*, "[s]erver"/"computerized database" "implement[ing]" "RezTrip Application" (Fig.7)/"system to manage the sales, pricing, and inventory information related to time-dependent items") **and a vendor computing device** (*e.g.*, computer system of

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from a common hotel franchise or from a particular geographical area," EX1001 ('047 patent), 8:19-24. *See also* EX1001 ('047 patent), 28:48-60.

"Hotel User" (*see* Fig.7)[9] used by a hotel's "staff," employees, etc. to communicate "through a wired or wireless network" with, *e.g.*, "server"/"computerized database" "implement[ing]" "RezTrip Application"; "computer software or… hardware or a combination of computer software and hardware" used by "Superuser"/"Engine Administrator"/"Property Administrators" of "clients" (which can be "Individual Properties" or a "group of Properties") including "Companies who may not own Properties, but have bought batches of Rooms from other properties to sell to clients," "management company or chain that owns several properties," or "Portal," to "administer[]"/"manage" the "Property," "group of properties," "batches of Rooms," "several properties," or "Portal")**.**

168. For example, **Jacob discloses establishing a channel connection interface.** Jacob discloses that embodiments of its invention "are computer program systems": "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code

[9] As discussed *infra,* in my opinion, POSITA would have understood the block of Fig.7 labeled "Hotel User" (like, *e.g.*, the "Revenue System" with which "Hotel User" exchanges data) to indicate a computer/system—not a person (like, *e.g.*, the "Customer," "Travel Agent," etc. illustrated in Fig.7 with icons indicating people).

segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" *E.g.*, EX1004 (Jacob), ¶[0006].

169. Jacob further discloses that "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment

configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software. Embodiments of the invention may be located*** on one computer or ***on a plurality of computers connected to one another through a wired or wireless network***. ***Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser.*** User input may be in

the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082].

170. **Jacob further discloses that its channel interface provides bidirectional communication between at least one server computing device and a vendor computing device.** For example, Jacob discloses that "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." *E.g.*, EX1004 (Jacob), ¶[0083].

171. Jacob further discloses a "[s]erver"/"computerized database" "implement[ing]," *e.g.*, the "RezTrip Application": "***Embodiments of the invention comprise a computerized database such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data,***

add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, ***embodiments of the invention comprise code segments configured to interact with the database***, to interact with users (EU's, SU's, EA's, and PA's), ***and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks.***" *E.g.*, EX1004 (Jacob), ¶[0084].

172. Additionally, Jacob discloses multiple "clients" of the RezTrip application: "The ***RezTrip™ application may have clients*** that comprise: "A group of Properties"/"Individual Properties"/"Companies who may not own Properties, but have bought batches of Rooms from other properties to sell to clients."/"A management company or chain that owns several properties." *E.g.*, EX1004 (Jacob), ¶¶[0093]-[0097].

173. Jacob further discloses, among other things, "As used herein ***a Portal refers to a Property or series of Properties managed as an entity. Users of the system may comprise owners of individual properties, owners of multiple properties, and others who may not own properties but instead agree to sell groups of rooms on a contract basis***. A direct Portal refers to all the Properties that are directly utilizing the services of the reservation engine. An indirect Portal refers to

Properties that have contracted some or all of their rooms to an intermediary, and the intermediary has chosen to use the services of the reservation engine. A single physical Property can be part of either a direct portal or an indirect portal, or both. A portal is a logical grouping of rooms and/or properties that allows one person to manage groups of Properties/Rooms from a single point." *E.g.*, EX1004 (Jacob), ¶¶[0069]-[0070].

174. In addition, Jacob discloses different user types: "As used herein an Engine Administrator, or EA is a user or group of users, similar to the Superuser, who can perform every action in the system, but only on properties and users which they have created in the system. An EA cannot view or edit details on properties/users created by other EA's." *E.g.*, EX1004 (Jacob), ¶[0065]; *see also* EX1004 (Jacob), ¶¶[0066], [0064] ("As used herein a Property Administrator or PA is a user or group of users who are the owners/***employees*** of ***properties that are managed with the system***. The PA is responsible for configuring and maintaining daily rates, the inventory, and the property features that show up via the reservation engine."), ("As used herein Superuser, or SU, refers to the user or group of users that can perform every action in the system ***across any portal and Property that exist in the system***. The SU has complete authority to manage any function available in the system."), [0092] ("The portal code segment is configured to manage Portal data and

comprises Portal functions. ***A Portal refers to a Property or series of Properties managed as an entity.***").

175. Jacob discloses that the users of its clients perform various tasks, including "administer[ing] the Property": "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The data relating to the Property are stored in the system database. The EA or SU then associates a PA with the property. ***The PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies,*** and later by managing inventory and room rates. Once the PA has ***set up the Property within the system,*** EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property." *E.g.*, EX1004 (Jacob), ¶[0086]; *see also* EX1004 (Jacob) ¶¶[0113] ("As shown in FIG. 17, the PA enters property data on the 'Add Property' screen. The data comprise address information including street, city, state, country, postal code, as well as radio buttons indicating whether to display special rate types, default amenities, default property facilities, default bed types, and default common room attributes. ***After a Property has been added to the system it may be managed by selecting it from the Property list, as shown in FIG. 18. Selecting a Property from the Property list brings up a form displaying the default***

Property information as shown in FIG. 19. Default information comprises reservation transaction fee, active/inactive status, low inventory alert level, guarantee/cancellation policy, minimum room price, default currency, default date format, and check-in/check-out times."), [0088] ("Upon login the SU is presented with the option of ***picking the portal they want to work*** within as shown in FIG. 13; no other action is possible until a portal has been chosen. After choosing a portal, menu functions become available. While a SU may perform all system and property management functions, properties are generally managed by less privileged EA and PA users."), [0099] ("As shown in FIGS. 13, 14, and 15, the system allows SUs to select portals; create new portals, enter portal data, to edit portals, and to activate/inactivate portals. ***Portals are created, edited, and activated/inactivated by clicking on the appropriate menu items on the relevant screens and entering the required data in the forms. Each portal may have Properties and users created within it. The associations between a Property and users are performed within the scope of a portal. A Property from one portal cannot be associated with an EA or a PA from another portal.*** EAs operate within the portal with which they are associated. SUs may operate on any portal in the system."), [0111] ("***During the course of working with a Property all SU, EA, and PA users are clearly shown the portal and the Property to which they are making changes.*** The administrative users (SU, EA, PA) have the ability to change Properties, to move from one Property

to another. ***If the user is logged on as SU then the user also has the ability to change portals.***"), Figs.8, 12-13:

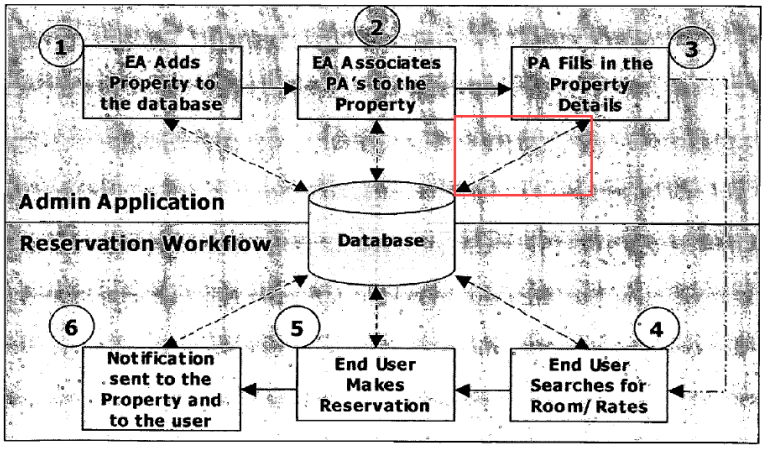


Figure 8

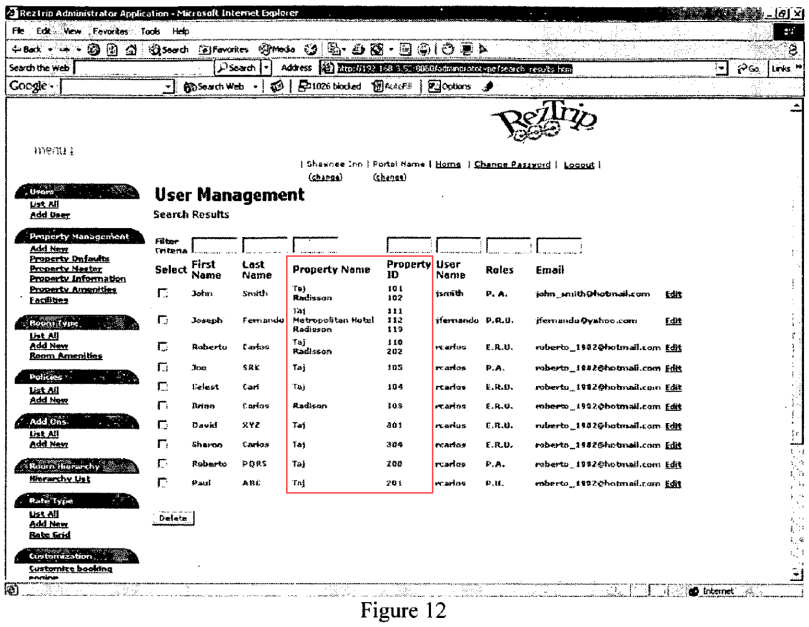


Figure 12

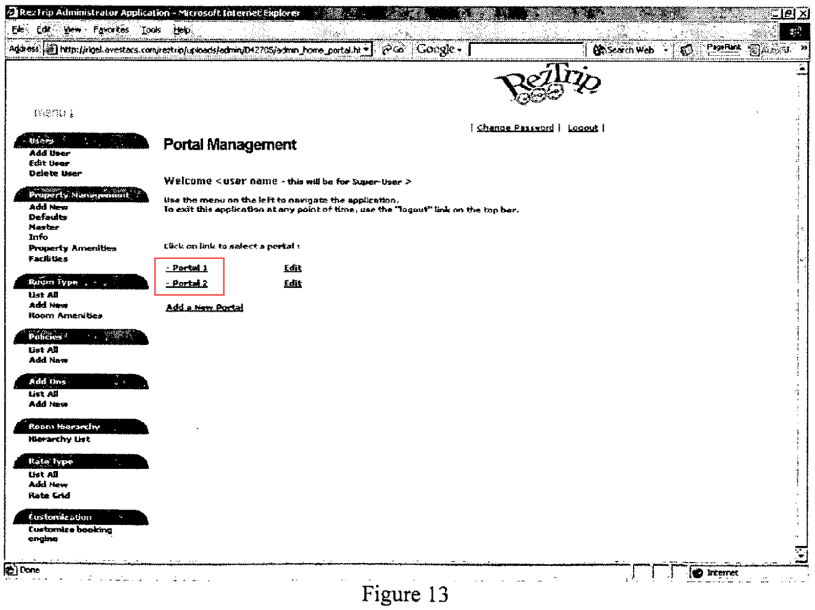


Figure 13

176. Jacob discloses that users of Jacob's clients utilize an "application" to communicate with the RezTrip system: "As used herein the Reservation Engine, Bookings Engine, and RezTrip™ Reservation Application refer to an application used by EU's to make reservations. One embodiment of the invention, RezTripTM, comprises a ***reservation engine*** for use by EUs, and an ***administrative application for use by hotel owners/employees***." *E.g.*, EX1004 (Jacob), ¶[0071].

177. In addition, Jacob discloses "***The system may be configured to communicate with the hotel staff, the hotel property management database, and a plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™, telephone reservation systems, a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems, and tour operators. The system allows hotel users to log into***

the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." *E.g.*, EX1004 (Jacob), ¶[0007]; *see also* EX1004 (Jacob), ¶[0085] ("The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described.").

178. Jacob further discloses that its RezTrip application communicates pricing changes from the vendor (*e.g.*, Property) to sales channels: "The system comprises a pricing code segment configured to allow the property administrators to manage room pricing information. The pricing code segment comprises the pricing functions. The prior art pricing change process is illustrated in FIG. 4. A property administrator wishing to change rates for rooms must manage each room type, rate type, date, and constraint type combination individually. As the number of room

types, rate types, dates, and constraints grow, the task of changing and/or managing the information grows geometrically. As illustrated in FIG. 5, embodiments of the invention define a matrix of relationships between room types, rate types, and room constraints. The pricing code segment functions by basing room prices upon the price of a standard room offered at the best available rate (BAR). For example, a standard single occupancy room may be offered at a particular BAR. The hotel user then enters the rates of the other rooms as a function of the BAR. Double occupancy may command a rate of BAR plus an extra person charge, triple occupancy may command a rate of BAR plus 2 times the extra person charge. A deluxe room may be priced at 15% above BAR, or $50 above BAR, or some other figure based upon BAR. Prices based upon combinations of room type, occupancy, special discounts, group discounts, and preferred client pricing may be set. Once the matrix of the dependencies upon the BAR are set, the system can calculate the prices of the available rooms. The matrix of BAR dependencies needs only to be set once. Subsequent room pricing changes may be implemented by changing only BAR. The rest of the room prices and rates can be calculated automatically based upon the matrix of BAR dependencies. Individual room prices may be set manually, overriding prices calculated by the matrix of BAR dependencies. ***Once pricing changes have been implemented the results may be distributed through the communication code segment or code segments to the sales channels.*** By defining

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a matrix of relationships or hierarchies between room types, rate types, and constraints, embodiments of the invention allow PA's to modify one rate, for example the BAR rate of a standard room type, and have other rates (floating rates) automatically changed as illustrated in FIG. 6." *E.g.*, EX1004 (Jacob), ¶[0008]; *see also* EX1004 (Jacob), ¶[0191] ("The ***communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions***. Once the Rate Types, Room Types, and inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels. Other information communicated to the selling channels may comprise add-on information, package information, amenity information, and facility information. ***The information is communicated to the selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click.*** As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such***

as the internet or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form."), [0009] ("In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations. ***The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations***."), [0133] ("Communicate the prices to a plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or communicate in response to a user initiated triggering event***, such as a mouse click."), [0185] ("The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***"), cl.5 ("The system of claim 1 further comprising ***a code segment configured to communicate pricing information and inventory information to a plurality of sales channels***."), cl.6 ("The system of claim 5 further comprising ***a code segment to automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***."), Fig.7:

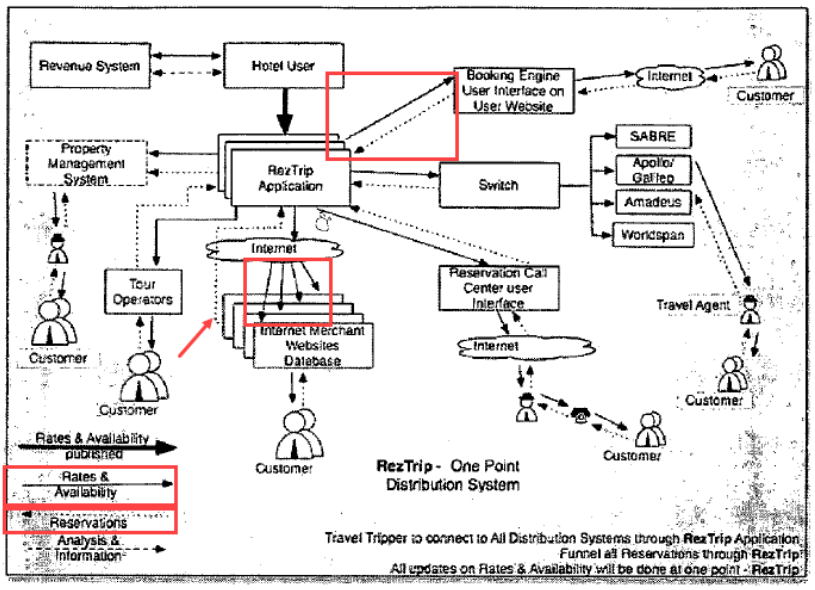


Figure 7

179. Jacob further discloses that the RezTrip system receives information from the sales channels and communicates such information to, *e.g.*, the Property: "The reservation engine code segment is configured to manage reservation engine data and comprises reservation engine functions. ***When an EU, using the reservation engine, successfully completes a reservation, a confirmation is sent to the EU. The application also notifies the PA to allow the administrator to perform the associated financial and administrative tasks.*** The application sends confirmations to the EUs and notifications to the PA via communications over wired or wireless networks in either an encrypted or unencrypted form. Typically, the communications will comprise an electronic mail message or a facsimile message." *E.g.*, EX1004 (Jacob), ¶[0192]; *see also* EX1004 (Jacob), ¶[0010] ("The system may

further comprise a revenue management code segment. The ***revenue management code segment is used to analyze the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue.").

180. Jacob expressly discloses its inventory management system (*e.g.*, computer/server running, *e.g.*, the "RezTrip" application ("RezTrip computer/server")) includes "computer software or computer hardware or a combination of computer software and hardware" used by personnel (*e.g.*, "Property Administrators") of Jacob's inventory-selling "clients" (*e.g.*, vendors such as "Individual Properties" or "a group of Properties") to "set up" and "administer[]" such Properties and to communicate property information to the RezTrip computer/server. *E.g.*, EX1004 (Jacob), ¶¶[0006], [0069], [0084]-[0086], [0093]-[0097], Figs.7-8. Jacob further discloses "[e]mbodiments" where its invention is "located… on a plurality of computers connected to one another through a wired or wireless network" (*e.g.*, EX1004 (Jacob), ¶[0082]), and POSITA would have understood the block of Jacob's Fig.7 labeled "Hotel User" (like, *e.g.*, the "Revenue System" with which it exchanges data) to indicate a computer/system—rather than a person. *See* red annotation, *infra*. When, in contrast, Fig. 7 depicts a person (like, *e.g.*, a "Customer," "Travel Agent," etc.) it does so with an icon indicating people (*e.g.,* yellow annotations, *infra*):

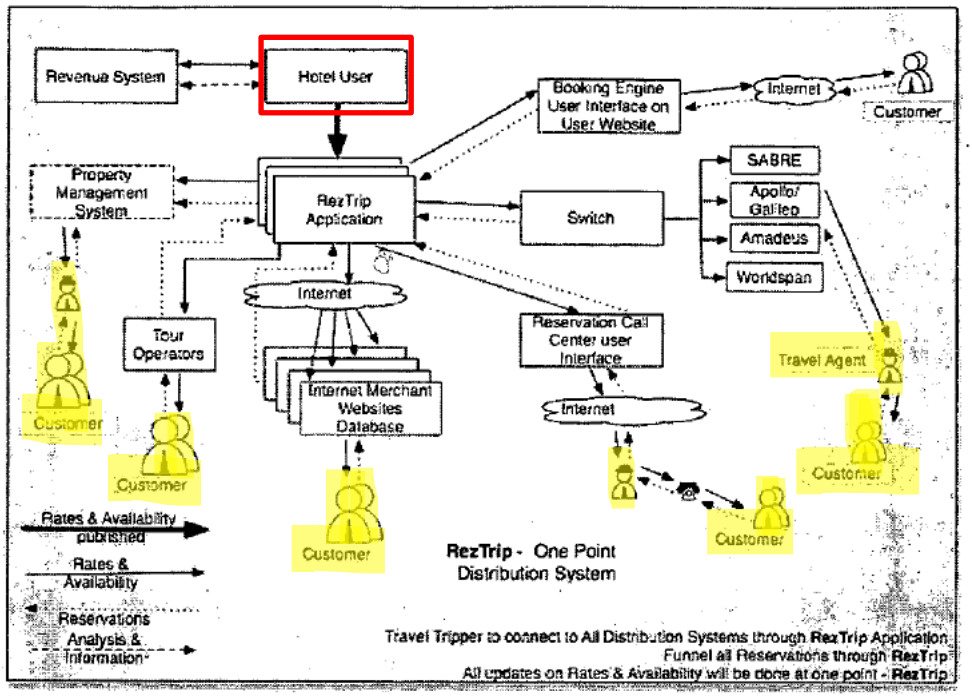


Figure 7

181. In my opinion, **POSITA would thus have understood Jacob to disclose, expressly, a "vendor computing device."** *See* n.8, above.

182. To the extent it is argued further disclosure of a vendor computing device is required, at minimum, **this would have been obvious from Jacob (in the recited combinations).** As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and uses sale data received from those channels to more efficiently manage inventory and better adapt to market demand (*e.g.*, using Jacob's RezTrip application), and further discloses that the RezTrip application may have multiple "clients" (including, *e.g.*, "Individual Properties, "A group of properties," and "[a]

management company or chain that owns several properties"). *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0093]-[0097], [0176], [0180].

183. In my opinion, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Jacob's disclosure that "[e]mbodiments of the invention may be located… on a *plurality* of computers connected to one another through a wired or wireless network," such that in the resulting system the multiple clients of the RezTrip application/owners of different properties or groups of properties each use their own vendor computing device (or multiple vendor computing devices) that exchanges information with, *e.g.*, a RezTrip computer/server (including its associated "database").** This would have enabled personnel of a client/property—*e.g.*, a hotel's administrator, staff, etc.—to connect (including remotely) to the RezTrip computer/server, and thus (using the hotel example for illustrative purposes only), among other things, beneficially: permit multiple hotel chain employees (and multiple hotel chains) in multiple locations to use a single shared server and database without requiring the RezTrip application and associated data to be replicated and constantly updated in its entirety in many separate locations; enabling the use overall of fewer (or just one) more powerful and faster—and, thus, more costly—

computer/server installations running the RezTrip application; and allowing more updates to the RezTrip application and associated components to be done centrally/at fewer installations. Among other things, this would have further increased the system's speed and efficiency in managing property/inventory-related information, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory." This would also have beneficially facilitated communication and (to the extent desired and permitted) data sharing between and among Jacob's different owners/administrators of properties/groups of properties, or across properties/groups of properties with a common owner. For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029 (Phillips), 33 ("computerized pricing support system"), 121 ("Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("Throughout the remainder of the 1980s and well into the 1990s, carriers such as United, Delta, and Continental invested millions of dollars in implementing computerized revenue management systems…."), Fig.6.1.

184. Additionally, to the extent it is argued further disclosure of a "***server*** computing device" is required, **POSITA would have found this obvious from**

Jacob (in the recited combinations). As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and that uses sale data received from those channels to more efficiently manage inventory and better adapt to market demand, discloses the use of database servers (*e.g.*, Microsoft's relational database management system, "SQL **Server**™") "to manage hotel data" of the kinds input by hotel personnel for use by Jacob's RezTrip application, and further discloses that the RezTrip application may have multiple "clients" (including "Individual Properties, "A group of properties," and "[a] management company or chain that owns several properties"). *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0084] ("The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, [etc.]"), [0093]-[0097], [0176], [0180].

185. In my opinion, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations (including its code segments, computer hardware/software, and database)) such that in the combined system the functions of the RezTrip computer/server are performed by a server computing device (including, *e.g.*, by a database server).** Implementing the RezTrip application on a server computing device would, *inter alia*, have

beneficially provided the additional memory, processing capability, and accessibility by other software/processors that are made possible by servers, thus allowing the system to more quickly process and store data and make it available to the "plurality of computers connected to one another" that make up Jacob's disclosed system (as well as to other systems), thus allowing the system to work over a larger system topology with larger data sets (*e.g.*, sale data), to more simply bring in external data for use in its analyses, and to respond more quickly to changing market dynamics, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory." *See also* EX1004 (Jacob), ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.[10]

[10] POSITA's reasonable expectation of success here and for all of the obviousness arguments herein is further confirmed by this technology's predictability. As discussed above (§V), POSITA would have been well aware of all the hardware and

186. To the extent it is argued further disclosure of a server computing device or a vendor computing device is required, at minimum, **this would have been obvious from Jacob (in the recited combinations) in view of Tamura.**

187. **Tamura discloses establishing a channel interface** (*e.g.*, portion of "sales management server 20" and "merchandise distribution server 10" enabling "connect[ion]" between "sales management server 20" and "merchandise distribution server 10"/"connect[ion] to network" (*see* Fig.3); portion of "sales management server 20" and "merchandise distribution server 10" enabling "connect[ion]" between "sales management system 20"/"merchandise distribution server 10" and "sales rep part 50" (*see* Fig.3)) **that provides bidirectional communication** (*e.g.*, bidirectional communication links in Figs.1, 3; bidirectional communication links in Fig.3) **between at least one server computing device** (*e.g.*,

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software used in the combinations discussed herein—*e.g.*, server computing devices were well known in the art. *E.g.*, EX1013 (Meunier), ¶[0156] ("CRMLS is comprised of one or several networked computer servers capable of rapidly processing a high volume of operations."); EX1011 (Walker), 5:6-12 (discussing "server"); EX1004 (Jacob), ¶[0084] ("Embodiments of the invention comprise a computerized database such as… **SQL Server™**").

"Merchandise distribution management server 10") **and a vendor computing device** (*e.g.*, "sales management system 20"; "sales rep part 50")**.**

188. **Tamura discloses establishing a channel interface.** For example, Tamura discloses that "Fig. 3 is a block diagram of the general configuration of a sales management system which illustrates a second embodiment of the invention. This embodiment shows a situation in which merchandise is allocated not only by a merchandise planning entity such as a manufacturer, but also merchandise which is purchased by retailers that are handled as a group***. In the figure, the sales management system 20 is connected to the merchandise distribution management server 10, to the POS terminals installed in each retail store, and to a network, as well as to the supervisor part 40 and to the sales rep part 50.*** The sales management system 20 is designed to handle both merchandise allocated by a merchandise handling entity such as a manufacturer and merchandise which is purchased by retailers, and in addition to the value determination part 22, the allocation quantity calculation part 24, the allocation purchase price calculation part 26, the purchase price at time of sale calculation part 28, and the returned goods settlement amount calculation part 29 as described in Embodiment 1, the system also includes purchased merchandise quantity receiver part 32 and a purchased buying price calculation part 34." *E.g.*, EX1005 (Tamura), ¶[0031]; *see also* EX1005 (Tamura), ¶[0017] ("Fig. 1 is a block diagram of the overall configuration of a sales

management system illustrating a first embodiment of the invention. ***In the figure, the sales management system 20 is connected to a merchandise distribution management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period.*** For example, the server receives sales information from POS terminals at the retail stores, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise distribution management server 10 is also transmitted to the manufacturers' production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer's side, sales department personnel use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as to evaluate the selling capabilities of each retailer."), Figs.1, 3:

Fig. 1

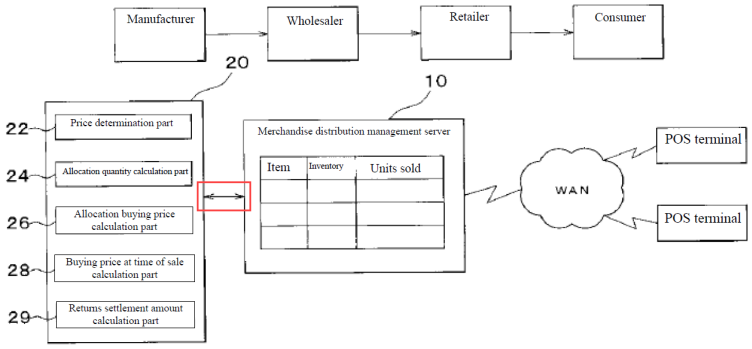
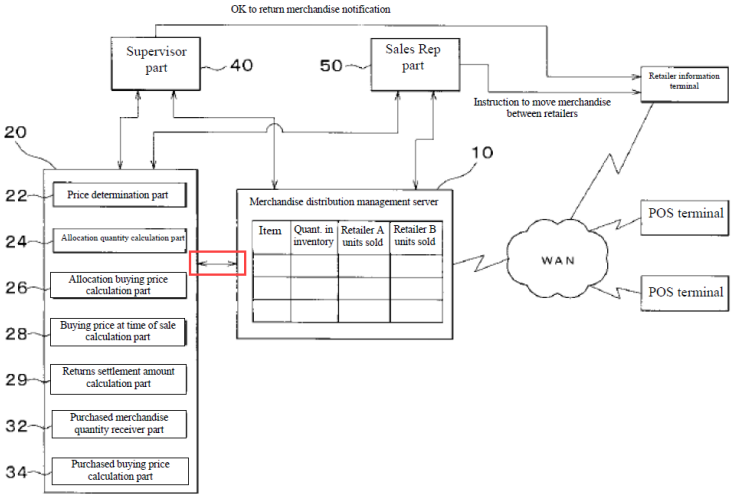


Fig. 3



189. As shown above in Figures 1 and 3, **Tamura discloses that its channel connection interface provides bidirectional communication between a server computer device and a vendor computing device.** Tamura further discloses that "***The supervisor part 40 is authorized to manage the sales of merchandise purchased by the retailers based on the allocation quantities of the merchandise as set by the merchandise planning entity, and to manage the return of***

merchandise purchased by the retailers based on the allocation quantities using, for example, computers or information processing terminals which are connected to a communications network. The supervisor part 40 is connected to a number of sales rep parts 50 within the scope of its management and can adjust the quantity of merchandise allocated to the retailers by the merchandise planning entity at any time based on information from the merchandise distribution management server 10 about the merchandise in question. The supervisor used by the supervisor part 40 is responsible for the sale of merchandise sent in by the merchandising entity; however, it is not responsible for sales performance of unsold merchandise ordered by retailers as merchandise which they have purchased. The supervisor's authority to transfer merchandise between retailers is underpinned by the fact that the allocation quantity of merchandise can be returned to the merchandising entity. In other words, the supervisor also has the authority to approve a retailer's request to return an allocated quantity of merchandise to the merchandising entity." *E.g.*, EX1005 (Tamura), ¶[0034]; *see also* EX1005 (Tamura), ¶[0026] ("Next, the time-of-sale purchase-price calculation unit 28 calculates the sold purchase price, based on the reference retail price, at the stage when the item purchased based on the allocation quantity is sold at each retail store (S108). Each time the item is sold, at each retail store, ***sales information is transmitted from the POS terminal to the***

sales management system 20 and the merchandise distribution management server 10.").

190. Both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. Jacob further discloses receiving sale data such as "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate." *E.g.*, EX1004 (Jacob), ¶¶[0086], [0123]-[0125], [0176], [0192]. As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and uses sale data received from those channels to more efficiently manage inventory and better adapt to market demand (*e.g.*, using Jacob's RezTrip application), and further discloses that the RezTrip application may have multiple "clients" (including, *e.g.*, "Individual Properties, "A group of properties," and "[a] management company or chain that owns several properties"). *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002], [0093]-[0097], [0176], [0180]. Tamura discloses "merchandise distribution management server 10," which performs functions of Tamura's system such as "record[ing] the amount of inventory for each item of

merchandise sold and the number of units sold during a specific unit period," (*e.g.*, EX1005 (Tamura), ¶[0017]), and which POSITA would have understood is a "server computing device." Tamura further discloses a "sales management system 20," which is "installed in," *e.g.*, a "manufacturer's sales department" and includes components to, *e.g.*, determine a reference retail price for" inventory items "based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10" (*e.g.*, EX1005 (Tamura), ¶¶[0018]-[0019]), and which POSITA would have understood is a "vendor computing device." Tamura additionally discloses "sales rep part 50," which "manages the sales progress rate for each retailer" and "has the authority to transfer items from a retailer with a low sales progress rate in relation to the allocation quantity to retailers with a high sales progress rate," (*e.g.*, EX1005 (Tamura), ¶[0035]), and which POSITA would have understood is a "vendor computing device."

191. In my opinion, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Tamura's beneficial teachings of a server computing device (*e.g.*, "merchandise distribution management server 10") and vendor computing devices (*e.g.*, "sales management system 20" and "sales rep part 50")**. Implementing the RezTrip

application on a **server** computing device (such as Tamura's "merchandise distribution server 10") would, *inter alia*, have beneficially provided the additional memory, processing capability, and accessibility by other software/processors that are made possible by servers, thus allowing the combined system to more quickly process and store data and make it available to the "plurality of computers connected to one another" that make up Jacob's disclosed system (as well as to other systems), thus allowing the system to work over a larger system topology with larger data sets (*e.g.*, sale data), to more simply bring in external data for use in its analyses, and to respond more quickly to changing market dynamics, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" (*e.g.*, EX1004 (Jacob), ¶[0002]) and Tamura's express goal of "reducing lost sales opportunities," *e.g.*, EX1005 (Tamura), ¶¶[0001], [0009]). *See also* EX1004 (Jacob), ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace").

192. Additionally, implementing the combined system using Tamura's beneficial teaching of **vendor computing devices** would have enabled personnel of a client/property—*e.g.*, a hotel's administrator, staff, etc.—to connect (including remotely) to the RezTrip computer/server, and thus (using the hotel example for illustrative purposes only), among other things, beneficially: permit multiple hotel chain employees (and multiple hotel chains) in multiple locations to use a single

shared server and database without requiring the RezTrip application and associated data to be replicated and constantly updated in its entirety in many separate locations; enabling the use overall of fewer (or just one) more powerful and faster—and, thus, more costly—computer/server installations running the RezTrip application; and allowing more updates to the RezTrip application and associated components to be done centrally/at fewer installations. Among other things, this would have further increased the system's speed and efficiency in managing property/inventory-related information, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Tamura's express goal of "reducing lost sales opportunities." This would also have beneficially facilitated communication and (to the extent desired and permitted) data sharing between and among Jacob's different owners/administrators of properties/groups of properties, or across properties/groups of properties with a common owner. For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029 (Phillips), 33 ("computerized pricing support system"), 121 ("Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("Throughout the remainder of the 1980s and well into the 1990s, carriers such as

United, Delta, and Continental invested millions of dollars in implementing computerized revenue management systems…."), Fig.6.1.

193. Thus, in my opinion, Jacob (in the recited combinations) in view of Tamura renders obvious this limitation.

194. To the extent it is argued further disclosure of a server computing device or a vendor computing device is required, at minimum, **this would have been obvious from Jacob (in the recited combinations)[11] in view of Kono.**

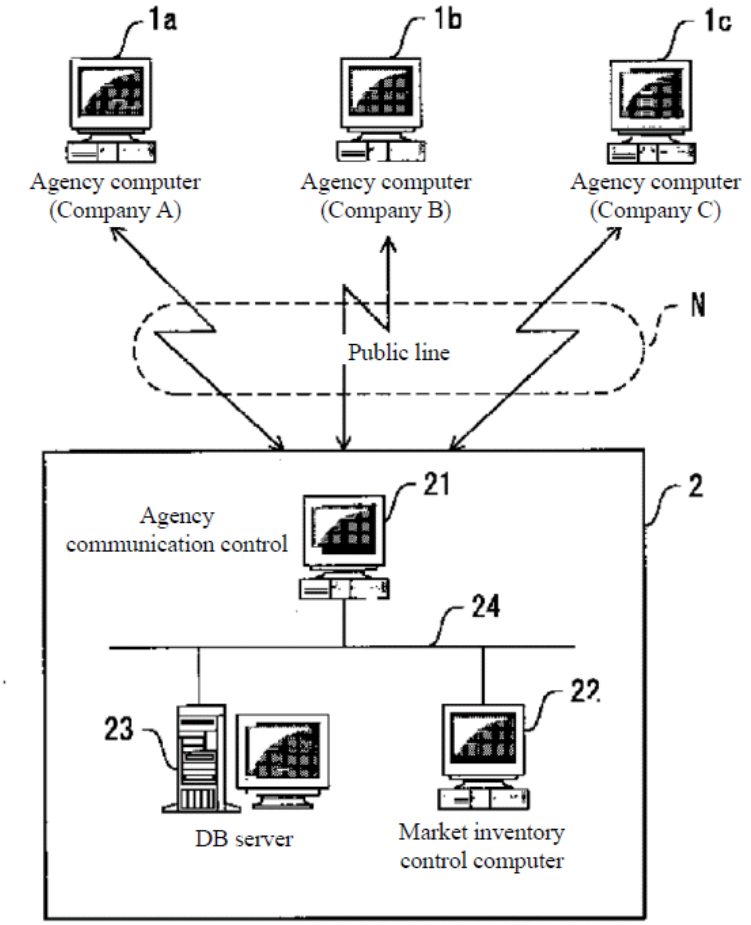
195. **Kono discloses establishing a channel interface** (*e.g.*, portion of "Market inventory control computer" and "DB server"/"database server" enabling communication via "LAN" to "Agency communication control computer") **that provides bidirectional communication** (*e.g.*, "acqui[sition]" of "information" by "DB server"; "acquiring product shipment information from the agency to the retail store and product inventory information of the agency"; "send instructions for product transfer from the maker-side server device") **between at least one server computing device** (*e.g.*, "Agency communication control computer") **and a vendor**

[11] Although I use the phrase "in the recited combinations," this phrase does not refer to a combination of Tamura and Kono except for cl.1[i], cl.4[i], and the dependent claims.

computing device (*e.g.*, "Market inventory control computer" and "DB server" (Fig.1)/"database server")**.**

196. **Kono discloses establishing a channel interface.** For example, as shown in Figure 1, Kono discloses that its "Market inventory control computer" and "DB server"/"database server" communicate via "LAN" to "Agency communication control computer":

[FIG. 1]



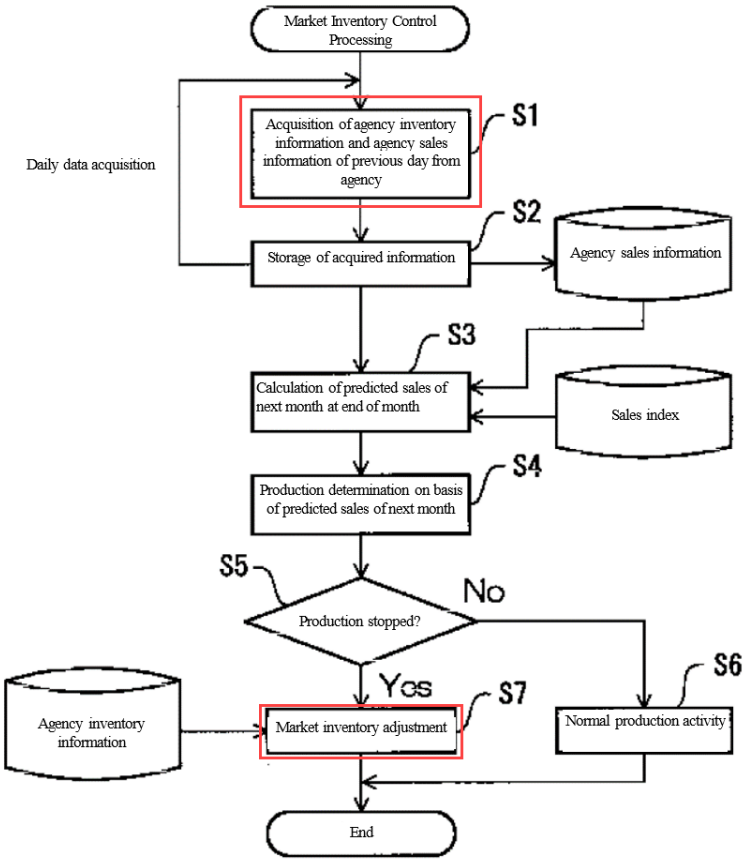
EX1007 (Kono), Fig.1.

197. Kono discloses that its channel interface provides bidirectional communication between its server computing device and vendor computing device. For example, Kono discloses that "[t]his system is configured such that agency terminals 1a, 1b, 1c, ... installed at each agency having transactions and a server device 2 of the manufacturer (maker side) are connected via a network (public line) N. However, the agency terminals 1a, 1b, 1c, ... and the manufacturer server device (hereinafter referred to as the maker-side server device) 2 may be connected by a communication network such as the Internet." *E.g.*, EX1007 (Kono), ¶[0024].

198. In addition, Kono discloses that "Moreover, ***the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like.*** Moreover, the market inventory control computer 22 is provided with: ***acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency*** from each agency terminal 1a, 1b, 1c, ...; analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency; and transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, ***instructing transfer of inventory product from the agency where sales have fallen to the agency that***

still sells, or in the case of the same agency, instructing transfer between warehouses." *E.g.*, EX1007 (Kono), ¶[0025]; *see also* EX1007 (Kono), ¶[0046] ("These may be configured so as to ***send instructions for product transfer from the maker-side server device 2 to the agency-side terminals*** 1a, 1b, 1c, ..., or may be configured so that a sales representative of the maker directly presents the form to prompt transfer of the product. In this case, the agency side simply transfers the product within the normal routine scope of work to be a transfer between warehouses within the company. With regard to resale between different companies, the inventory information of the agency that is collected on a daily basis and the inventory information at each agency such as that illustrated in FIG. 4 are presented, and it is determined whether resale is necessary."), Fig.3:

[FIG. 3]



199. Both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and uses sale data

received from those channels to more efficiently manage inventory and better adapt to market demand (*e.g.*, using Jacob's RezTrip application), and further discloses that the RezTrip application may have multiple "clients" (including, *e.g.*, "Individual Properties, "A group of properties," and "[a] management company or chain that owns several properties"). *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002], [0093]-[0097], [0176], [0180]. Kono discloses "Agency communication control computer," which facilitates communications between Kono's sales channels (*e.g.*, "agencies") and its "DB server" and "Market inventory control computer," (*e.g.*, EX1007 (Kono), ¶[0025]), and which POSITA would have understood is a "server computing device." Kono further discloses a "Market inventory control computer," which, *e.g.*, acquires product shipment information from the agency to the retail store and "performs a sales analysis at each agency," (*e.g.*, EX1007 (Kono), ¶[0025), and which POSITA would have understood is a "vendor computing device." Kono additionally discloses a "DB server," (*i.e.*, "database server"), which stores information such as "agency inventory information," and "agency sales information," (*e.g.*, EX1007 (Kono), ¶[0026], Fig.2), and which POSITA would have understood is a "vendor computing device."

200. In my opinion, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Kono's beneficial**

teachings of a server computing device (*e.g.*, "Agency communication control") and vendor computing devices (*e.g.*, "Market inventory control computer" and "DB server"). Implementing the RezTrip application on a **server** computing device (such as Kono's "Agency communication control") would, *inter alia*, have beneficially provided the additional memory, processing capability, and accessibility by other software/processors that are made possible by servers, thus allowing the combined system to more quickly process and store data and make it available to the "plurality of computers connected to one another" that make up Jacob's disclosed system (as well as to other systems), thereby enabling the system to work over a larger system topology with larger data sets (*e.g.*, sale data), to more simply bring in external data for use in its analyses, and to respond more quickly to changing market dynamics, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" (*e.g.*, EX1004 (Jacob), ¶[0002]) and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" and reducing "unnecessary inventory on the market," *e.g.*, EX1007 (Kono), Summary, ¶[0011]. *See also* EX1004 (Jacob), ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace").

201. Additionally, implementing the combined system using Kono's beneficial teachings of **vendor computing devices** would have enabled personnel of a client/property—*e.g.*, a hotel's administrator, staff, etc.—to connect (including remotely) to the RezTrip computer/server, and thus (using the hotel example for illustrative purposes only), among other things, beneficially: permit multiple hotel chain employees (and multiple hotel chains) in multiple locations to use a single shared server and database without requiring the RezTrip application and associated data to be replicated and constantly updated in its entirety in many separate locations; enabling the use overall of fewer (or just one) more powerful and faster—and, thus, more costly—computer/server installations running the RezTrip application; and allowing more updates to the RezTrip application and associated components to be done centrally/at fewer installations. Among other things, this would have further increased the system's speed and efficiency in managing property/inventory-related information, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" and reducing "unnecessary inventory on the market." This would also have beneficially facilitated communication and (to the extent desired and permitted) data sharing between and among Jacob's different owners/administrators of properties/groups of properties, or across properties/groups of properties with a

common owner. For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029 (Phillips), 33 ("computerized pricing support system"), 121 ("Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("Throughout the remainder of the 1980s and well into the 1990s, carriers such as United, Delta, and Continental invested millions of dollars in implementing computerized revenue management systems…."), Fig.6.1.

202. Thus, in my opinion, Jacob (in the recited combinations) in view of Kono renders obvious this limitation.

c. Element 1[b]

203. Claim 1[b] recites **"storing, via a channel data structure, a channel record for each of a plurality of distribution channels." In my opinion, Jacob (in the recited combinations) discloses or renders obvious this limitation. Alternatively, Jacob (in the recited combinations) in view of Tamura, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.**

204. In my opinion, **Jacob discloses storing** (*e.g.*, "store[]")**, via a channel data structure** (*e.g.*, "database" stored in "computer readable medium"/"hard disk

storage”)**, a channel record** (*e.g.*, record for a channel stored in “database configured to manage hotel data” comprising, *e.g.*, “inventory data,” “availability data,” “audit trail data,” “sales channel data,” “communications data,” and “other data”) **for each of a plurality of distribution channels** (*e.g.*, “sales channels”/“selling channels” (including, *e.g.*, “web sites such as Expedia™, or Travelocity™,” “global distribution systems (GDS’s) such as Apollo™ or Sabre™,” “other computerized reservations systems,” “application used by EU’s to make reservations,” “Internet Merchant Website[],” (Fig.7) “internet web merchant[],” “User Website,” (Fig.7) “major travel reservation systems,” and “hotel’s own website”))**.**

205. **Jacob discloses a plurality of distribution channels**. For example, Jacob discloses that “Today several sales channels are available to hotels as shown in FIGS. 1, 2 and 3. ***Rooms may be booked*** *directly through the hotel’s reservation staff,* ***through the hotel’s web site, through consolidator web sites such as Expedia™ or Travelocity™****, through tour operators,* ***through travel agents using global distribution systems such as Sabre[]™ or Apollo™****, through telephone reservation services providers,* ***and through other computerized reservations systems.*** The wide variety of sales channels has brought great benefits to consumers as well as hotels, however the growth in the number of sales channels has created a sales and inventory management problem.” *E.g.*, EX1004 (Jacob), ¶[0003]; *see also*

EX1004 (Jacob), Fig.3 (showing ***prior art*** systems with internet sales channels such as "LastMinute.com," "Orbitz.com," "Travelocity.com," and "Expedia.com"):

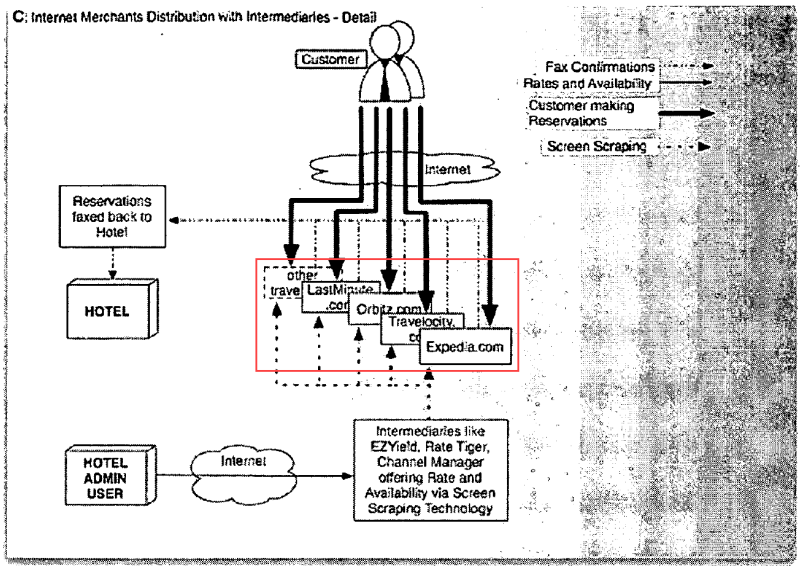


Figure 3

206. Jacob further discloses "The system may be configured to communicate with the hotel staff, the hotel property management database, and a ***plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™,*** *telephone reservation systems,* ***a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems,*** *and tour operators*. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute

information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." *E.g.*, EX1004 (Jacob), ¶[0007].

207. In addition, Jacob discloses "As used herein a GDS, or Global Distribution System, is a term used for major travel reservation systems (such as Apollo™, Sabre™, Worldspan™) which have a worldwide presence and were originally designed to provide reservations for the airline industry. Approximately 500,000 travel agents have access to these systems, which have been extended to allow bookings for the hotel/travel industry…. As used herein End User, or EU refers to the users who come to a Property website, search for rooms, and optionally make a reservation. An EU may be a hotel customer or a travel agent using a GDS, a tour operator, a telephone reservation center worker, or other person using the system to make a reservation." *E.g.*, EX1004 (Jacob), ¶[0063]; *see also* EX1004 (Jacob), ¶[0077] ("As used herein a Sales Channel or Selling Channel refers to a wholesale or retail selling channel. Sales channels may comprise GDS system, telephone reservations systems, tour operators, ***hotel web sites***, ***consolidator web sites such as Expedia™ or Travelocity™.***"), [0071] ("***As used herein the Reservation Engine, Bookings Engine, and RezTrip™ Reservation Application refer to an application used by EU's to make reservations.*** One embodiment of the invention, RezTrip™, comprises a reservation engine for use by EUs, and an administrative application for use by hotel owners/employees.") [0085] ("The

system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described."), Fig.7:

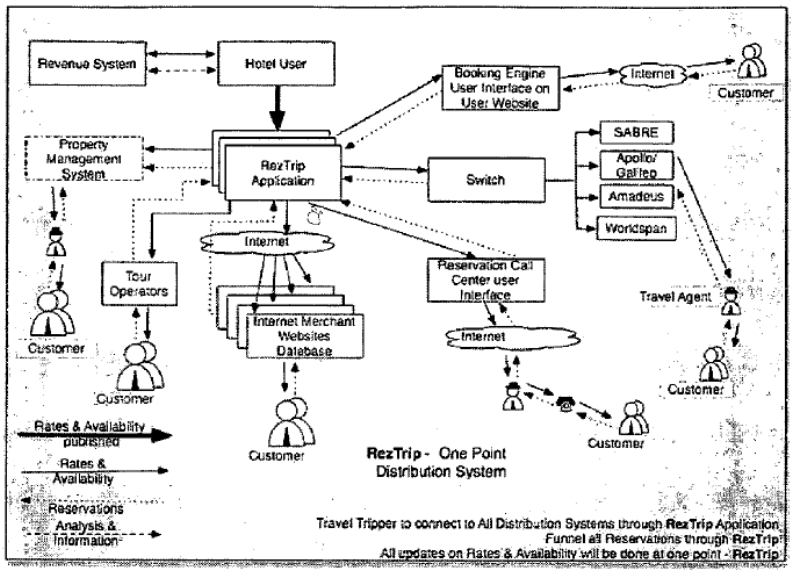


Figure 7

208. **Jacob discloses storing, via a channel data structure, a channel record for each of its plurality of distribution channels.** For example, Jacob discloses "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an

analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. ***The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" *E.g.*, EX1004 (Jacob), ¶[0006]; *see also* EX1004 (Jacob), ¶[0082] ("***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type

hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels**.** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input

device, voice input, or stylus input."), [0083] ("***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk.").

209. Jacob further discloses a computerized database that stores, for example, "sales channel data," "inventory data," and "other data": "***Embodiments of the invention comprise a computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's,

and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." *E.g.*, EX1004 (Jacob), ¶[0084]; *see also* EX1004 (Jacob), cl.1 ("A hotel pricing and inventory management system comprising: ***a database configured to manage hotel data***; a code segment configured to manage user interaction; a code segment configured to manage portal data; a code segment configured to manage property data; a code segment configured to manage room type data; a code segment configured to manage room hierarchy data; a code segment configured to manage rate type data; a code segment configured to manage rate grid data; a code segment configured to communicate with a plurality of selling channels.").

210. Jacob expressly discloses this limitation. For example, Jacob discloses an inventory management and distribution system that stores—in, *e.g.*, a "computerized…relational database[]"—the system's data, including *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data." *E.g.*, EX1004 (Jacob), ¶[0084]. Jacob further discloses that its system comprises code segments (stored on, *e.g.*, "a computer readable medium," (*e.g.*, EX1004 (Jacob), ¶[0082])) to, *e.g.*, "communicate with other systems, such as sales systems (sales channels)" (*e.g.*, EX1004 (Jacob), ¶[0084]), such as "web sites"/"Internet Merchant

Website"/"internet web merchants"/a "hotel's own website" (*e.g.*, EX1004 (Jacob), ¶¶[0007], [0077], [0085], Fig.7). Jacob further discloses that its, *e.g.*, RezTrip computer/server is "configured to run on general purpose computers," that its general purpose computers include "hard disk storage," and that its system "comprises a computerized database" (*e.g.*, EX1004 (Jacob), ¶¶[0083]-[0084]), that its system communicates, *inter alia*, "pricing and inventory information to the sales channels" (*e.g.*, EX1004 (Jacob), ¶[0185]), and that its system receives and processes information from the channels to make channel-specific determinations over time, *e.g.*, "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels" (*e.g.*, EX1004 (Jacob), ¶[00180], cls.1[h]-[i], 2).

211. In my opinion, **POSITA would thus have understood that Jacob expressly discloses that its system stores, via a channel data structure (including, *e.g.*, as data accessible in a "relational database[]"), a channel record for *each* of a plurality of distribution channels.** At minimum, **POSITA would have understood that Jacob's RezTrip computer/server necessarily, and thus inherently, stores, via a channel data structure, a channel record for each of a plurality of distribution channels, to facilitate computerized storage in Jacob's disclosed databases of channel-specific information to which it requires access over time (*e.g.*, to determine "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels"), and to facilitate communications**

with Jacob's plurality of distribution channels, including the storage and communication of pricing and inventory information over, *e.g.*, "wired or wireless networks."

212. To the extent it is argued that further disclosure is required, in my opinion, **POSITA would at minimum have found it obvious, straightforward, and advantageous to implement Jacob's disclosed RezTrip computer/server (in the recited combinations) such that it stores, via a channel data structure, a channel record for *each* of a plurality of distribution channels.** This would have, *e.g.*, facilitated consistent, automatic storage and more accurate tracking of, *e.g.*, initial inventory allocations, and ongoing reallocations and sales and inventory levels, and storing and modifying of pricing information and other data by, *e.g.*, the RezTrip computer/server, as well as facilitated efficient and automatic communication of such data to Jacob's plurality of sales channels (and receipt of data from such channels), thereby furthering Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" while minimizing the data entry required by, *e.g.*, hotel staff and "insur[ing] that each sales channel would always be working with the most up-to-date pricing, availability, *e.g.*, EX1004 (Jacob), ¶¶[0002], [0005], [0010], [0154] ("A property does its bookings through various channels…in order to maximize occupancy rate and maximize room rate."). It

would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

213. Thus, in my opinion, Jacob (in the recited combinations) discloses or renders obvious this limitation.

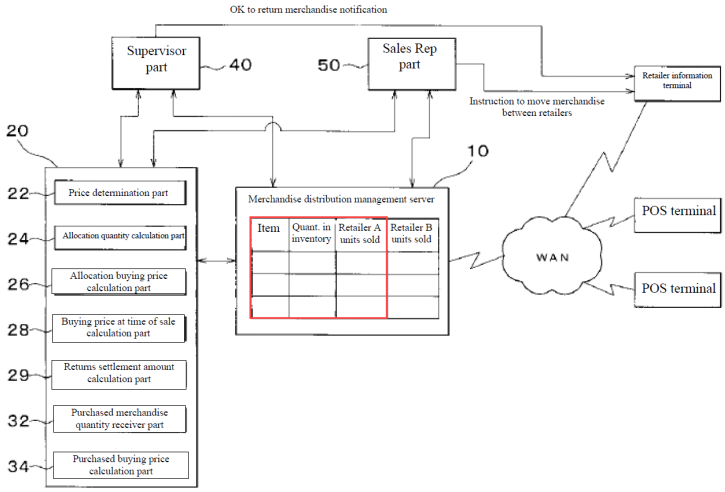
214. To the extent it is argued further disclosure of storing, via a channel data structure, a channel record for ***each*** of a plurality of distribution channels is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Tamura.**

215. **Tamura discloses storing** (*e.g.*, "stor[ing]"; "recording")**, via a channel data structure** (*e.g.*, data stored on "merchandise distribution management server"/"sales management system")**, a channel record** (*e.g.*, "merchandise distribution information"/"figures stored in the merchandise distribution management server" comprising, *e.g.*, "item," "quant. in inventory," (Fig.3) "Retailer A units sold," (Fig.3) "Retailer B units sold" (Fig.3)) **for each of a plurality of distribution channels** (*e.g.*, "retailers") (*see* Fig.3)**.**

216. **Tamura discloses a plurality of distribution channels.** For example, Tamura discloses "Fig. 1 is a block diagram of the overall configuration of a sales management system illustrating a first embodiment of the invention. ***In the figure, the sales management system 20 is connected to a merchandise distribution***

management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period. For example, the server receives sales information from POS terminals at the retail stores, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise distribution management server 10 is also transmitted to the manufacturers' production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer's side, sales department personnel use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as to evaluate the selling capabilities of each retailer." *E.g.*, EX1005 (Tamura), ¶[0017]; *see also* EX1004 (Jacob), Fig.7:

Fig. 3

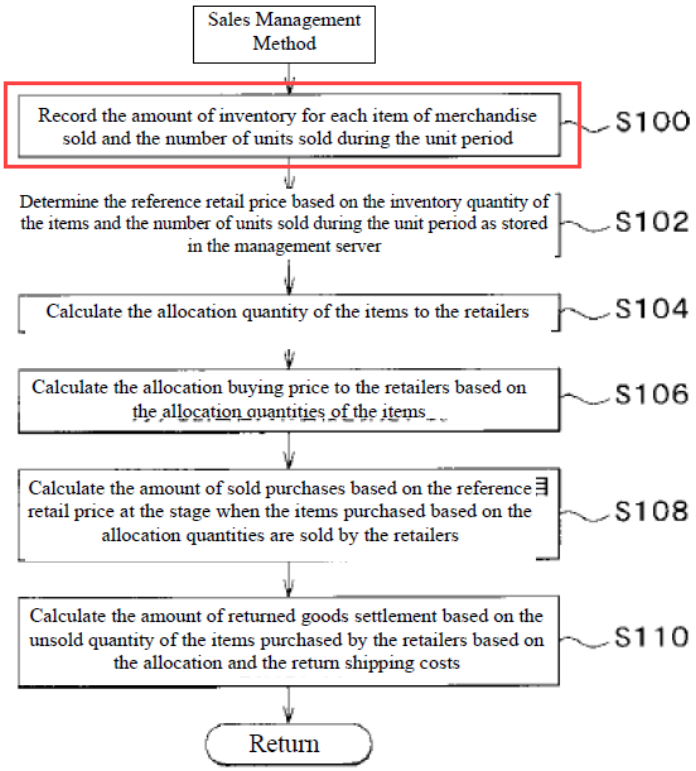


217. **Tamura further discloses storing, via a channel data structure, a channel record for each of its plurality distribution channels.** For example, Tamura discloses "The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step***: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100); a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are

sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." *E.g.*, EX1005 (Tamura), ¶[0014].

218. Tamura discloses storing data including inventory quantity, retailer identity, and number of units sold during the unit period by each retailer: "Next, the price determination part 22 sets a reference retail price ***based on the inventory quantity of the item in question and the number of units sold during the unit period as stored in the merchandise distribution management server 10*** (S102). The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based on the allocation buying price and the allocation quantity of the item." *E.g.*, EX1005 (Tamura), ¶[0025]; *see also* EX1005 (Tamura), Fig.2:

Fig. 2



219. Tamura further discloses "The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10.*** For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude

toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and with reference to the merchandise's distribution market." *E.g.*, EX1005 (Tamura), ¶[0019].

220. In addition, Tamura discloses, *e.g.*, "A sales management system comprising: a price determination part that determines the reference retail price of an item for sale ***based on the inventory and the number of items sold during the unit period for each item for sale, which is stored in a merchandise distribution management server***; an allocated quantity calculation part that calculates the allocated quantity of the items for each retailer; an allocated stocking price calculation part that calculates the allocated stocking price for each retailer based on the allocated quantity of the item calculated by the allocated quantity calculation part; a time of sale stocking price calculation part that calculates the stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and a returned goods settlement amount calculation part that calculates the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity." *E.g.*, EX1005 (Tamura),

cl.1; *see also* EX1005 (Tamura), cl.5 ("A sales management method for executing each step using a computer: ***recording the inventory and the number of units sold during the unit period for each item of merchandise for sale***; determining the reference retail price based on the inventory and the number of units sold during the unit period of the item as stored in the management server; calculating the allocated quantity of the items for each retailer; calculating the allocated stocking price of the items for each retailer based on the allocated quantity of the items; calculating stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and calculating the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity."), ¶[0020] ("The allocation quantity calculation part 24 calculates the allocation quantity of the item for each retailer. In principle, the quantity to be allocated is determined based on the actual sales of each item sold by each retailer as stored in the merchandise distribution management server 10, but regional factors and customer base are also taken into consideration. For example, a 10% increase is determined based on regional factors, and a further 5% increase is determined based on the customer base. As a result, each retailer will, in principle, purchase merchandise in accordance with the allocation determined by the allocation calculation part 24. The incentive for retailers is to purchase more merchandise if

they find that the merchandise is a strong seller. However, since the number of orders placed by retailers is not accepted for the allocated merchandise, retailers need to constantly improve their sales performance and ensure that the figures stored in the merchandise distribution management server 10 are good.").

221. Both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. And, as discussed, Jacob discloses an inventory management and distribution system that stores, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data" (*e.g.*, EX1004 (Jacob), ¶[0084]), and that its system comprises code segments to, *e.g.*, "communicate with other systems, such as sales systems (sales channels)" (*e.g.*, EX1004 (Jacob), ¶[0084]), including, *e.g.*, "web sites"/"Internet Merchant Website"/"internet web merchants"/a "hotel's own website." *E.g.*, EX1004 (Jacob), ¶¶[0084], [0007], [0077], [0085], Fig.7. Jacob further discloses that its system (*e.g.*, running the "RezTrip" application) is "configured to run on general purpose computers," that its system "comprises a computerized database" (*e.g.*, EX1004 (Jacob), ¶[0084]), that its system

communicates, *inter alia*, "pricing and inventory information to the sales channels" (*e.g.*, EX1004 (Jacob), ¶[0185]), and that its system receives and processes information from the channels to make channel-specific determinations over time, *e.g.*, "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels" (*e.g.*, EX1004 (Jacob), ¶[00180], cls.1[h]-[i], 2). Tamura discloses "recording," on "merchandise distribution management server"/"sales management system" channel records, "the amount of inventory for each item of merchandise sold" by each of Tamura's retailers (*e.g.*, "Retailer A," "Retailer B") and other "merchandise distribution information." *E.g.*, EX1005 (Tamura), ¶¶[0014], [0017], Figs.2-3.

222. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management and distribution system (in the recited combinations) using Tamura's beneficial teachings of storing, via a channel data structure, a channel record for *each* distribution channel.** This would have, *e.g.*, allowed the resulting system to consistently and automatically store and accurately track, *e.g.*, inventory allocations, the number of reservations booked, the prices at which such reservations were booked, remaining inventory, and other data, as well as to efficiently and automatically communicate such data and receive data from Jacob's plurality of sales channels, thereby furthering Jacob's express goals of

"[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" while minimizing the data entry required by, *e.g.*, hotel staff and "insur[ing] that each sales channel would always be working with the most up-to-date pricing, availability, and other information, (*e.g.*, EX1004 (Jacob), ¶¶[0002], [0005], [0010], [0154] ("A property does its bookings through various channels…in order to maximize occupancy rate and maximize room rate.")), and Tamura's express goals of "reducing lost sales opportunities" and "eliminating a great deal of waste in the distribution process." *E.g.*, EX1005 (Tamura), ¶¶[0001], [0015]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

223. Thus, in my opinion, Jacob (in the recited combinations) in view of Tamura renders obvious this limitation.

224. Alternatively, to the extent it is argued further disclosure of storing, via a channel data structure, a channel record for ***each*** of a plurality of distribution channels is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Kono.**

225. **Kono discloses storing** (*e.g.*, "acquired product sales information," "product inventory information" "is stored")**, via a channel data structure** (*e.g.*,

"agency inventory information database"; "agency sales (shipping) information database"; "form for performing an inventory analysis")**, a channel record** (*e.g.*, record for an agency comprising, *e.g.*, "agency sales information"; "agency inventory information") **for each of a plurality of distribution channels** (*e.g.*, "agencies") (*see* Fig.4)**.**

226. **Kono discloses a plurality of distribution channels.** For example, Kono discloses "agencies": "Moreover, according to the market inventory control method of the present information, in the third stage, when transferring inventory product between agencies, a response is made by resale of the inventory product from the agency where sales have fallen to the agency that still sells, and only the distribution cost required for resale is borne by the manufacturer." *E.g.*, EX1007 (Kono), ¶[0020].

227. **Kono further discloses storing, via a channel data structure, a channel record for each of a plurality of distribution channels.** For example, Kono discloses "According to the present invention having such characteristics, by connecting the manufacturer server device and the terminals of each agency by a direct network, ***the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each agency in real time***. The manufacturer server device estimates the sales volume of the product on the overall

market based on the acquired product shipment information of each agency and monthly sales index data of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, transfer (resale, etc.) of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." *E.g.*, EX1007 (Kono), ¶[0010].

228. Kono further discloses "According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network***, can acquire product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time***. The maker estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and sales index of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." *E.g.*, EX1007 (Kono), ¶[0014].

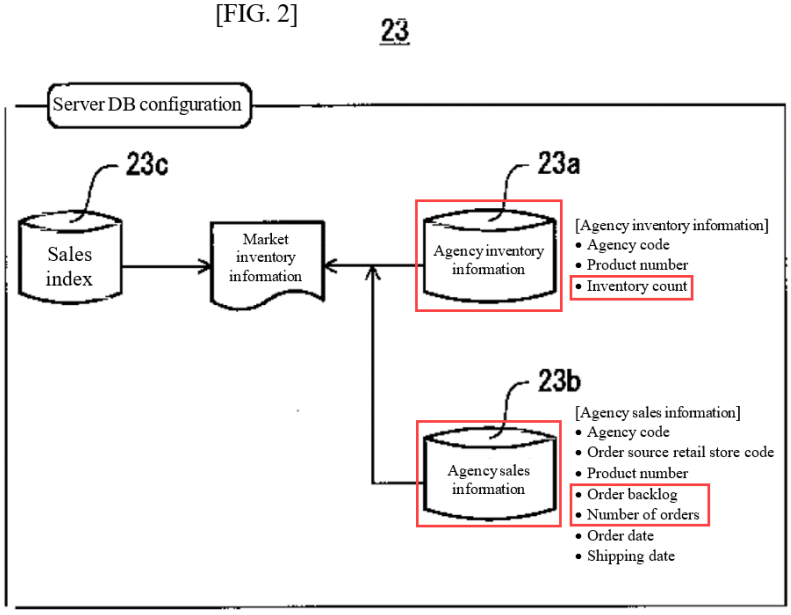
229. Kono additionally discloses "***A maker-side server device 2 acquires, on a daily basis, product shipping (sales) information of the day before from the***

agency to the retail store and product inventory information of the day before of the agency from each agency terminal 1a, 1b, 1c, ... (step S1). The acquired product sales information is stored in the agency sales information database 23b of the database server 23, and the product inventory information is stored in the agency inventory information database 23a of the database server 23 (step S2). In this manner, daily information is stored and, at the end of the month, the maker-side server device 2 calculates the predicted sales volume of the next month (step S3). This calculation is as already described above. Thereafter, on the basis of the calculated predicted sales volume for the next month, a determination is made as to whether to perform or stop production of the product (steps S4, S5). The determination criterion at this time is determined by whether the predicted sales volume is on a decreasing trend and the sales volume matches the production cost. As a result, if even one of these conditions is resolved (if No is determined at step S5), the operation proceeds to step S6, and normal production activity is performed as before." *E.g.*, EX1007 (Kono), ¶[0039]; *see also* EX1007 (Kono), ¶¶[0026] ("FIG. 2 illustrates an example of various databases controlled by the database server 23. Three kinds of databases controlled by the database server 23 are prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory

information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the agency sales information database 23b. Moreover, ***monthly sales indexes of the previous year and current year are saved in the sales index database 23c***. In the database server 23, these data are updated daily so that ***the data can be stored and analyzed***. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software."), [0009] ("[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, ***the manufacturer server device is provided with***: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; ***analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency***; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses. Moreover, the above configuration is further

provided with: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and the ***sales index of each agency stored in the agency shipment information database*** and the sales index database, estimate the sales volume of the product on the overall market and ***performs a sales analysis at each agency***."), Figs.2, 4:

[FIG. 2]



[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

230. Kono further discloses analyzing, *e.g.*, the stored inventory and sales data: "Moreover, the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like. Moreover, the market inventory control computer 22 is provided with: acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency from each agency terminal 1a, 1b, 1c, ...; ***analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency***; and ***transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instructing transfer between warehouses." *E.g.*, EX1007 (Kono), ¶[0025];

see also EX1007 (Kono), cl.2 ("The market inventory control system according to claim 1, further comprising: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and ***the sales index of each agency stored in the agency shipment information database and the sales index database***, estimate the sales volume of the product on the overall market and performs a sales analysis at each agency."), Brief Description of Drawings ("An explanatory diagram illustrating an example of a form for performing an inventory analysis of an agency.").

231. Both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). And, as discussed, Jacob discloses an inventory management and distribution system that stores, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data" (*e.g.*, EX1004

(Jacob), ¶[0084]), and that its system comprises code segments to, *e.g.*, "communicate with other systems, such as sales systems (sales channels)," including, *e.g.*, "web sites"/"Internet Merchant Website"/"internet web merchants"/a "hotel's own website." *E.g.*, EX1004 (Jacob), ¶¶[0084], [0007], [0077], [0085], Fig.7. Jacob further discloses that its "RezTrip" system is "configured to run on general purpose computers," that its system "comprises a computerized database" (*e.g.*, EX1004 (Jacob), ¶[0084]), that its system communicates, *inter alia*, "pricing and inventory information to the sales channels" (*e.g.*, EX1004 (Jacob), ¶[0185]), and that its system receives and processes information from the channels to make channel-specific determinations over time, *e.g.*, "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels" (*e.g.*, EX1004 (Jacob), ¶[00180], cls.1[h]-[i], 2). Kono discloses acquiring and storing "product sales information," and "product inventory information" and records for each agency comprising, *e.g.*, "agency sales information" and "agency inventory information" in an "agency information database" including an "agency sales (shipping) information database" and in a "form for performing an inventory analysis." *E.g.*, EX1007 (Kono), ¶¶[0009], [0026], Figs.1-4.

232. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed**

inventory management and distribution system (in the recited combinations) using Kono's beneficial teachings of storing, via a channel data structure, a channel record for *each* distribution channel. This would have, *e.g.*, allowed the resulting system to consistently and automatically store and accurately track, *e.g.*, inventory allocations, the number of reservations booked, the prices at which such reservations were booked, remaining inventory, and other data, as well as to efficiently and automatically communicate such data and receive data from Jacob's plurality of sales channels, thereby furthering Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" while minimizing the data entry required by, *e.g.*, hotel staff and "insur[ing] that each sales channel would always be working with the most up-to-date pricing, availability, and other information, EX1004 (Jacob), ¶¶[0002], [0005], [0010], [0154] ("A property does its bookings through various channels…in order to maximize occupancy rate and maximize room rate."), and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" (Kono Summary) and reducing "unnecessary inventory on the market," EX1007 (Tamura), ¶¶[0011], [0015], [0017]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

233. Thus, in my opinion, Jacob (in the recited combinations) in view of Kono renders obvious this limitation.

d. Element 1[c]

234. Claim 1[c] recites **"receiving, from the vendor computing device through the channel interface, a selection, from the plurality of distribution channels, of one or more participant channels for a transportation service." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation. Alternatively, in my opinion, Jacob in (the recited combinations) in view of Evangelist renders obvious this limitation.**

235. In my opinion, **Jacob discloses receiving** (*e.g.*, receiving from "user interaction code segment")**, from the vendor computing device** (*see* cl.1[a]) **through the channel interface** (*see* cl.1[a])**, a selection** (*e.g.*, vendor's "[]allocat[ion]… to the… channel"[12])**, from the plurality of distribution channels**

[12] Jacob teaches allocating or "allott[ing]" inventory for various purposes, including, *e.g.*, to specific "Rate Types" and "Date Range[s]" (*e.g.*, EX1004 (Jacob), ¶[0189] ("Information comprising… inventory allotment… may be entered."), Fig.40 ("Change Allotment," "Allotment Date Range")), and also to different ***distribution channels*** (*e.g.*, EX1004 (Jacob), ¶[0180] ("reallocate inventory to the

(*see* cl.1[b])**, of one or more participant channels for a transportation service** (*e.g.*, particular "sales channel"/"selling channel"/"Internet Merchant[]" (Fig.7)/"internet web merchant"/"User Website" (Fig.7) through which "reservation" is "made"; "sales channel" that is "selling"; *see* cl.1[b])**.**

236. For example, and as discussed above, Jacob discloses a plurality of selling channels: "The system may be configured to communicate with the hotel staff, the hotel property management database, and a ***plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™,*** *telephone reservation systems,* ***a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems,*** *and tour operators*. The system allows hotel users to log into the system, check current room pricing and

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better-selling channel")). Jacob thus discloses or at minimum renders obvious selecting one or more participant channels for a transportation service. As discussed *infra* (following cl.1[c]), in my opinion, POSITA would have recognized Jacob's explicit disclosure of "**reallocat[ing]** inventory to the better-selling channel" as disclosing making changes to an *already-existing, original selection of one or more participant channels/allocation of inventory* among channels (or at minimum would have found such an original allocation was necessarily, and thus inherently, disclosed). *See, e.g.*, EX1004 (Jacob), Fig.7.

inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." *E.g.*, EX1004 (Jacob), ¶[0007].

237. Jacob further discloses: "As used herein a GDS, or Global Distribution System, is a term used for major travel reservation systems (such as Apollo™, Sabre™, Worldspan™) which have a worldwide presence and were originally designed to provide reservations for the airline industry. Approximately 500,000 travel agents have access to these systems, which have been extended to allow bookings for the hotel/travel industry. [] As used herein End User, or EU refers to the users who come to a Property website, search for rooms, and optionally make a reservation. An EU may be a hotel customer or a travel agent using a GDS, a tour operator, a telephone reservation center worker, or other person using the system to make a reservation." *E.g.*, EX1004 (Jacob), ¶[0063].

238. In addition, Jacob discloses, for example: "As used herein a Sales Channel or Selling Channel refers to a wholesale or retail selling channel. Sales channels may comprise GDS system, telephone reservations systems, tour operators, ***hotel web sites***, ***consolidator web sites such as Expedia™ or Travelocity™.***" *E.g.*, EX1004 (Jacob), ¶[0077].

239. Jacob further discloses that, *e.g.*, RezTrip clients (*e.g.*, Properties) communicate with the RezTrip application by, among other things providing room "Rates & Availability," as shown below in Figure 7: "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described." EX1004 (Jacob), ¶[0085]; *see also* EX1004 (Jacob), Fig.7:

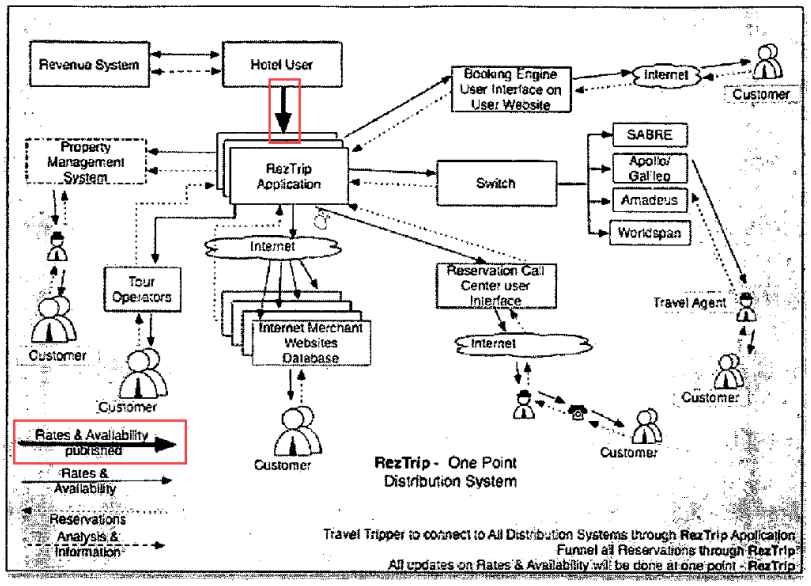


Figure 7

240. In addition, Jacob discloses that, *e.g.*, users at each Property perform initial setup of each property, including by setting up inventory and room rates: "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The data relating to the Property are stored in the system database. The EA or SU then associates a PA with the property. The ***PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies***, and later by managing inventory and room rates. Once the ***PA has set up the Property within the system***, EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation. ***After an EU has made a reservation,***

confirmation information is sent to both the EU as well as the Property." *E.g.*, EX1004 (Jacob), ¶[0086].

241. Jacob further discloses that its system receives information from sales channels, including reservation confirmations, and analyzes such information: "In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations. ***The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations***." *E.g.*, EX1004 (Jacob), ¶[0009]; *see also* EX1004 (Jacob), ¶¶[0010] ("The system may further comprise a revenue management code segment. The revenue management code segment is used to analyze ***the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue."), [0071] ("***As used herein the Reservation Engine, Bookings Engine, and RezTrip™ Reservation Application refer to an application used by EU's to make reservations.*** One embodiment of the invention, RezTrip™, comprises a reservation engine for use by EUs, and an administrative application for use by hotel owners/employees.").

242. Jacob also discloses that its system "reallocate[s] inventory" after performing its initial allocation: "***If a sales channel's Room Type inventory is sold out or is selling better than other channels***, the PA might choose to ***reallocate***

inventory to the better-selling channel. Alternatively, the PA may choose to close the Rate Type/Room Type, for a given date or a series of dates, for certain channels." *E.g.*, EX1004 (Jacob), ¶[0180].

243. Additionally, Jacob discloses that, among other things, such information (including allocations and reallocations) is stored by Jacob's system and communicated to the plurality of distribution channels by Jacob's, *e.g.*, "computer program systems configured to manage the data and perform the methods/functions of the invention." For example: "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an

engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. ***Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser.*** User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082].

244. Jacob expressly discloses that under various circumstances a property's "PA ["Property Administrator" (*e.g.*, EX1004 (Jacob), ¶[0066])] might choose to

reallocate inventory to the better-selling channel" (EX1004 (Jacob), ¶[0180]), and allocating/"allott[ing]" inventory for various purposes (*e.g.*, EX1004 (Jacob), ¶[0189] (specific "Rate Types," "Date Range[s]"), Fig.40), including to different ***distribution channels*** (*e.g.*, EX1004 (Jacob), ¶[0180]).

245. In my opinion, **POSITA would have understood this to be an express disclosure that personnel associated with a Property (such as a hotel) in Jacob have—by communicating with the RezTrip computer/server through a vendor computing device (*see* cl.1[a])—previously performed an *allocation* of inventory (*i.e.*, a selection of one or more participant channels) to each distribution channel prior to "*re*allocat[ing]" such inventory and that such allocation was thus received from the vendor computing device**.[13] *See, e.g.*, EX1004 (Jacob), ¶[0086] (describing that "The EA or SU… associates a PA with the property. The ***PA administers the property, initially by entering relevant Property information***…. Once the ***PA has set up the Property within the system***, EUs may connect to the reservation engine… and make a reservation"). The fact that a Property's personnel perform this allocating/selecting by connecting to the RezTrip computer/server from

[13] Similarly, Jacob also teaches defining "room constraints" for various purposes, including constraints as to specific "Rate Types" and "room types" (*e.g.*, EX1004 (Jacob), ¶¶[0008], [0162], Figs.5, 6).

their vendor computing device is further confirmed by the fact that Jacob discloses the RezTrip computer/server *communicating*—to each channel—*information about* this allocation to each channel and about the inventory allocated. *See, e.g.*, EX1004 (Jacob), ¶¶[0154], [0086] ("Once the PA has set up the Property within the system, EUs may connect to the reservation engine [RezTrip computer/server], either directly or through intermediaries, select a room, and make a reservation. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property"), [0180]-[0181], [0185] ("Frequent updating and communication of pricing and inventory information to the sales channels"), [0191] ("Once the Rate Types, Room Types, and inventory have been managed… the pricing information, inventory information, and other information is communicated to the selling channels"), cls.5&6 ("code segment configured to communicate pricing information and inventory information to a plurality of [sales/selling] channels"), Fig.7 ("Rates and Availability" provided to each "Internet Merchant Website Database," "Booking Engine User Interface on User Website," etc., and then to each of their respective "Customer[s]" *for the inventory available from each such channel*). Alternatively, POSITA would at minimum have recognized that in order to "***reallocate*** inventory to the better-selling channel" Jacob necessarily, and thus inherently, allocates such inventory/selects a distribution channel prior to "reallocat[ing]." This must be the case, as without an initial "allocation" there could be no "reallocat[ing]." Further,

POSITA would have recognized Jacob's disclosure of "**reallocat[ing]** inventory to the better-selling channel" as disclosing making changes to an *already-existing original allocation of inventory* among channels (or at minimum would have found such an original allocation was necessarily, and thus inherently, disclosed).

246. To the extent, *arguendo*, further disclosure is required, in my opinion, **POSITA would at minimum have found it obvious, straightforward, and advantageous to implement Jacob's (in the recited combinations) disclosed "transportation services inventory" and "plurality of distribution channels" using Jacob's beneficial teachings of "reallocat[ing] inventory" such that Jacob's vendor computing device (*see* cl.1[a]) performs an allocation (*i.e.*, selection) of each item of Jacob's transportation services inventory to a distribution channel**. This would have, *e.g.*, beneficially allowed personnel associated with a Property (such as a hotel) in Jacob to make an initial allocation of inventory—by communicating with the RezTrip computer/server through a vendor computing device—to certain selected/preferred distribution channels, including to distribution channels that better suit the needs of the transportation services inventory provider or that are deemed to have a greater likelihood of selling inventory of a particular type or on a particular date at a higher price or in higher quantities than other distribution channels, thereby furthering Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent

inventory" by "tak[ing] advantage of many different sales channels." EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.[14]

[14] As discussed (*e.g.*, in §V), and as is true for the other Grounds herein, as well, POSITA's reasonable expectation of success here is further confirmed by this technology's predictability, as confirmed by, *e.g.*, similar systems known to POSITA. *See, e.g.*, EX1026 (Choi), 1-2 ("[t]he potential to reduce distribution costs using internet channels has made hotel managers more conscious of the need to ***maximize contributions to gross profit (revenue less distribution costs)*** rather than just the revenue obtained from a given room sale. In addition to ***considering rate and timing of sales***, hotel managers must evaluate the ***effects of distribution-channel management*** on their current revenue-management practices ["selling the right inventory to the right customer for the right price at the right time"] and determine how to benefit from it."), 3-4 ("A reasonable proposition is that ***it is most beneficial for hotels to book reservations through the least-expensive channels, if there***

247. Thus, in my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.

248. To the extent it is argued further disclosure of allocating/selecting is required, **POSITA would have found it obvious based on Jacob (in the recited combinations) in view of Evangelist.**

249. **Evangelist discloses receiving a selection, from a plurality of distribution channels, of one or more participant channels for inventory** (*e.g.*, "Controller" "allocat[es] a first portion of inventory for on-line fulfillment to a particular inventory location"/"allocate[s] inventory for… on-line… fulfillment" to, *e.g.*, "Web site that accepts requests for delivery of movies to customers," "store" or "on-line… channels"/"initially designate[s]" as "on-line inventory" of "store" or

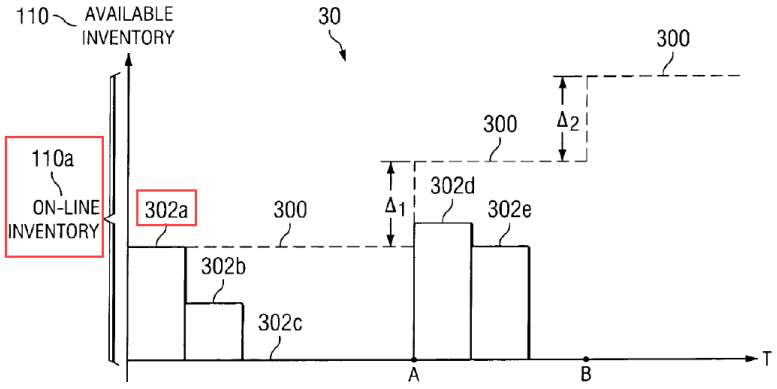
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is sufficient demand via those channels. To ***manage revenue by distribution channel***, revenue-management forecasting and optimization models must be revised to consider the relevant information"), 8 (""hotels with a small gap between room rates and a wide range of distribution costs are likely to attain a larger benefit from the extended method" of revenue forecasting for inventory allocation using "rate, length of stay, ***and distribution channel***").

"on-line… channel"; "Controller… initially allocates inventory… to… stores"; "allocates inventory")**.**

250. For example, Evangelist expressly discloses that its system (*e.g.* "Controller") "allocate[s] a first portion of inventory for on-line fulfillment to a particular inventory location": "A method performed on a computer for fulfilling a media request, comprising: allocating a first portion of inventory for on-line fulfillment to a particular inventory location; allocating a second portion of inventory for in-store fulfillment to the particular inventory location; determining in-store rental activity of the second portion of inventory, wherein determining in-store rental activity comprises: determining a protected in-store rental activity of the second portion of inventory based on past in-store rental activity; determining an actual in-store rental activity of the second portion of inventory; and comparing the protected in-store rental activity and the actual in-store rental activity to determine whether to reallocate the first and second portions of inventory; reallocating the first and second portions of inventory in accordance with the determined in-store rental activity; receiving, at a computer, a media request associated with a subscriber account; and selecting, by the computer, one of a plurality of inventory locations to fulfill the media request, wherein at least one of the inventory locations accommodates in-store media rental requests." *E.g.*, EX1010 (Evangelist), cl.1. *see also* EX1010 (Evangelist), cls.9-10, 18-19, 22-23, Fig.3:

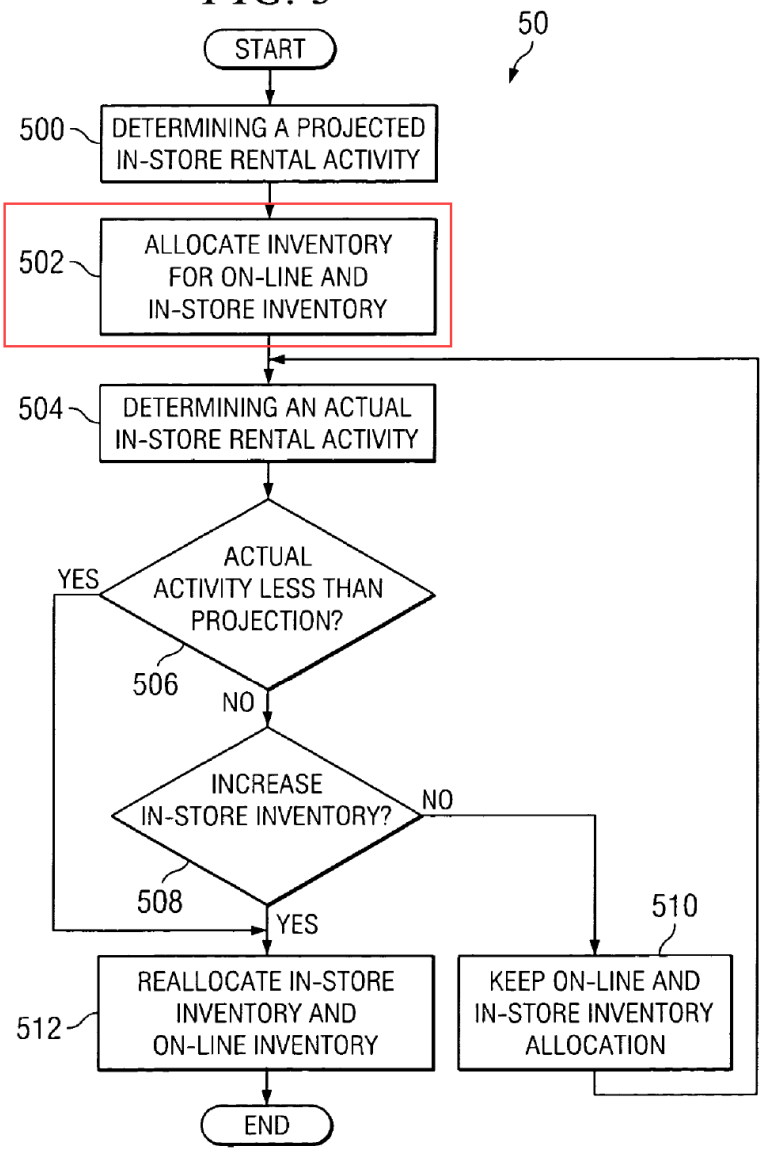
FIG. 3



251. Evangelist further discloses that it performs inventory allocations based on *e.g.*, "projection[s]" or other techniques. For example: "FIG. 5 is a flowchart 50 illustrating the reallocation of media. Controller 100 may initially project on-line inventory 110a of a total available inventory 110 for on-line fulfillment and project in-store inventory 110b for in-store fulfillment. ***Based on this projection or using some other technique, controller 100 allocates inventory 110 at step 502.*** Controller 100 tracks the actual in-store rental activity at step 504. Tracking the actual in-store rental activity may occur over a specific period of time. For example, controller 100 may track the actual in-store rental activity over a week, compare the projections and actual activity, and then continue tracking the actual in-store rental activity. Controller 100 tracks the actual in-store rental activity for any configurable period of time." *E.g.*, EX1010 (Evangelist), 9:17-29; *see also* EX1010 (Evangelist), 8:10-29 ("FIG. 4 is a flowchart 40 illustrating fulfilling a media request. ***Controller***

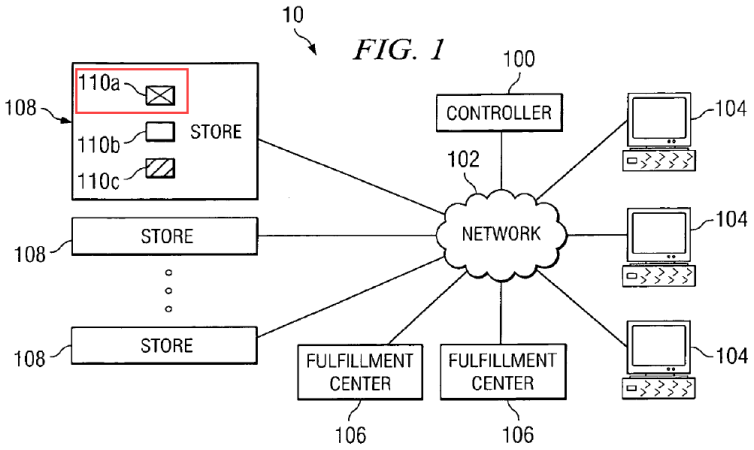
100 determines available inventory locations at step 400. Controller 100 considers fulfillment centers 106 and stores 108 based on geographical factors that may provide customer 104 the media in the shortest time. ***At step 402, controller 100 determines available inventory types in fulfillment centers 106 and stores 108. Controller 100 initially allocates inventory 110 to fulfillment centers 106 and stores 108 based on demographics, historical demands, or any suitable factor.*** Controller 100 further designates inventory 110 distributed to particular inventory locations. For example, controller 100 may determine that a particular store 108 receives fifty total copies of a media title, ten copies may be designated as on-line inventory 110a and forty copies may be designated as in-store inventory 110b. At step 404, controller 100 determines metrics of stores 108, such as the efficiency and accuracy of store 108. Controller 100 may consider other factors to select the inventory location in addition to the factors in steps 400-404. Furthermore, steps 400-404 may occur in parallel, sequentially, or in any suitable order."), Figs.4-5:

FIG. 5



252. Evangelist further discloses, *e.g.*, "***Stores 108 each represent an entity, such as a person, a group of persons, and/or appropriate hardware and controlling logic, capable of fulfilling requests or invoices for media. In some embodiments, stores 108 may include technology capable of exchanging information through network 102, for example, telephony equipment, computers, databases, a cable***

headend, satellite links, media players, or any other appropriate hardware and/or software. Furthermore, stores 108 may include traditional movie and game rental operations, such as viewable shelves of media inventory and point-of-sale equipment, which accommodate in-store media requests. ***Stores 108 include media inventory 110a-110c (generally referred to as inventory 110) that may be allocated based on the mode of fulfillment. For example, some of the media may be on-line inventory 110a designated for customers 104 who make on-line requests while other media may be in-store inventory 110b designated for customers 104 that make in-store requests.*** Also, visiting inventory 110c may represent media that belongs to another store 108 or fulfillment center 106." *E.g.*, EX1010 (Evangelist), 3:35-52; *see also* EX1010 (Evangelist), Fig.1:



253. Evangelist also discloses that its inventory is "initially designated" (*i.e.*, allocated). For example: "***When initially designated, available media count 302a***

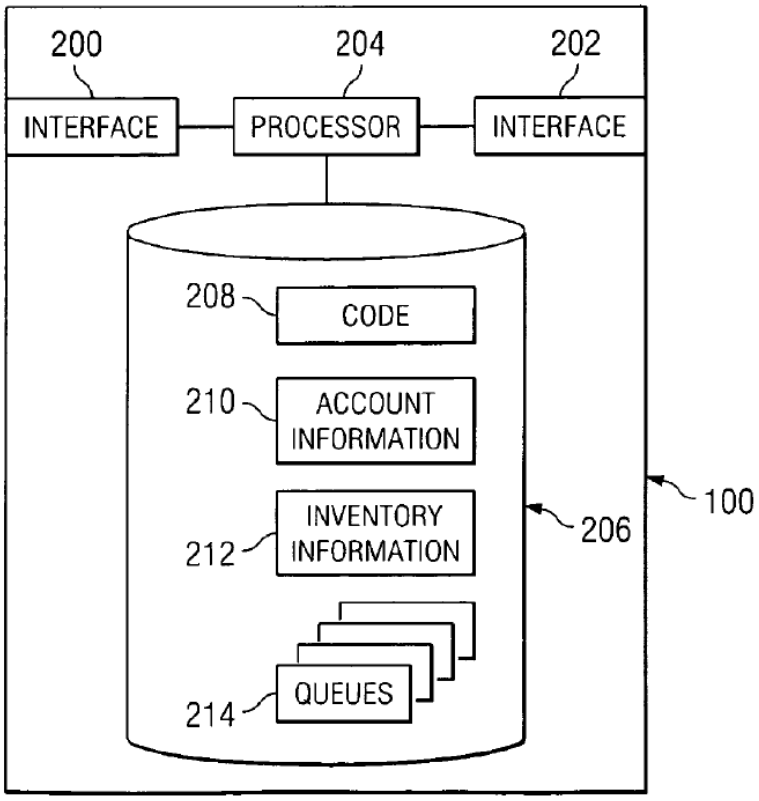
designated as on-line inventory 110a coincides with line 300, and available media count 306a designated as in-store inventory 110b coincides with line 304. Over time, customers 104 make media requests through on-line and in-store channels and the available media decreases. Available media count 302b represents the number of available on-line inventory 110a after a period of time, the available media decreases to zero at available media count 302c, and store 108 does not have any on-line inventory 110a of the media title. The media designated as in-store inventory 110b also decreases over time. Available media counts 306b-306e represent the decrease of in-store inventory 110b. For example, the maximum count of inventory 110 is available for a media title released on a Tuesday before customers 104 make requests. Available media count 302a represents the total available on-line inventory 110a and available media count 306a represents the total available in-store inventory 110b. As customers 104 begin making requests for the media title, the available media count decreases. By close of business on Thursday, on-line inventory 110a has decreased to available media count 302b and in-store inventory 110b has decreased to available media count 306b. By the end of Friday, on-line inventory 110a has an available media count 302c of zero and in-store inventory 110b decreases to available media count 306c. In-store inventory 110b continues to decrease on Saturday and Sunday, but an available media count 306e remains at the time an evaluation occurs." *E.g.*, EX1010 (Evangelist), 6:59-7:17.

254. And Evangelist expressly confirms that its distribution channels are "on-line": "Certain embodiments of the invention may provide one or more technical advantages. A technical advantage of one embodiment includes providing an efficient method of providing a customer with rented media. The system analyzes various criteria and selects an inventory location to fulfill a customer request. Inventory locations may include both fulfillment centers and stores, where the stores can ***allocate inventory for*** both ***on-line*** and in-store ***fulfillment***. Another technical advantage of an embodiment includes monitoring the activity of rentals and adjusting the inventory based on the rental activity. Adjusting the inventory to meet customer demand also promotes efficient operations and higher customer satisfaction." *E.g.*, EX1010 (Evangelist), 1:34-46; *see also* EX1010 (Evangelist), 2:30-32 ("For example, controller 100 may include a Web site that accepts requests for delivery of movies to customers 104.").

255. Evangelist further discloses that its inventory allocations are stored by its system. For example, Evangelist discloses "Inventory information 212 indicates the availability of media at fulfillment centers 106 and stores 108. For example, inventory information 212 includes the identity and geographic locations of inventory locations (fulfillment centers 106 and stores 108) in system 10. ***Inventory information 212 maintains a count of different types of inventories 110 for each media title at each inventory location.*** Inventory information 212 may also include

information regarding the store performance of stores 108, including a maximum number of on-line fulfillments allowed at store 108, accuracy and efficiency in meeting on-line requests, accounting information to credit revenue to store 108 for fulfilling on-line requests, and other similar information. Controller 100 updates inventory information 212 based on fulfilled requests, returned media, inventory updates and reconciliations, and other communications and activities in system 10. Thus, inventory information 212 may be based upon actual inventories. Alternatively or in addition, inventory information 212 may be based upon projections and forecasts of future inventories." *E.g.*, EX1010 (Evangelist), 5:20-38; *see also* EX1010 (Evangelist), Fig.2:

FIG. 2



256. Evangelist also discloses that its inventory is allocated via a computerized network: "***Network 102 allows controller 100 to communicate with other networks, customers 104, fulfillments centers 106, and/or stores 108. Network 102 may include a public switched telephone network (PSTN), a local area network (LAN), a wide area network (WAN), any other public or private data network, a local, regional, or global communication network such as the Internet***, an enterprise intranet, other suitable wireline or wireless communication link, or any combination of the preceding. Network 102 may include any combination of

gateways, routers, hubs, switches, access points, base stations, and any other hardware and/or software that may implement any suitable protocol or communication." *E.g.*, EX1010 (Evangelist), 2:49-60.

257. Further confirming that Evangelist performs initial allocations of its on-line inventory, Evangelist also expressly discloses ***reallocation*** of its on-line inventory based on sale data: "Customers 104 continue to request media for distribution through on-line and in-store channels over time. The activity continues after point A and the available media decreases as customers 104 continue to make requests. The actual in-store rental activity of media distribution is reevaluated at point B. For example, the reevaluation may occur a week after the initial evaluation, a month, or at any suitable time. Again, the evaluation may include comparing the amount of available media to the actual in-store rental activity, considering expected demand that is not as high based on historical trends that show demand decreases some time after release of a media title, or any suitable evaluation. At point B, in-store inventory 110b exceeds the demand for media through in-store requests, available media count 306h, while on-line inventory 110a does not meet the demand. ***In the illustrated embodiment, on-line inventory 110a and in-store inventory 110b is reallocated based on the comparison of projected activity and actual in-store rental activity.*** In-store inventory 110b decreases by Δ_2 and on-line inventory 110a increases by Δ_2. The reevaluation may continue additional times by comparing

actual in-store rental activity to the projected activity. Reallocation of on-line inventory 110a and in-store inventory 110b may occur based on the reevaluations." *E.g.*, EX1010 (Evangelist), 7:39-60; *see also* EX1010 (Evangelist), 7:18-38 ("At point A, controller 100 determines the actual in-store rental activity of the media title. For example, the actual in-store activity may be determined after the media is available for a week, after the media is available for five days, or for any suitable period of time. ***The actual in-store rental activity is evaluated to determine whether inventories 110a and 110b should be reallocated.*** The evaluation includes comparing the maximum amount of available media and the actual in-store rental activity, considering expected demand that is not as high based on historical trends that show demand decreases some time after release of a media title, or any suitable evaluation. In the illustrated embodiment, available media count 306e indicates available in-store inventory 110b when the evaluation occurs, while on-line inventory 110a is zero. Because there is in-store inventory 110b 'left-on-shelf,' ***controller 100 determines to allocate more media to on-line inventory 110a***. The total amount of available inventory 110 for distribution through both channels remains the same, but the particular allocation between in-store inventory 110b and on-line inventory 110a changes. ***After reallocation, on-line inventory 110a increases by $?_1$, while in-store inventory 110b decreases by $?_1$.***").

258. Jacob, Phillips, Tamura, Kono, and Evangelist describe inventory management systems that allocate inventory to distribution channels and that use sale data received from those channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0176], [0180]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"); EX1010 (Evangelist), 1:34-46 ("technical advantage… includes providing an efficient method of providing a customer with rented media" and "[a]djusting the inventory to meet customer demands also promotes efficient operations and higher customer satisfaction"), ("controller 100 initially allocates inventory to… stores 108 based on demographics, historical demands, or any suitable factor"); EX1029 (Phillips), 9, 30, 33, 120-121, 134-135, 141.

259. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed computer-implemented method of managing online bookings for transportation services inventory using Evangelist's beneficial teachings of initially allocating inventory to distribution channels.** Implementing Jacob's

disclosed computer-implemented method of managing online bookings of transportation services inventory (in the recited combinations)—including with initial input/"set up" information received from the vendor computing device of an owner/administrator/personnel of a Property/Properties (*e.g.*, EX1004 (Jacob), ¶[0086])—using Evangelist's beneficial teachings of, *e.g.*, initially allocating inventory to such channels, including by using, *e.g.*, projections, demographics or historical demands to select such channels, would have beneficially increased the likelihood that the proper quantities and most relevant types of inventory are initially allocated to each sales channel, thereby increasing the ability of the system to fulfill Jacob's express goal of "maximiz[ing]… revenue" by better accounting for marketplace dynamics. For POSITA (including from the express disclosures of Jacob, Evangelist, and Phillips, discussed above, and other similar systems known to POSITA) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1026 (Choi), 2 ("Since the hotel industry adopted revenue management in the 1980s, it has been developed and practiced by different hotel companies at varying levels of sophistication. Some hotels use daily occupancy forecasts to determine rate availability, while others develop multiple arrival forecasts for combination of rate, length of stay, and room type, and optimize the inventory allocation at every 15th booking."; "Allocation

decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions"), 3 ("Detailed forecasts by rate category and length of stay have been shown to reduce forecast error").

260. Thus, in my opinion, Jacob (in the recited combinations) in view of Evangelist renders obvious this limitation.

e. Element 1[d]

261. Claim 1[d] recites **"establishing, via the channel data structure, one or more active channel records based upon the one or more participant channels for the transportation service." In my opinion, Jacob (in the recited combinations) discloses or renders obvious this limitation. Alternatively, Jacob (in the recited combinations) in view of Tamura, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.**

262. In my opinion, **Jacob discloses establishing** (*e.g.*, designating)**, via the channel data structure** (*e.g.*, cl.1[b])**, one or more active channel records** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries showing "sales channel" is active (*e.g.*, via "sales channel data," "inventory data," "other data" reflecting, *e.g.*, channel is allocated inventory (*see* cl.1[c])/actively selling) **based upon the one or more participant channels for the transportation service** (*see* cl.1[c])**.**

263. For example, Jacob discloses: "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. ***The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" *E.g.*, EX1004 (Jacob), ¶[0006].

264. Jacob further discloses that "[a]s used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which manage data do so through their associated functions." *E.g.*, EX1004 (Jacob), ¶[0078].

265. In addition, Jacob discloses: "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised***

of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data. Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels**.** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless

network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082]; *see also* EX1004 (Jacob), ¶[0083] ("***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk.")

266. Jacob additionally discloses, *e.g.*, that its system stores in its "database" active channel records such as "sales channel data," "inventory data" and "other data": "***Embodiments of the invention comprise a computerized database such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational***

or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, ***inventory data***, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, ***sales channel data***, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." *E.g.*, EX1004 (Jacob), ¶[0084].

267. Jacob expressly discloses or at minimum renders obvious storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*, EX1004 (Jacob), ¶[0084]) via a channel data structure (*see* cl.1[b]). As discussed, Jacob (in the recited combinations) also expressly discloses allocating inventory to each sales channel (*see* cl.1[c]) and closing Rate Types/Room Types for certain channels (*e.g.*, EX1004 (Jacob), ¶[0180]).

268. In my opinion, based on these disclosures, **POSITA would have further understood the system of Jacob (in the recited combinations) differentiates between channels that are allocated inventory and are selling (*i.e.*,**

participant channels) and those that are not, and does so by designating, via data stored in the channel data structure (*i.e.*, record for a channel comprising, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data") a record of such participant channels (*e.g.*, record contains data indicating channel is active—allocated inventory/selling). At minimum, **POSITA would have understood that Jacob necessarily, and thus inherently does so in order to allow Jacob's system to differentiate between channels that are selling (and thus, *e.g.*, should be considered for purposes of determining whether another channel is, *e.g.*, "selling better") and those that are not**.

269. To the extent it is argued further disclosure is required, in my opinion, **POSITA at minimum would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed channel data structure and storage of "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data" using Jacob's beneficial teachings of allocating inventory to/selecting particular sales channels such that Jacob's system (in the recited combinations) establishes via the channel data structure one or more active channel records based upon the one or more participant channels for the transportation service.** This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that

are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should additional sales channels become necessary (*e.g.*, if participant channels are not selling well). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels." EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

270. Thus, in my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.

271. To the extent it is argued further disclosure of establishing one or more active channel records based upon one or more participant channels, **this would have been obvious based on Jacob (in the recited combinations) in view of Tamura.**

272. **Tamura discloses establishing** (*e.g.*, designating)**, via the channel data structure** (*e.g.*, cl.1[b])**, one or more active channel records** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries showing "retailer" is selling) **based upon one or more participant channels** (*e.g.*, particular "retailer" (*e.g.*, "Retailer A" (Fig.3), "Retailer B" (Fig.3)) by which "item of merchandise" is "sold") (*see* Fig.3))**.**

273. For example, Tamura discloses that its "merchandise distribution management server" receives from Tamura's participant channels, among other things, sales and inventory data, and that such information is stored in, *e.g.*, Tamura's "merchandise distribution management server": "Fig. 1 is a block diagram of the overall configuration of a sales management system illustrating a first embodiment of the invention. ***In the figure, the sales management system 20 is connected to a merchandise distribution management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period. For example, the server receives sales information from POS terminals at the retail stores***, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise

distribution management server 10 is also transmitted to the manufacturers' production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer's side, sales department personnel use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as to evaluate the selling capabilities of each retailer." *E.g.*, EX1005 (Tamura), ¶[0017]; *see also* EX1005 (Tamura), ¶[0026] ("Next, the time-of-sale purchase-price calculation unit 28 calculates the sold purchase price, based on the reference retail price, at the stage when the item purchased based on the allocation quantity is sold at each retail store (S108). Each time the item is sold, at each retail store, ***sales information is transmitted from the POS terminal to the sales management system 20 and the merchandise distribution management server 10***."), Figs.2-3:

Fig. 2

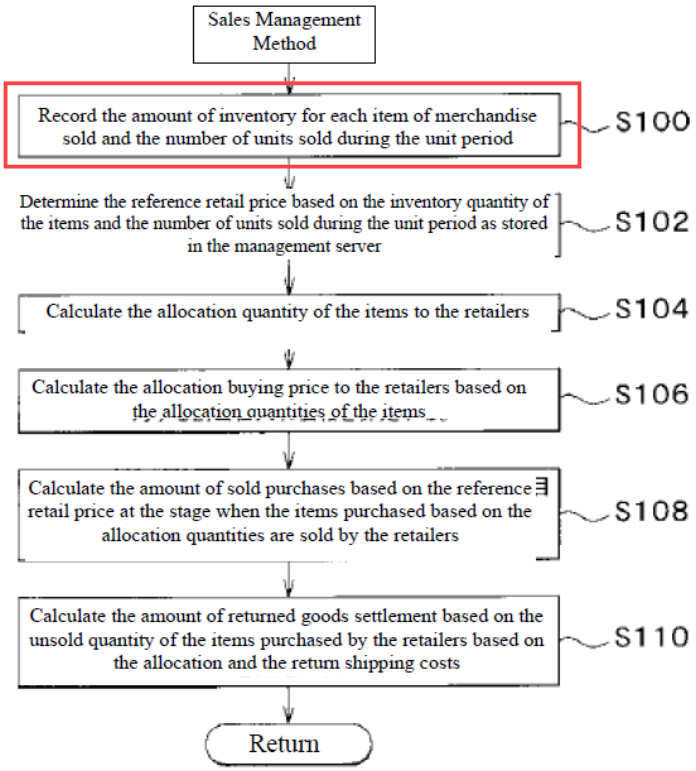
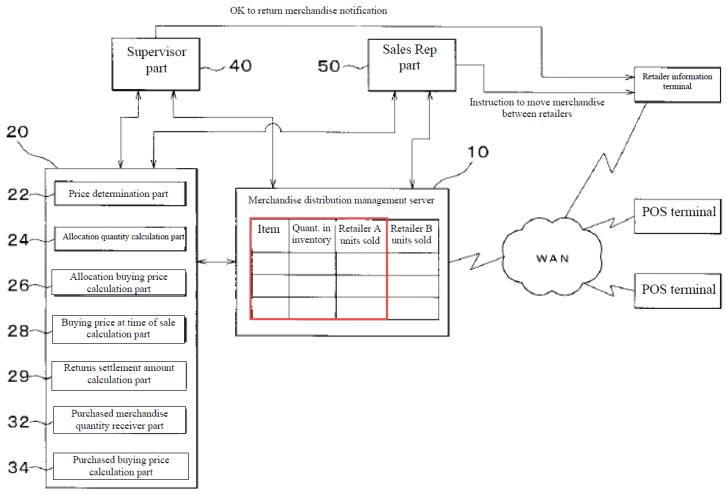


Fig. 3



274. Tamura further discloses that information stored by its "merchandise distribution management server" includes, *e.g.*, "the amount of inventory for each

item of merchandise sold and the number of units sold during the unit period": "The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100)***; a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." *E.g.*, EX1005 (Tamura), ¶[0014]; *see also* EX1005 (Tamura), ¶¶[0024] ("Following is a description of the flow of merchandising transactions in the sales management system thus configured. Fig. 2 is a flowchart describing the sales management method. ***First, the inventory quantity for each item of the sold merchandise and the number of units sold during the unit period are stored in the merchandise distribution management server 10***

(S100), as well as the retailer identification information of the sold merchandise. Additionally, the merchandise distribution management server 10 also stores information related to each item of sold merchandise, such as the item number, allocated buying price, reference retail price, sold purchase amount, and returned goods settlement amount. Such information related to each item of merchandise sold may be identified and managed, for example, by means of tags attached to the merchandise sold."), cl.5 ("A sales management method for executing each step using a computer: ***recording the inventory and the number of units sold during the unit period for each item of merchandise for sale***; determining the reference retail price based on the inventory and the number of units sold during the unit period of the item as stored in the management server; calculating the allocated quantity of the items for each retailer; calculating the allocated stocking price of the items for each retailer based on the allocated quantity of the items; calculating stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and calculating the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity.").

275. As discussed, both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004

(Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. And, as discussed, Jacob expressly discloses storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*, EX1004 (Jacob), ¶[0084]) via a channel data structure (*see* cl.1[b]). Tamura discloses storing a channel record (*see* cl.1[b]) establishing that a particular "retailer" (*e.g.*, "Retailer A"; "Retailer B") is selling ("item of merchandise" is "sold"). *E.g.*, EX1005 (Tamura), ¶¶[0017], [0024], Fig.3.

276. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management and distribution system (in the recited combinations), including its disclosures of storing "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data" using Tamura's beneficial teachings of establishing one or more active channel records based upon one or more participant channels.** This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as

well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should additional sales channels become necessary (*e.g.*, if participant channels are not selling well). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels," (*e.g.*, EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Tamura's express goals of "reducing lost sales opportunities" and "eliminating a great deal of waste in the distribution process." *E.g.*, EX1005 (Tamura), ¶¶[0001], [0015]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029 (Phillips), 31 (discussing, *e.g.*, "a 'pricing matrix' database [that] specifies which prices are available to which customers through which channels").

277. Thus, in my opinion, Jacob (in the recited combinations) in view of Tamura discloses or at minimum renders obvious this limitation.

278. Alternatively, to the extent it is argued further disclosure of establishing one or more active channel records based upon one or more participant channels,

this would have been obvious based on Jacob (in the recited combinations) in view of Kono.

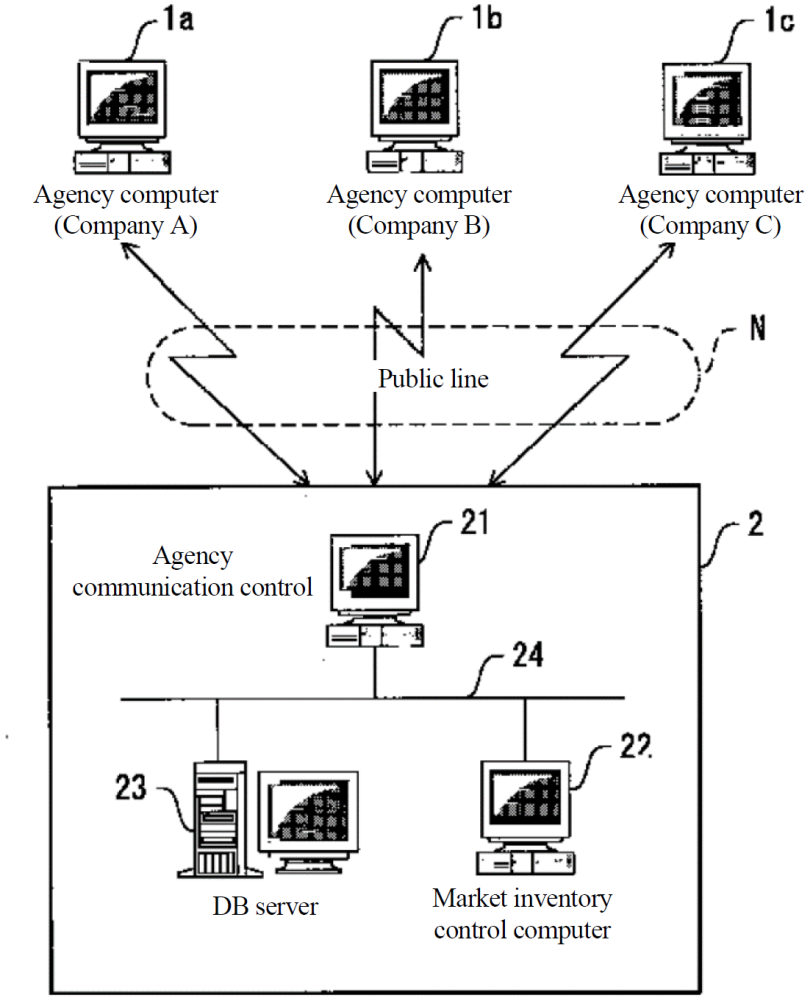
279. **Kono discloses establishing** (*e.g.*, designating)**, via the channel data structure** (*e.g.*, cl.1[b])**, one or more active channel records** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries (*e.g.*, "contents of…form") showing "agency" is selling) **based upon one or more participant channels** (*e.g.*, agency (*e.g.*, "aaaa," (Fig.4) "bbbb," "Company A," (Fig.1) "Company B," (Fig.1) "Company C" (Fig.1)) at which "order" or "orders" are placed; agency with more than "0" "Inventory Count," "Order Backlog" and "Shipping Volume") (*see* Fig.4)**.**

280. For example, Kono discloses that its system "acquires product shipment information from an agency to a retail store and product inventory information of the agency from each agency": "A maker-side server device, the maker being a manufacturer, ***acquires product shipment information from an agency to a retail store and product inventory information of the agency from each agency*** (steps S1, S2), calculates a predicted sales volume for the next month based on the acquired product shipment information and product inventory information of each agency (step S3), and determines whether to produce or stop production on the basis of the calculated predicted sales volume for the next month (steps S4, S5) and the like. When, as a result, production is stopped, for the product whose sales on the market have fallen, inventory adjustment is performed on the market by instructing resale

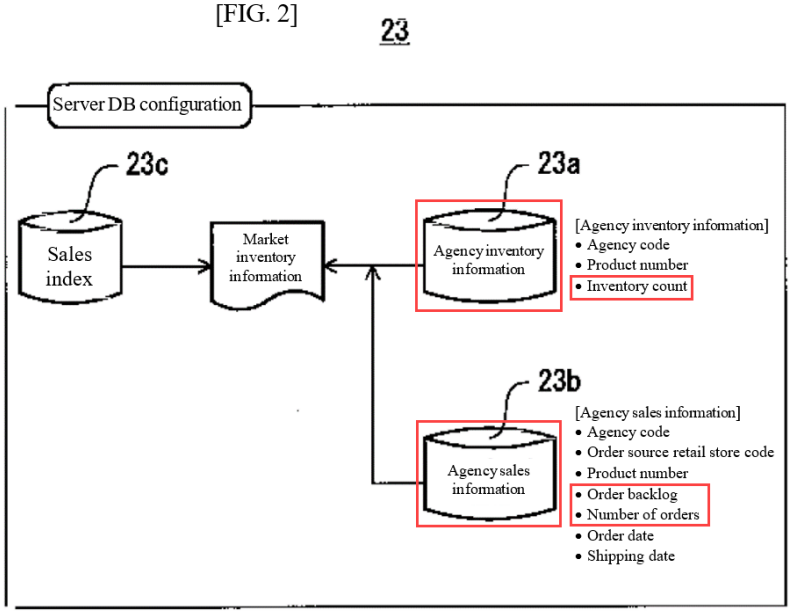
of the inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instructing transfer between warehouses (step S7)." *E.g.*, EX1007 (Kono), Summary.

281. Kono further discloses that such information (among other information) is stored in "databases controlled by the database server 23": "FIG. 2 illustrates an example of various databases controlled by the database server 23. Three kinds of databases controlled by the database server 23 are prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the agency sales information database 23b. Moreover, ***monthly sales indexes of the previous year and current year are saved in the sales index database 23c***. In the database server 23, these data are updated daily so that ***the data can be stored and analyzed***. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software." *E.g.*, EX1007 (Kono), ¶[0026]; *see also* EX1007 (Kono), Figs.1-2:

[FIG. 1]


1a
1b
1c
Agency computer (Company A)
Agency computer (Company B)
Agency computer (Company C)
N
Public line
2
21
Agency communication control
24
23
22
DB server
Market inventory control computer

[FIG. 2]



282. Kono further discloses that agency sales and inventory information, is stored in a "form," such as shown in Figure 4: "***The maker-side server device 2 checks the sales of each agency by referring to the contents of this form***. In the example illustrated in FIG. 4, at the agency "ffff" the shipping volume for the last month is 250, and the backlog of orders is 250, while the remaining inventory is more than enough at 2,500. Since the production of product "AAAAAAA" has been stopped and a new substitute product is already scheduled to be introduced to the market, the product "AAAAAAA" will not be sold in the future. In this case, conventionally, products that are no longer necessary at the agency will be returned from the commercial practice of daily necessities, and the maker must pay the agency for the price of the return. On the other hand, at the agency "bbbb," the inventory count is 336, and the backlog of orders remaining is 2,390, and movement

of products is still active, and products are presently still out of stock." *E.g.*, EX1007 (Kono), ¶[0043]; *see also* EX1007 (Kono), Fig.4:

[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

283. As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). And, as discussed, Jacob expressly discloses storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*, EX1004 (Jacob), ¶[0084]) via a channel data structure (*see* cl.1[b]). Kono discloses designating entry/entries (*e.g.*, "contents of… form") showing that a particular "agency" is selling (*e.g.*, agency "aaaa" or "Company A" at which "order" or "orders" are "placed"). *E.g.*, EX1007 (Kono), ¶[0043], Fig.4.

284. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management and distribution system (in the recited combinations), including its disclosures of storing "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data" using Kono's beneficial teachings of establishing one or more active channel records based upon one or more participant channels.** This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should additional sales channels become necessary (*e.g.*, if participant channels are not selling well). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels," (*e.g.*, EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory

control of each agency" (*e.g.*, EX1007 (Kono), Summary) and reducing "unnecessary inventory on the market," EX1007 (Kono), ¶¶[0011], [0015], [0017]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029 (Phillips), 31 (discussing, *e.g.*, "a 'pricing matrix' database [that] specifies which prices are available to which customers through which channels").

285. Thus, in my opinion, Jacob (in the recited combinations) in view of Kono discloses or at minimum renders obvious this limitation.

f. Element 1[e]

286. Claim 1[e] recites **"establishing, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service." In my opinion, Jacob (in the recited combinations) discloses this limitation. Alternatively, in my opinion, Jacob (in the recited combinations) in view of Phillips renders obvious this limitation.**

287. In my opinion, **Jacob discloses establishing** (*see* cl.1[d])**, via the channel data structure** (*see* cl.1[b])**, one or more inactive channel records based upon one or more non-participant channels for the transportation service** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries showing "sales channel" is inactive (*e.g.*, via "sales channel data," "inventory data," "other data" reflecting, *e.g.*, channel

is not allocated inventory (*see* cl.1[c])/not actively selling), "Rate Type/Room Type" "close[d]" "for certain channels")) (*see* cl.1[c], [d])**.**

288. For example, Jacob discloses that a "Property does its bookings through various channels": "***A Property does its bookings through various channels, and it associates inventory with various Rate Types*** in order to maximize occupancy rate and maximize room rate for each Room Type." *E.g.*, EX1004 (Jacob), ¶[0154].

289. Jacob discloses that its "plurality of selling channels" includes, *e.g.*, "global distribution systems," a "hotel web site," and "consolidator websites": "The system may be configured to communicate with the hotel staff, the hotel property management database, and a ***plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™,*** *telephone reservation systems,* ***a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems,*** *and tour operators*. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." *E.g.*, EX1004 (Jacob), ¶[0007]; *see also* EX1004 (Jacob), ¶¶[0063] ("As used herein a GDS, or Global Distribution System, is a term used for major travel reservation

systems (such as Apollo™, Sabre™, Worldspan™) which have a worldwide presence and were originally designed to provide reservations for the airline industry. Approximately 500,000 travel agents have access to these systems, which have been extended to allow bookings for the hotel/travel industry. [] As used herein End User, or EU refers to the users who come to a Property website, search for rooms, and optionally make a reservation. An EU may be a hotel customer or a travel agent using a GDS, a tour operator, a telephone reservation center worker, or other person using the system to make a reservation."), [0077] ("As used herein a Sales Channel or Selling Channel refers to a wholesale or retail selling channel. Sales channels may comprise GDS system, telephone reservations systems, tour operators, ***hotel web sites***, ***consolidator web sites such as Expedia™ or Travelocity™***.").

290. Jacob further discloses that its RezTrip system communicates with "the hotel user," and Jacob's sales channels and that such communications include "Rates and Availability" information and reservation information: "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is

not intended to limit the invention to the specific embodiment described." *E.g.*, EX1004 (Jacob), ¶[0085]; *see also* EX1004 (Jacob), Fig.7:

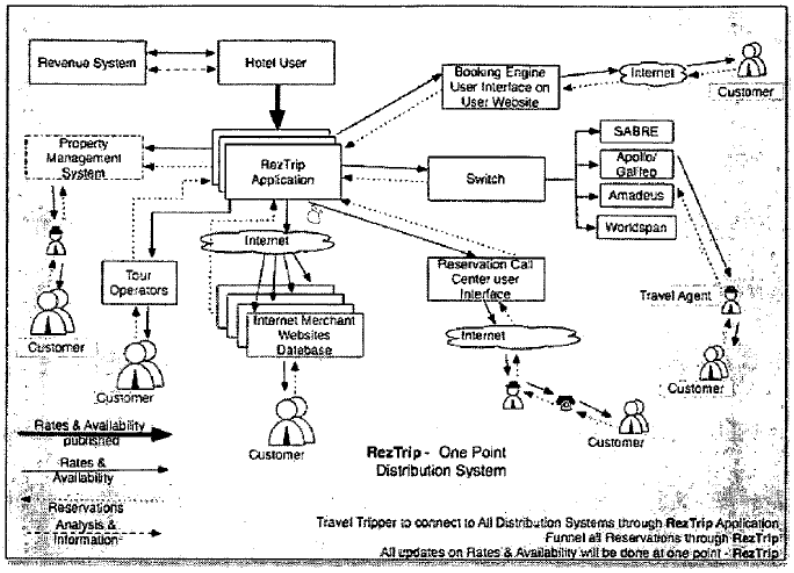


Figure 7

291. Jacob further discloses that its system may "close the Rate Type/Room Type… for certain channels," which POSITA would have understood means that inventory is removed from such channels and those channels thus become "non-participant channels": "If a sales channel's Room Type inventory is sold out or is selling better than other channels, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, ***the PA may choose to close the Rate Type/Room Type, for a given date or a series of dates, for certain channels***." *E.g.*, EX1004 (Jacob), ¶[0180].

292. Jacob further discloses that its system stores in a "computerized database," "hotel data" that includes, among other things, "inventory data," "sales channel data," and "other data," which POSITA would have understood included records showing which channels have been allocated inventory (and are thus participant channels), and which channels are not allocated inventory (and are thus non-participant channels): "***Embodiments of the invention comprise a computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. ***The database is configured to manage hotel data comprising*** portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, ***inventory data***, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, ***sales channel data***, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." *E.g.*, EX1004 (Jacob), ¶[0084].

293. As discussed, Jacob expressly discloses or at minimum renders obvious storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*,

EX1004 (Jacob), ¶[0084]) via a channel data structure (*see* cl.1[b], 1[d]). As discussed, Jacob (in the recited combinations) also expressly discloses or at minimum renders obvious allocating inventory to each sales channel (*see* cl.1[c]) and closing Rate Types/Room Types for certain channels (*e.g.*, EX1004 (Jacob), ¶[0180]). Jacob further discloses not selecting (or de-selecting) certain channels—*e.g.*, that "[a] Property does its bookings through ***various*** channels, and it associates inventory with various Rate Types in order to maximize occupancy rate and maximize room rate for each Room Type," but ***"for certain channels" a "Rate Type/Room Type" may be "close[d]"*** (*e.g.*, EX1004 (Jacob), ¶¶[0154], [0180]).

294. In my opinion, based on these disclosures, **POSITA would have further understood the system of Jacob (in the recited combinations) differentiates between channels that are not allocated inventory and are *not* selling (*i.e.*, non-participant channels) and those that *are*, and does so by designating, via data stored in the channel data structure (*i.e.*, record for a channel comprising, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data") a record of such non-participant channels (*e.g.*, record contains data indicating channel is inactive—not allocated inventory/not selling).**

295. At minimum, in my opinion, POSITA would have understood that **Jacob necessarily, and thus inherently does so in order to allow Jacob's system**

to differentiate between channels that are selling (and thus, *e.g.*, should be considered for purposes of determining whether another channel is, *e.g.*, "selling better") and those that are not.

296. Thus, in my opinion, Jacob (in the recited combinations) discloses this limitation.

297. To the extent it is argued further disclosure is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Phillips.**

298. **Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive** (*e.g.*, "Some products may not be offered through some channels"; "Southwest Airlines and JetBlue… do not accept bookings through any… GDS" other than "SABRE")**.**

299. For example, Phillips discloses that "**The goal of pricing and revenue optimization is to provide the right price,**

- for every product
- to every customer segment
- **through every channel**

and to update those prices over time in response to changing market conditions. The three dimensions of pricing and revenue optimization can be illustrated in a cube, as shown in Figure 2.4. Each element within the cube represents a combination of product, channel, and customer segment. Each element (or *cell*) has an associated price. For example, one element might be: *medium-size turbines sold to large*

customers in the northeast via the direct sales channel[.] Another element might be: *Replacement gears sold to small companies via online sales*[.] In theory, each cell within the PRO cube could correspond to a different price. In practice, some cells may not be meaningful. **Some products may not be offered through some channels,** for example." *E.g.*, EX1029 (Phillips), 26 (italics in this quote original).

300. Phillips also expressly discloses establishing that certain vendors do not use particular sales channels, which POSITA would have understood as a disclosure that other, non-used channels, are "non-participant" channels. For example: "Global distribution systems provide a conduit connecting the reservation system and a number of important sales outlets-particularly travel agents. There are currently over 180,000 GDS terminals worldwide. Most of these terminals are placed with travel agents, but some are in the travel offices oflarge companies (Marvel 2004). The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan…. Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines. Most airlines, major hotel chains, major rental car companies, and cruise lines have contracts with most or all of the global distribution systems allowing them to distribute and sell their products. There are exceptions: ***Both Southwest Airlines and JetBlue Airways subscribe only to SABRE and do***

not accept bookings through any other GDS (Kontzer 2004)." *E.g.*, EX1029 (Phillips), 126.

301. Phillips further discloses that "In fact, ***it is not uncommon for individual sellers to be utilizing different approaches for different products through different channels***. For example, an automobile manufacturer is likely to sell the majority of vehicles through dealers, utilizing a combination of "shelf price" (in this case, the wholesale price) and promotions. However, Ford Motor Company receives about 9% of its revenue in North America from group sales of cars to corporate, government, and industrial fleets. These sales are generally priced through individual negotiations or bids. Finally, ***a manufacturer may also be selling some cars directly to the public through a deal with an online channel***. In this case, the manufacturer needs to apply pricing and revenue optimization across the entire range of its channels and pricing mechanisms in order to maximize total profitability." *E.g.*, EX1029 (Phillips), 29.

302. In addition, Phillips discloses that vendors "determine whether or not to provide availability" through each channel: "The range of costs shown in Figure 6.4 represents a channel-pricing opportunity. It also provides an expanded opportunity for revenue management—***airlines and hotels can establish fare classes based on the channel of a booking request and determine whether or not to provide availability through that channel.*** Furthermore, it provides a tremendous

economic incentive for revenue management companies to steer demand as much as possible through lower-cost channels. While online travel has been booming, the global distribution systems still account for about 60% of bookings for a typical airline and about 68% for a typical hotel, leaving plenty of scope for future savings (Grossman 2004)." *E.g.*, EX1029 (Phillips), 137-38; *see also* EX1029 (Phillips), 79 ("Special ***"Web-only" fares for airline tickets are available through the Internet but not through travel agencies***."), 31 ("For an airline or hotel, prices are updated by opening or closing fare classes—a process discussed in more detail in Chapter 6. In other cases, ***a "pricing matrix" database specifies which prices are available to which customers through which channels***.").

303. As discussed, both Jacob and Phillips describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1029 (Phillips), 9, 30, 33, 121-122, 134-135, 141. In addition to Jacob's teachings, Phillips expressly discloses the existence of non-participant channels that are known to be inactive, teaching that, *e.g.*, **"*[s]ome products may not be offered through some channels*,"** and, *e.g.*, "***Southwest Airlines and JetBlue***… subscribe ***only*** to ***SABRE*** and ***do not accept bookings through any other GDS***." *E.g.*, EX1029 (Phillips), 26, 126, 29 ("a manufacturer may also be ***selling***

some ***cars*** directly to the public ***through a deal with an online channel***"), *see also* EX029 (Phillips), 31 ("a 'pricing matrix' database specifies ***which prices are available to which customers through which channels***"), 79 ("Special "Web-only" ***fares*** for airline tickets are ***available through the Internet but not through travel agencies***."), 137-38 ("airlines and hotels can establish fare classes based on the channel of a booking request and determine ***whether or not to provide availability through that channel***."; noting there is "***tremendous economic incentive for revenue management companies to steer demand as much as possible through lower-cost channels***.").

304. At minimum, in my opinion, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's system (in the recited combinations), including its disclosures of storage of "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data," using Jacob's and Phillips's beneficial teachings of not selecting/de-selecting certain channels (discussed *supra*) to participate/from participating in selling Jacob's transportation services inventory such that the system (in the recited combinations) establishes, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service,** including by establishing a record of non-participant channels with data reflecting that they are inactive. This would have, *e.g.*,

beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should a price adjustment or additional sales channels become necessary (*e.g.*, if existing participant channels are not selling well or if they have a lower expected net contribution to revenue). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" (*e.g.*, EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Phillips's express goal of, *e.g.*, "maximizing *expected net contribution*," which is "price (fare) minus incremental cost," consistent with Phillips's teaching that there is "tremendous economic incentive… to steer demand as much as possible through lower-cost channels." EX1029 (Phillips), 136-38 (emphasis original). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

305. Thus, in my opinion, Jacob (in the recited combinations) in view of Phillips renders obvious this limitation.

g. Element 1[f]

306. Claim 1[f] recites "**linking the one or more active channel records to the channel interface.**" **In my opinion, Jacob (in the recited combinations) discloses or renders obvious this limitation. Alternatively, in my opinion, Jacob (in the recited combinations) in view Kono renders obvious this limitation.**

307. In my opinion, **Jacob discloses linking the one or more active channel records** (*e.g.*, cl.1[d]) **to the channel interface** (*see* cl.1[a]) (*e.g.*, making the records available via the interface (including, *e.g.*, using "code segments configured to interact with the [system's] database" that allow the RezTrip computer/server to access the "system database" storing the records), such that, "[o]nce the PA has set up the Property within the system, EUs may connect to the reservation engine [RezTrip],… select a room, and make a reservation.") (*see* cl.1[a])**.**

308. For example, Jacob discloses "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code***

segment configured to manage hotel data, and other time-dependent inventory data. Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. ***Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of***

the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082].

309. Jacob further discloses "Embodiments of the invention comprise a ***computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The ***database is configured to manage hotel data*** comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, ***embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PAs), and to communicate with other systems, such as sales systems (sales channels) of vendors***. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." *E.g.*, EX1004 (Jacob), ¶[0084].

310. In addition, Jacob discloses, *e.g.*, "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The ***data relating to the Property are stored in the system database***. The EA or SU then associates a PA with the property. The PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies, and later by managing inventory and room rates. ***Once the PA has set up the Property within the system, EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation***. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property." *E.g.*, EX1004 (Jacob), ¶[0086].

311. Jacob further discloses, for example, "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. As shown in FIG. 7, ***the RezTrip™ system communicates with the hotel user***, the hotel property management system, tour operators, ***internet web merchants***, reservation call centers, GDS systems, and the hotel's own website. It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described." EX1004 (Jacob), ¶[0085]; *see also* EX1004 (Jacob), Fig.7:

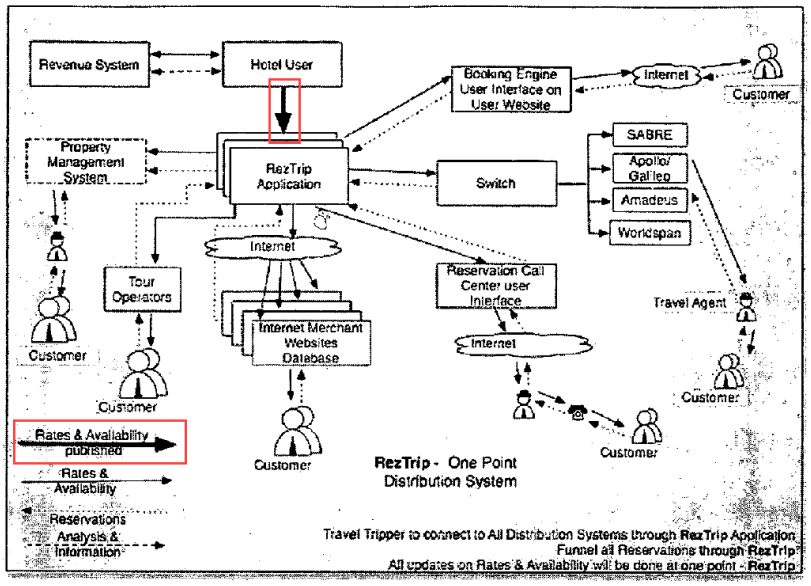


Figure 7

312. As shown in cls.1[a]-[c], Jacob (in the recited combinations) discloses or at minimum renders obvious a channel interface, through which, *e.g.*, Property personnel may, *inter alia*, "set up" and later modify the allocation, price, and other attributes of Jacob's time-dependent inventory—and that, after being, *e.g.*, received from the "PA" (Property Administrator), the "data relating to the Property are stored in the system database"—including in channel records for each channel, *see* cl.1[b]. Jacob additionally explains that, "[o]nce the PA has set up the Property within the system, [end users] may connect to the reservation engine [RezTrip], [including] through intermediaries, select a room, and make a reservation." *E.g.*, EX1004 (Jacob), ¶¶[0086], [0066], [0113]-[0115] [0176], [0180], Figs.20-47. Jacob further discloses that its software includes "code segments configured to interact with the

database," which, *inter alia*, stores "sales channel data," "inventory data," and "other data" (*e.g.*, EX1004 (Jacob), ¶¶[0082]-[0084]), as well as a "code segment configured to communicate pricing information and inventory information to a plurality of sales channels" (*e.g.*, EX1004 (Jacob, cl.5), serving the goal that "each sales channel would always be working with the most up-to-date pricing, availability, and other information." *E.g.*, EX1004 (Jacob), ¶[0005].

313. In my opinion, **POSITA would have understood from these disclosures that Jacob expressly discloses making available the one or more stored active channel records (*see* cl.1[b]) to the channel interface to permit Property personnel using the vendor computing device to exchange data with the RezTrip computer/server (and the database it accesses, facilitated by "code segments configured to interact with the [system's] database") through the channel interface, to perform both initial setup of, and later modification to, such records, which are used by the RezTrip computer/server in its interactions with the channels.** In my opinion, at minimum, **POSITA would have understood that Jacob (in the recited combinations) necessarily, and thus inherently, discloses that these records are made available via the channel interface in order to enable Jacob's above-discussed setup and modification of, and access to, the active channel records.**

314. Alternatively, to the extent it is argued further disclosure is required, at minimum, in my opinion, **POSITA would have found it obvious, straightforward, and advantageous to implement the combined system's disclosed database and code segments, and initial setup/later modification to attributes of Jacob's time-dependent inventory (in the recited combinations) such that the system's one or more active channel records are made available to the channel interface.** This would have, *e.g.*, beneficially allowed the system and its users to use and modify the active channel records using Jacob's (or the combined system's) disclosed computer hardware and software to, *e.g.*, set and update pricing information and/or inventory allocations in response to changing market conditions, and enabled the use (and communication to, *e.g.*, the channels) of the data these records contain. This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels." *E.g.*, EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *E.g.*, EX1029 (Phillips), 31 (discussing, *e.g.*, "a 'pricing matrix' database [that] specifies which prices are available to which

customers through which channels"), 134 ("revenue management system includes a database with information on current bookings on all flights. It also includes a database incorporating fares for all product/fare class combinations, capacities on all flight legs, and passenger variable costs by product.").

315. Thus, in my opinion, Jacob discloses or at minimum renders obvious this limitation.

316. To the extent it is argued further disclosure is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Kono.**

317. **Kono discloses linking the one or more active channel records** (*e.g.*, cl.1[d]) **to the channel interface** (*see* cl.1[a]) (*e.g.*, making the records available via the interface) (*see* cl.1[a])**.**

318. For example, Kono discloses storing, *e.g.*, product shipment and inventory information of each agency: "Moreover, ***the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like.*** Moreover, the market inventory control computer 22 is provided with: ***acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency*** from each agency terminal 1a, 1b, 1c, ...; analysis means for estimating sales volume of

the product on the overall market and performs a sales analysis at each agency; and transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, ***instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instructing transfer between warehouses." *E.g.*, EX1007 (Kono), ¶[0025]; *see also* EX1007 (Kono), ¶[0024] ("This system is configured such that agency terminals 1a, 1b, 1c, ... installed at each agency having transactions and a server device 2 of the manufacturer (maker side) are connected via a network (public line) N. However, the agency terminals 1a, 1b, 1c, ... and the manufacturer server device (hereinafter referred to as the maker-side server device) 2 may be connected by a communication network such as the Internet.").

319. Kono further discloses making available the records via Kono's channel interface. For example, Kono discloses "***The maker-side server device 2 checks the sales of each agency by referring to the contents of this form***. In the example illustrated in FIG. 4, at the agency "ffff" the shipping volume for the last month is 250, and the backlog of orders is 250, while the remaining inventory is more than enough at 2,500. Since the production of product "AAAAAAA" has been stopped and a new substitute product is already scheduled to be introduced to the market, the product "AAAAAAA" will not be sold in the future. In this case, conventionally, products that are no longer necessary at the agency will be returned

from the commercial practice of daily necessities, and the maker must pay the agency for the price of the return. On the other hand, at the agency "bbbb," the inventory count is 336, and the backlog of orders remaining is 2,390, and movement of products is still active, and products are presently still out of stock." *E.g.*, EX1007 (Kono), ¶[0043]; *see also* EX1007 (Kono), Fig.4:

[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

320. As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). And, as discussed, Jacob expressly discloses a channel interface , through which, *e.g.*, Property personnel may, *inter alia*, "set up" and modify the allocation, price, and other attributes of Jacob's time-dependent inventory—and that, after

being, *e.g.*, received from the Property Administrator, the "data relating to the Property are stored in the system database"—including in channel records for each channel, *see* cl.1[b]. Jacob explains: "Once the PA has set up the Property within the system, [end users] may connect to the reservation engine [RezTrip], [including] through intermediaries, select a room, and make a reservation." *E.g.*, EX1004 (Jacob), ¶¶[0086], [0066], [0113]-[0115] [0176], [0180], Figs.20-47. And Jacob discloses that its software includes "code segments configured to interact with the database," which, *inter alia*, stores the pertinent data (*e.g.*, EX1004 (Jacob), ¶¶[0082]-[0084]), as well as a "code segment configured to communicate pricing information and inventory information to a plurality of sales channels." *E.g.*, EX1004 (Jacob), cl.5, ¶[0005]. Kono further discloses storing and updating, using received sale data, the "contents of" Kono's "form," which include "Agency Name," "Inventory Count," "Order Backlog," and "Shipping Volume." *E.g.*, EX1007 (Kono), ¶[0043], Fig.4. Kono further discloses that this agency inventory information such as "Inventory Count," "Number of orders," and "Order Backlog" are stored on and "controlled by the database server 23" and that "these data can be analyzed by general purpose spreadsheet software." *E.g.*, EX1007 (Kono), ¶[0026], Brief Description of Drawings, Fig.2. POSITA would have understood from these disclosures that Kono expressly discloses making available the "contents of" this form (including, *e.g.*, channel-specific inventory and shipping information) to the

channel interface so that information in the form can be kept up to date with inventory and shipping information (received from, *e.g.*, the "Agency communication control computer" by the DB server) and can be used to determine whether inventory should be reallocated between Kono's agencies.

321. In my opinion, **POSITA at minimum would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Kono's beneficial teaching of linking the one or more active channel records to the channel interface.** This would have, *e.g.*, beneficially allowed the system and its users to use and modify the active channel records using Jacob's (or the combined system's) disclosed computer hardware and software to, *e.g.*, set and update pricing information and/or inventory allocations in response to changing market conditions, and enabled the use (and communication to, *e.g.*, the channels) of the data these records contain. This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels," (*e.g.*, EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."), and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" (Kono Summary) and reducing "unnecessary inventory on

the market," *e.g.*, EX1007 (Kono), ¶¶[0011], [0015], [0017]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

322. Thus, in my opinion, Jacob (in the recited combinations) in view of Kono renders obvious this limitation.

h. Element 1[g]

323. Claim 1[g] recites "**receiving, in real time**[15] **for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, sale data corresponding to at least one or more**

[15] I understand that "receiving, in real time" indicates receiving the most recent data "pushed" (sent by the "push" method) from the channels. *See* §VI.C. As discussed below, Jacob (in the recited combinations) discloses or Jacob-Phillips/Jacob-Phillips-Franklin (in the recited combinations) at minimum renders this obvious. As discussed below, to the extent "in real time" is construed to require that the input and processing of data occur concurrently with an external activity and in time to affect that activity, Jacob (in the recited combinations) also discloses or at minimum renders obvious receiving "in real time" under this interpretation.

additional vendor computing devices." **In my opinion, Jacob (in the recited combinations) discloses or at a minimum renders obvious this limitation. Alternatively, in my opinion, Jacob (in the recited combinations) in view of Franklin, Jacob (in the recited combinations) in view of Tamura, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.**

324. In my opinion, **Jacob discloses receiving** (*e.g.*, "receiv[ing]")**, in real time** (*e.g.*, "communication code segment" receives, *e.g.*, "information" pushed from sales channels; "confirmation information is sent to… the property"; *see also* "application sends… notifications to the PA via communications over wired or wireless networks"; receiving information in "real time" over "Internet," "wired or wireless networks," etc. (*see* cl.1[b])) **for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[c]-[d], [f])**, sale data**[16] (*e.g.*, "information received from the sales channels" including, *e.g.*, "reservations," "reservation engine data," "sales channel data," reservation "confirmation information" including "Rate Type," "selling rate,"

[16] Jacob discloses "sale data" as required by cl.1[g]. To the extent it is argued further disclosure is required, as discussed below Jacob in view of Tamura, or Jacob in view of Kono, renders obvious "sale data."

"rooms sold" (Fig.42) on "day," "number of rooms in the reservation") **corresponding to at least one or more additional vendor computing devices** (*e.g.*, regarding inventory (*e.g.*, "hotel rooms," "time-dependent inventory") corresponding to an additional vendor computing device (*see* cl.1[a]) of, *e.g.*, an additional "Superuser"/"Engine Administrator"/"Property Administrator[]"—resulting in multiple "clients" from, *e.g.*, the same company (*e.g.*, at same or multiple "Properties" of the same company (*e.g.*, hotel chain))—selling through the same channel)**.**[17, 18]

[17] Jacob expressly discloses implementing RezTrip's "clients" such that "Individual Properties" are each clients, and thus multiple properties within, *e.g.*, a single hotel chain (*e.g.*, different "Taj" hotels) are each a RezTrip "client," each with at least one user (*e.g.*, "Superuser"/"Engine Administrator"/"Property Administrators," "hotel owners/employees") (*see* EX1004 (Jacob), Fig.12) with an associated vendor computing device to, *e.g.*, interact with a RezTrip computer/server (including its database). *See* EX1004 (Jacob), Fig.12 (listing multiple "Taj" properties).

[18] In addition, POSITA would have recognized that it would have been obvious and advantageous to use sale data corresponding not only to multiple vendor computing devices of Properties/groups of properties of the same, *e.g.*, hotel chain, but

325. **Jacob discloses receiving sale data.** For example, Jacob discloses, "In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations. ***The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations***." *E.g.*, EX1004 (Jacob), ¶[0009].

326. Jacob further discloses that "The system may further comprise a revenue management code segment. The revenue management code segment is used to analyze ***the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." *E.g.*, EX1004 (Jacob), ¶[0010].

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also to use sale data corresponding to vendor computing devices of Properties/groups of Properties of different hotel chains/companies selling on the same channel. This would have, *e.g.*, beneficially provided additional sale data based on which the RezTrip application would have determined a performance indicator used to make repricing decisions in, for example, situations in which there was not enough sale data from Properties belonging to a single hotel chain/company (*e.g.*, very few rooms available for sale from a particular hotel chain's/company's Properties) to determine a performance indicator.

327. Jacob further discloses an "analysis code segment," a "revenue enhancement code segment," and a "communications code segment": "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an ***analysis code segment, a revenue enhancement code segment***, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. ***The code segments comprise a system to manage*** the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items." EX1004 (Jacob), ¶[0006].

328. Jacob discloses that its communications code segment is, *e.g.*, "configured to management communications between the system and a plurality of sales channels" and thus receives (*e.g.*, causes the computer/server running, *e.g.*, the RezTrip application to receive) the sale data from the participant channels: "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The***

computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data. Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software. Embodiments of the invention may be located on one computer or on a plurality of

computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082]; *see also* EX1004 (Jacob), ¶[0008] ("In addition, Jacob disclose, *e.g.*, "The system comprises a pricing code segment configured to allow the property administrators to manage room pricing information. The pricing code segment comprises the pricing functions. The prior art pricing change process is illustrated in FIG. 4. A property administrator wishing to change rates for rooms must manage each room type, rate type, date, and constraint type combination individually. As the number of room types, rate types, dates, and constraints grow, the task of changing and/or managing the information grows geometrically. As illustrated in FIG. 5, embodiments of the invention define a matrix of relationships between room types, rate types, and room constraints. The pricing code segment functions by basing room prices upon the price of a standard room offered at the best available rate (BAR). For example, a standard single occupancy room may be

offered at a particular BAR. The hotel user then enters the rates of the other rooms as a function of the BAR. Double occupancy may command a rate of BAR plus an extra person charge, triple occupancy may command a rate of BAR plus 2 times the extra person charge. A deluxe room may be priced at 15% above BAR, or $50 above BAR, or some other figure based upon BAR. Prices based upon combinations of room type, occupancy, special discounts, group discounts, and preferred client pricing may be set. Once the matrix of the dependencies upon the BAR are set, the system can calculate the prices of the available rooms. The matrix of BAR dependencies needs only to be set once. Subsequent room pricing changes may be implemented by changing only BAR. The rest of the room prices and rates can be calculated automatically based upon the matrix of BAR dependencies. Individual room prices may be set manually, overriding prices calculated by the matrix of BAR dependencies. ***Once pricing changes have been implemented the results may be distributed through the communication code segment or code segments to the sales channels.*** By defining a matrix of relationships or hierarchies between room types, rate types, and constraints, embodiments of the invention allow PA's to modify one rate, for example the BAR rate of a standard room type, and have other rates (floating rates) automatically changed as illustrated in FIG. 6.").

329. Jacob further discloses that "***The system may be configured to communicate with the hotel staff, the hotel property management database, and a***

plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™, telephone reservation systems, a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems, and tour operators. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." *E.g.*, EX1004 (Jacob), ¶[0007].

330. Jacob additionally discloses, for example, "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." *E.g.*, EX1004 (Jacob), ¶[0083].

331. Figure 7 of Jacob further shows "Reservations" (i.e., sale data) received by Jacob's system (*e.g.*, computer/server running, *e.g.*, the RezTrip application) from each of the plurality of sales channels (such as "Internet Merchant[s]"):

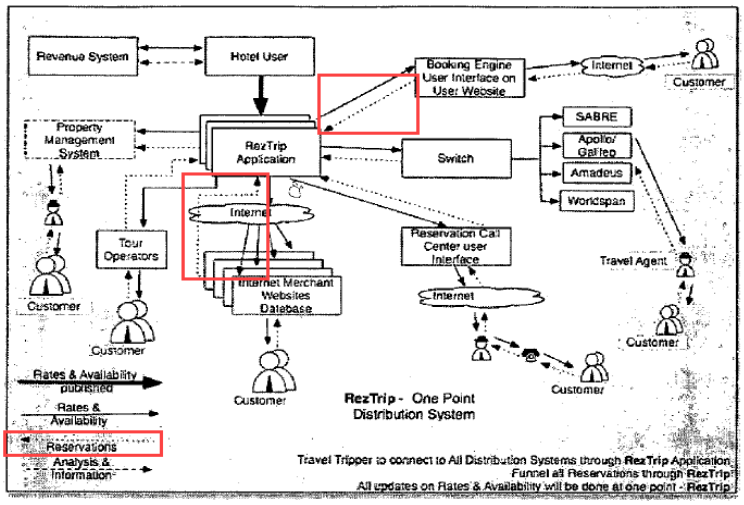


Figure 7

EX1004 (Jacob), Fig.7

332. Jacob explains that "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described." *E.g.*, EX1004 (Jacob), ¶[0085]; *see also* EX1004 (Jacob), ¶[0133] ("Communicate the prices to a

plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or communicate in response to a user initiated triggering event***, such as a mouse click.").

333. Jacob also discloses, for example, that "sales channel data," once received, is stored in, *e.g.*, Jacob's "computerized database": "***Embodiments of the invention comprise a computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, ***sales channel data***, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." *E.g.*, EX1004 (Jacob), ¶[0084].

334. Jacob discloses that such reservation data is received by Jacob's system every time an end user completes a reservation: "The reservation engine code segment is configured to manage reservation engine data and comprises reservation

engine functions. ***When an EU, using the reservation engine, successfully completes a reservation, a confirmation is sent to the EU. The application also notifies the PA to allow the administrator to perform the associated financial and administrative tasks. The application sends confirmations to the EUs and notifications to the PA via communications over wired or wireless networks*** in either an encrypted or unencrypted form. Typically, the communications will comprise an electronic mail message or a facsimile message." *E.g.*, EX1004 (Jacob), ¶[0192].

335. Jacob additionally discloses that "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The data relating to the Property are stored in the system database. The EA or SU then associates a PA with the property. The PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies, and later by managing inventory and room rates. Once the PA has set up the Property within the system, ***EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property***." *E.g.*, EX1004 (Jacob), ¶[0086].

336. POSITA would have understood that this is a disclosure of sending (and thus ***receiving*** by Jacob's computer/server running, *e.g.*, the RezTrip application)

sales data without a request made by Jacob's computer/server running the RezTrip application for such data, and thus would have understood that this is a disclosure of a "push" method of sending/receiving data.

337. Jacob also discloses that information received from the sales channels includes, *e.g.*, sale data such as "reservations," which includes reservation confirmation information including "Rate Type," "selling rate," "rooms sold" on a particular day, and the number of rooms in the reservation. *E.g.*, EX1004 (Jacob), ¶¶[0123], [0220], Fig.41. For example: "Each Room Type within the system will be entered with a default selling rate along with the inventory for each calendar date. However, the same rate may not be offered to everyone. In certain instances a discount may be offered to a group of EUs. Therefore, the code segment provides functionality to associate various Rate Types with each Room Type for a given date. For example, the rate for a standard room across a series of dates could be as follows." *E.g.*, EX1004 (Jacob), ¶[0123]; *see also* EX1004 (Jacob), ¶[0124], Fig.42:

	Standard Room-		
Rate Type	04/11/05	04/12/05	04/13/05
Default Rate	$139	$159	$199
AAA ™ Rate	$126	$144	$180
Government Rate	$130	$150	$190
Summer Package Rate	$100	$100	$100

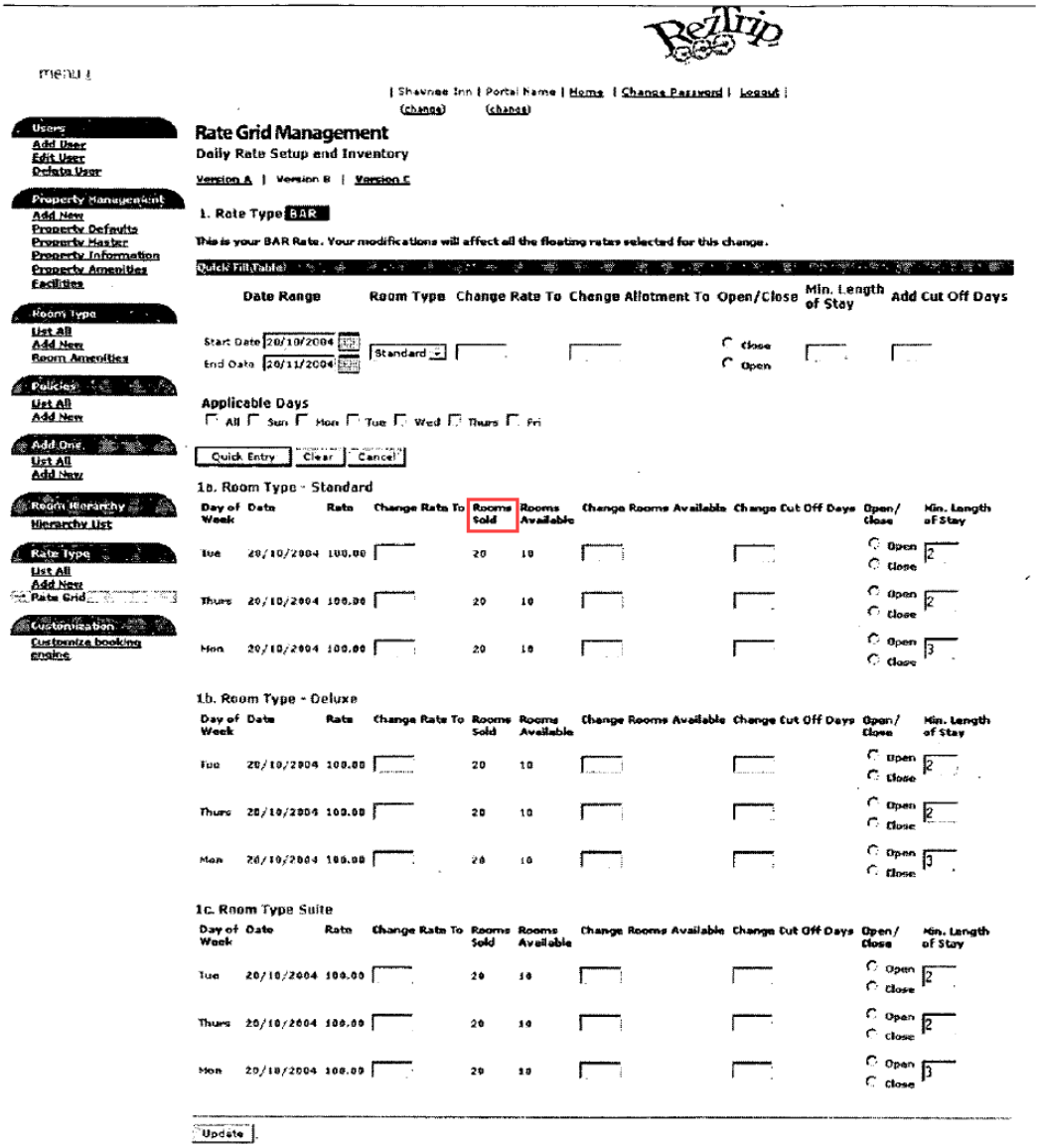

RezTrip
| Shawnee Inn | Portal Name | Home | Change Password | Logout |
(change) (change)
Users
Add User
Edit User
Delete User
Property Management
Add New
Property Defaults
Property Master
Property Information
Property Amenities
Facilities
Room Type
List All
Add New
Room Amenities
Policies
List All
Add New
Add Ons
List All
Add New
Room Hierarchy
Hierarchy List
Rate Type
List All
Add New
Rate Grid
Customization
Customize booking engine
Rate Grid Management
Daily Rate Setup and Inventory
Version A | Version B | Version C
1. Rate Type BAR
This is your BAR Rate. Your modifications will affect all the floating rates selected for this change.
Quick Fill(Table)
Date Range
Room Type
Change Rate To
Change Allotment To
Open/Close
Min. Length of Stay
Add Cut Off Days
Start Date 20/10/2004
End Date 20/11/2004
Standard
Close
Open
Applicable Days
All Sun Mon Tue Wed Thurs Fri
Quick Entry
Clear
Cancel
1b. Room Type - Standard
Day of Week
Date
Rate
Change Rate To
Rooms Sold
Rooms Available
Change Rooms Available
Change Cut Off Days
Open/ Close
Min. Length of Stay
Tue 20/10/2004 100.00 20 10 Open Close 2
Thurs 20/10/2004 100.00 20 10 Open Close 2
Mon 20/10/2004 100.00 20 10 Open Close 3
1b. Room Type - Deluxe
Tue 20/10/2004 100.00 20 10 Open Close 2
Thurs 20/10/2004 100.00 20 10 Open Close 2
Mon 20/10/2004 100.00 20 10 Open Close 3
1c. Room Type Suite
Tue 20/10/2004 100.00 20 10 Open Close 2
Thurs 20/10/2004 100.00 20 10 Open Close 2
Mon 20/10/2004 100.00 20 10 Open Close 3
Update

Figure 42

Multiplier	Details
Per stay	The charge would be added to the reservation and is not dependent on the number of travelers. It is multiplied by the number of rooms in the reservation. For example, high-speed internet priced at $50 If 3 rooms were booked the total charge would be $150.
Per occupant per stay	The charge would be per occupant for the duration of the stay. It does not depend on the number of nights. For example, airport pickup, $8 per person.
Per night	This is a charge per room per night. For example, parking, $24 per night.
Per occupant per night	For example, breakfast at $12. For 3 persons for a 3 night stay, the total charge would be $108 (12 × 3 × 3).

E.g., EX1004 (Jacob), ¶[0220].

338. Jacob explains that the "The Room Type and room rate that is shown to an EU using the reservation engine is based upon a ***rate grid*** that is maintained by the PA." *E.g.*, EX1004 (Jacob), ¶[0125].

339. Jacob further discloses that "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period***, the PA may adjust the price for rooms offered on that date. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." *E.g.*, EX1004 (Jacob), ¶[0176]. As discussed below, to the extent it is argued that "adjust[ing]" and "modify[ing]" must

be performed "automatically" without human intervention this is disclosed or rendered obvious. *See* cls.9[f], [g].

340. **Jacob discloses that the sale data** (discussed above) **is received in real time.** For example, Jacob discloses data is sent to the computer/server running, *e.g.*, the RezTrip application without the need for the system to issue a request for such data: "The reservation engine code segment is configured to manage reservation engine data and comprises reservation engine functions. ***When an EU, using the reservation engine, successfully completes a reservation, a confirmation is sent to the EU. The application also notifies the PA to allow the administrator to perform the associated financial and administrative tasks. The application sends confirmations to the EUs and notifications to the PA via communications over wired or wireless networks*** in either an encrypted or unencrypted form. Typically, the communications will comprise an electronic mail message or a facsimile message." *E.g.*, EX1004 (Jacob), ¶[0192]; *see also* EX1004 (Jacob), ¶¶[0086] ("The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The data relating to the Property are stored in the system database. The EA or SU then associates a PA with the property. The PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies, and later by managing inventory and room rates. Once the PA has set up the Property within the system,

EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property."), [0069]-[0070] ("As used herein ***a Portal refers to a Property or series of Properties managed as an entity. Users of the system may comprise owners of individual properties, owners of multiple properties, and others who may not own properties but instead agree to sell groups of rooms on a contract basis***. A direct Portal refers to all the Properties that are directly utilizing the services of the reservation engine. An indirect Portal refers to Properties that have contracted some or all of their rooms to an intermediary, and the intermediary has chosen to use the services of the reservation engine. A single physical Property can be part of either a direct portal or an indirect portal, or both. A portal is a logical grouping of rooms and/or properties that allows one person to manage groups of Properties/Rooms from a single point.").

341. Indeed, Jacob further discloses "Hotel reservation systems have been previously described, for example in U.S. patent application publications 2002/0152100, 2003/0144867, 2004/0249684, and in U.S. Pat. Nos. 5,832,451 and 5,832,454 all of which are hereby incorporated herein by reference. In addition to a system that accepts reservations, ***administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature***

of the marketplace, pricing and repricing inventory as necessary ***based upon changes in availability***, reservation date, weather, ***and other factors***. The system should allow the administrator to change the pricing of all items based upon class, occupancy, discounts, package deals, preferred client, or any other factor affecting price, with a minimum of data entry by the staff. While current systems support the marketing of package deals, administrators would benefit from a system that would allow consumers to define their own package deals, tailored to their individual preferences. ***The system should quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time. Such a system would insure that each sales channel would always be working with the most up-to-date pricing, availability, and other information.***" *E.g.*, EX1004 (Jacob), ¶[0005].

342. Jacob also discloses, for example, "The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" *E.g.*, EX1004 (Jacob), ¶[0185]; *see also* EX1004 (Jacob), ¶[0191] ("The ***communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions***. Once the Rate Types, Room Types, and

inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels. Other information communicated to the selling channels may comprise add-on information, package information, amenity information, and facility information. ***The information is communicated to the selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click.*** As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such as the internet*** or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form."), cl.5 ("The system of claim 1 further comprising ***a code segment configured to communicate pricing information and inventory information to a plurality of sales channels***."), cl.6 ("The system of claim 5 further comprising ***a code segment to automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***."), cl.1.

343. **Jacob discloses that the sale data** (discussed above) **is for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface and corresponding to at least one or more additional vendor computing devices.**

344. For example, Jacob discloses that its RezTrip application has multiple "clients": "The ***RezTrip™ application may have clients*** that comprise: A group of Properties[;] Individual Properties[;] Companies who may not own Properties, but have bought batches of Rooms from other properties to sell to clients. A management company or chain that owns several properties." *E.g.*, EX1004 (Jacob), ¶¶[0093]-[0097].

345. Jacob further discloses that "Property refers to any hotel, motel, resort or the like that sells its rooms/amenities/packages/items via the system and the reservations engine." *E.g.*, EX1004 (Jacob), ¶[0067]; *see also* EX1004 (Jacob), ¶¶ [0064] ("As used herein Superuser, or SU, refers to the user or group of users that can perform every action in the system ***across any portal and Property that exist in the system***. The SU has complete authority to manage any function available in the system."), [0065] ("As used herein an Engine Administrator, or EA is a user or group of users, similar to the Superuser, who can perform every action in the system, but only on properties and users which they have created in the system. An EA cannot view or edit details on properties/users created by other EA's.").

346. Jacob also discloses multiple "Portals," which contain, *e.g.*, "a Property or series of Properties": "The portal code segment is configured to manage Portal data and comprises Portal functions. ***A Portal refers to a Property or series of Properties managed as an entity.***" *E.g.*, EX1004 (Jacob), ¶[0092]; *see also* EX1004 (Jacob), ¶¶[0088] ("Upon login the SU is presented with the option of ***picking the portal they want to work*** within as shown in FIG. 13; no other action is possible until a portal has been chosen. After choosing a portal, menu functions become available. While a SU may perform all system and property management functions, properties are generally managed by less privileged EA and PA users."), [0099] ("As shown in FIGS. 13, 14, and 15, the system allows SUs to select portals; create new portals, enter portal data, to edit portals, and to activate/inactivate portals. ***Portals are created, edited, and activated/inactivated by clicking on the appropriate menu items on the relevant screens and entering the required data in the forms. Each portal may have Properties and users created within it. The associations between a Property and users are performed within the scope of a portal. A Property from one portal cannot be associated with an EA or a PA from another portal.*** EAs operate within the portal with which they are associated. SUs may operate on any portal in the system."), [0011] ("***During the course of working with a Property all SU, EA, and PA users are clearly shown the portal and the Property to which they are making changes.*** The administrative users (SU, EA, PA) have the ability to

change Properties, to move from one Property to another. ***If the user is logged on as SU then the user also has the ability to change portals.***"), [0113] ("As shown in FIG. 17, the PA enters property data on the 'Add Property' screen. The data comprise address information including street, city, state, country, postal code, as well as radio buttons indicating whether to display special rate types, default amenities, default property facilities, default bed types, and default common room attributes. ***After a Property has been added to the system it may be managed by selecting it from the Property list, as shown in FIG. 18. Selecting a Property from the Property list brings up a form displaying the default Property information as shown in FIG. 19.*** Default information comprises reservation transaction fee, active/inactive status, low inventory alert level, guarantee/cancellation policy, minimum room price, default currency, default date format, and check-in/check-out times."), Figs.12-13

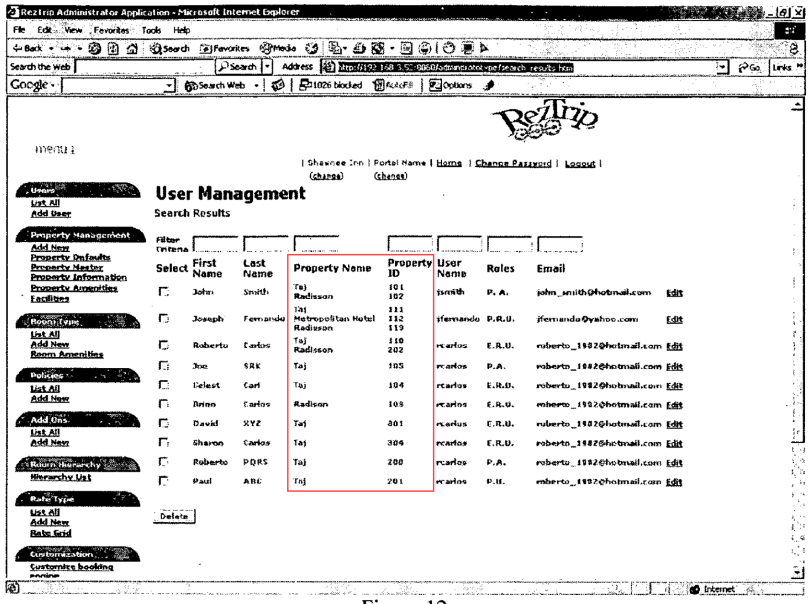


Figure 12

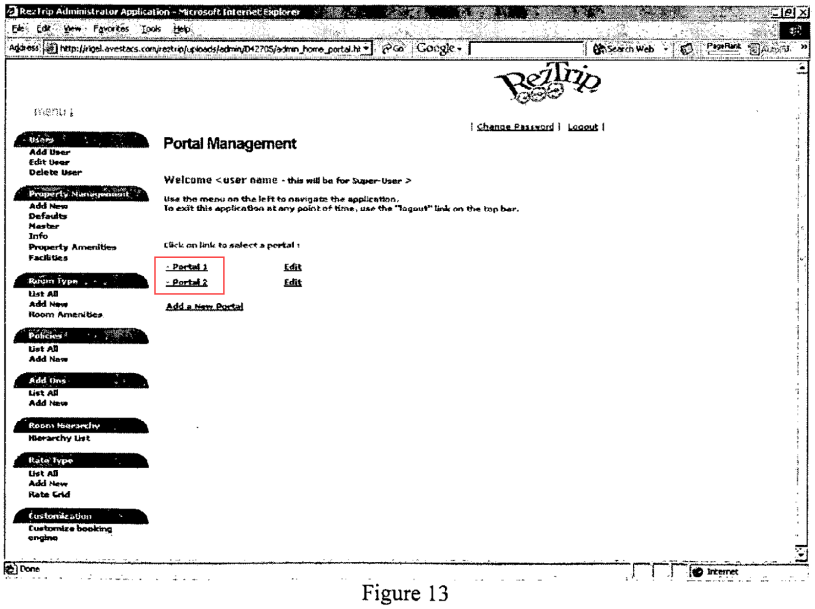


Figure 13

347. For example, Jacob expressly discloses that its system (*e.g.*, system running "RezTrip" Application) may have multiple users from the same company (*e.g.*, at the same or another "Property" in a particular hotel chain (each of which is a RezTrip "client")) selling through the same channel, and that Jacob's system includes "computer software or computer hardware or a combination of computer software and hardware" used by its users. *E.g.*, EX1004 (Jacob), ¶¶[0006], [0069], [0093]-[0097]. With respect to "vendor computing device" (*see* cl.1[a]), POSITA would have understood that Jacob expressly discloses multiple vendor computing devices corresponding to each of its vendors (*e.g.*, "Properties," or "groups of Properties" of the same company (*e.g.*, hotel chain) that sell through Jacob's plurality of sales channels) to *e.g.*, exchange information with a RezTrip

computer/server (including its associated "database"), or at minimum **would have found it obvious to implement Jacob (in the recited combinations) to do so**. POSITA would have further understood that the RezTrip computer/server receives sale data with respect to each of these additional vendor computing devices. Indeed, Jacob expressly discloses that the RezTrip application manages inventory for multiple Properties (*e.g.*, EX1004 (Jacob), ¶¶[0095]), "receive[s] information from the sales channels" (including whether all of a "sales channel's Room Type inventory is sold out," *e.g.*, EX1004 (Jacob), ¶[0180]) (*e.g.*, EX1004 (Jacob), ¶[0010]), and that "all Reservations" are "funnel[ed]" "through RezTrip," (*e.g.*, EX1004 (Jacob), Fig.7).

348. In my opinion, **POSITA would thus have understood that Jacob expressly discloses at least one or more additional vendor computing devices, and, as discussed below, receiving sale data corresponding to such computing devices.** At minimum, in my opinion, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's (in the recited combinations) disclosed companies (*e.g.*, hotel chains) with multiple properties (each of which is a RezTrip "client") using Jacob's disclosed computer software/computer hardware/combination of computer software/hardware such that the resulting system utilized one or more additional vendor computing devices (for use by, *e.g.*, Jacob's additional users of a company's**

property/properties), and received sale data corresponding to such additional vendor computing devices. This would have, *e.g.*, beneficially allowed the system and its additional clients/users/Properties to, *inter alia*, modify the active channel records using Jacob's disclosed computer hardware and software to, *e.g.*, update pricing information and/or inventory allocations in response to changing market conditions across multiple products from different vendors (*e.g.*, "Properties" of the same company (*e.g.*, hotel chain) within each channel, thus enabling updating of pricing information and/or inventory allocations based on conditions relating to the overall market for, *e.g.*, a hotel chain's inventory rather than just the market for a single vendor's inventory from, *e.g.*, a single hotel in the chain (or the inventory items associated with a single person/representative or group within a vendor). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels." *E.g.*, EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

349. Because Jacob's channels "push" data to RezTrip computer/server, without the system issuing a request (*e.g.*, EX1004 (Jacob), ¶[0086] ("After EU has

made a reservation, confirmation information ***is sent***")), **POSITA would have understood Jacob discloses receiving sale data in "real time**" (as soon as a reservation is made, *i.e.*, on an aperiodic basis). *See* §VI.C, above.

350. Thus, in my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.

351. To the extent it is argued further disclosure of "real time" as properly construed is required with respect to Jacob's disclosure of push, **this would have been rendered obvious based on Jacob (in the recited combinations) in view of Franklin**.

352. **Franklin discloses receiving** (*e.g.*, "data is sent… to one other machine" that receives it; "data delivery") **data** (*e.g.*, "data") **in real time** (*e.g.*, data transmitted by "push,") **from another computer** (*e.g.*, "data is sent from a data source")**.**

353. For example, Franklin discloses sending data from a source to, *e.g.*, another machine (and thus receiving by that "other machine"): "The third characteristic of data delivery mechanisms we identify is whether they are based on point-to-point or one-to-N communication. Using point-to-point, ***data is sent from a data source (e.g., a single server) to one other machine***…." *E.g.*, EX1009 (Franklin), ¶[0021].

354. Franklin also discloses a "push-based approach" to sending/receiving data and examples of its benefits: "The first distinction we make among data delivery styles is that of 'pull v. push.' Current database servers and object repositories manage data for clients that explicitly request data when they require it. When a request is received at the server, the server locates the information of interest and returns it to the client… ***In contrast, data dissemination involves sending information to a client population, possibly in advance of any specific request. This is referred to as a push-based approach… A pull-based approach requires the use of a backchannel for each request.*** Furthermore, the server must be interrupted continuously to deal with such requests and has limited flexibility in scheduling the order of data delivery." *E.g.*, EX1009 (Franklin), ¶¶[0015]-[0016]; *see also* EX1009 (Franklin), Fig.1 (especially Push→Periodic→P-to-P and Push→Periodic→P-to-P).

355. Franklin further discloses both "periodic" and "aperiodic" push: "Both push and pull can be performed in either an aperiodic or periodic fashion. Periodic delivery is performed on a regular, repeating schedule, while aperiodic has no such schedule." *E.g.*, EX1009 (Franklin), ¶[0018].

356. Additionally, Franklin details the advantages of periodic push. For example: "***Periodic push is useful for cases in which clients might not be available at all times or might be unable to react to what has been sent.*** Unavailability can

occur in mobile settings. It *might also occur in cases in which the client processing load is high*, this preventing the continual servicing of the incoming data stream…." *E.g.*, EX1009 (Franklin), ¶[0019]; *see also* EX1009 (Franklin), ¶[0041] ("Push Scheduling: For the push-based approaches, intelligent scheduling is necessary in order to obtain the maximal benefit from the available bandwidth….").

357. Jacob also discloses the preference for updating pricing and availability in "real time" (*e.g.*, EX1004 (Jacob), ¶[0005]) and that "[f]requent updating and communication… keeps the information fresh at the sales channel," *e.g.*, EX1004 (Jacob), ¶[0185]. However, while Jacob discloses sale data is transmitted from the channels without a request, Jacob does not use the word "push," and Jacob's push is aperiodic. Franklin explicitly discloses beneficially ***pushing*** data from a data source, and explains that among the advantages of push is that, unlike pull, push does not require a "backchannel" for each request, nor must the nodes providing the data (here, Jacob's sales channels) be continuously interrupted to deal with such requests (in both instances meaning less strain on, *e.g.*, Jacob's wireless communication networks (*e.g.*, EX1004 (Jacob), ¶[0082]), which may reflect network and other asymmetries). *E.g.*, EX1009 (Franklin), ¶¶[0006], [0005]-[0010], [0013], [0016], [0020]. Franklin additionally explains data sources can push data "in either an aperiodic or periodic fashion," and that ***periodic*** push (pushing data on a "***regular, repeating schedule***, while aperiodic has no such schedule") is

particularly useful where processing load is high at the node receiving data (another asymmetry), as Jacob's processor(s) running, *e.g.*, this function of the RezTrip application also performs the other functions of the RezTrip application. *E.g.*, EX1009 (Franklin), [0018]; *see also id.* [0019]-[0020], [0014], Fig.1.

358. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement communications between Jacob's channels and Jacob's RezTrip computer/server (in the recited combinations) using Franklin's beneficial teachings of push, including periodic push**. Periodic push would have beneficially allowed the system to "obtain the maximal benefit from the available bandwidth" as Franklin explains (*e.g.*, EX1009 (Franklin), ¶[0042]), and does not "assume[] that clients are either always listening and able to respond to what is being sent or that missing some information is not crucial to the application" (*e.g.*, EX1009 (Franklin), ¶[0019]). Further, in my opinion, periodic push affords POSITA a design option as to how frequently to schedule the push, providing increased flexibility, as POSITA would have recognized different benefits to scheduling push at very short or longer intervals,

depending on the particular practical application under consideration.[19] For example, Jacob acknowledges the benefit of "[f]requent updating" (*e.g.*, EX1004 (Jacob), ¶[0185]) and it would have been beneficial and obvious based on Jacob's disclosures above to implement Jacob's updating using Franklin's teachings of periodic push to schedule push at ***short intervals*** because this would facilitate

[19] Jacob teaches sending sale data as soon as the reservation is made (*i.e.*, aperiodically). *E.g.*, EX1004 (Jacob), ¶[0086]. To the extent it is argued that Jacob does not disclose this limitation under this interpretation, Franklin teaches aperiodic push. *E.g.*, EX1009 (Franklin), ¶[0026]. Though there are tradeoffs between periodic and aperiodic push, aperiodic push (like Jacob's transmission when data changes) ensures bandwidth is only used when there is an update and ensures the server has the most up to date information (similar to the benefits of periodic push at short intervals), and it would also have been obvious and advantageous to implement Jacob (in the recited combinations) using Franklin's teachings of aperiodic push with a reasonable expectation of success. *See* EX1009 (Franklin), ¶[0026]. Additionally, both periodic push and aperiodic push were well-known, well-understood implementation choices that POSITA would immediately have recognized as among the design options available for implementing Jacob's system.

Jacob's computer/server (running, *e.g.*, the RezTrip application) having more up-to-date information when processing the sale data. However, in other circumstances, such as in applications where individual sales and reallocations were expected to occur less frequently and where cost/efficiency concerns were a higher priority than near-term predictive accuracy, POSITA would have recognized it was beneficial to schedule push in the combined Jacob-Franklin system at ***longer intervals*** because, as of the priority date, sending data could be expensive and error-prone, and sending data less frequently in batches would generally have presented lower costs/more efficiency. And, whether with shorter or longer intervals (as discussed above), POSITA implementing Franklin's express teaching of periodic push (on a "regular, repeating schedule") in Jacob would additionally have found it obvious and advantageous to ***schedule each channel to push data in the same sequence in the same repeating interval*** (*e.g.*, every minute, every hour, or a smaller or greater interval as appropriate to the particular products and channels), with each channel associated with a different interval in the sequence, so that Jacob's processor would receive and be able to act on (*i.e.*, process) the new sale data for a channel in the same sequence in the same, repeating interval while additional sale data was being acquired for the *other* channels, beneficially: (a) allowing Jacob's processor to receive and process sale data from one channel at a time in succession (including processing rapidly in, *e.g.*, rapid succession), thus increasing efficiency (and

enabling faster speeds) while lowering processing load, latency, and overhead (including, *e.g.*, reducing the management required to deal with the possibility of collisions—data coming to the processor from different channels at the same time), and (b) allowing Jacob's processor to calculate new prices and reallocate inventory promptly after the last channel's data was received and processed. For POSITA it would have been routine to make these implementation choices, and (again, particularly in light of the express disclosures of Jacob and Franklin, and the existence of other similar systems using push transmission and calibrating to particular circumstances) clear they would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1029 (Phillips)[20] (discussing existing use of push (*e.g.*, at 135-136 ("*Periodic updates* occur at scheduled intervals"; "*Event driven updates* [that] are triggered by events such as a **booking class closing**, a change in aircraft, and an **unanticipated spike in demand**.") (italics original), and context-specific timing based on "cadence" of transactions (*e.g.*, at 30 ("The operational PRO activities

[20] To the extent it is argued that further disclosure of event-triggered updates is required, this would have been rendered obvious by the disclosures of Phillips (which is already part of the recited combinations) for the same reasons as those set forth immediately above for Franklin.

work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***. Revenue managers review the recommendations of the system on a daily basis. ***Other companies may update prices weekly or monthly***. In any case, the ***core operational activities will be similar***."), 30 ("In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations"), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity. As discussed in Chapter 1, the adoption of computerized distribution systems—an early form of e-commerce—by the passenger airlines was a direct contributor to the ability of the airlines to develop, manage, and update highly complex fare structures.[] ***Pricing has a different cadence in every industry***."), 126 ("at the heart of these systems are the ***booking***

control mechanisms that determine moment by moment which fare classes are available for sale and which are not."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***. In effect, the airlines were wrestling with the complexities of e-commerce well before the arrival of the Internet. The necessity to continually monitor demand and update prices accordingly will be felt by more and more industries as electronic distribution channels such as the Internet become more pervasive")))).

359. To the extent it is argued that "real time" required that data be sent relatively quickly/frequently, "real time" in the temporal sense (including with periodic push over vanishingly short intervals, which POSITA would have understood would ensure "fresh[er]" data (*e.g.*, EX1004 (Jacob), ¶[0185]) in situations with unexpectedly rapid sales or requests for reallocation/re-pricing) would also have been obvious for the reasons described above. For POSITA it

would have been routine to make these implementation choices, and (again, particularly in light of the express disclosures of Jacob and Franklin and the existence of other similar systems with extremely rapid processing/transmission) clear they would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1029 (Phillips)[21] (discussing extremely rapid processing/transmission (*e.g.*, at 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems,

[21] To the extent it is argued that further disclosure of "real time" in the temporal sense is required, this would have been rendered obvious by the disclosures of Phillips (which is already part of the recited combinations) for the same reasons as those set forth immediately above.

SABRE and Galileo, were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***."), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity."))).

360. Thus, in my opinion Jacob (in the recited combinations) in view of Franklin renders obvious this limitation.

361. Alternatively, to the extent it is argued further disclosure of receiving ***sale data*** is required, **it would have been obvious based on Jacob (in the recited combinations) in view of Tamura**.

362. **Tamura discloses receiving** (*e.g.*, "merchandise distribution management server" "receives sales information from POS terminals at each retail store") **sale data** (*e.g.*, data reflecting "number of units sold") **for one or more**

participant channels (*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d])**.**

363. For example, Tamura discloses that "The invention is provided with a price determination part 22 that determines the reference retail price for items sold based on the ***amount of inventory and the number of parts sold during the part period for each item sold which is stored in a merchandise distribution management server 10***; an allocation calculation part 24 that calculates the allocation quantity of the items for each retailer; an allocation buying price calculation part 26 that calculates the allocation buying price for each retail outlet based on the allocation quantity of the items; a buying price at the time of sale calculation part 28 that calculates the stocking price of the sold item based on the reference retail price at this stage when the purchased items based on the allocation quantity are sold by each retailer; and a returned goods settlement amount calculation part 29 that calculates the returned goods settlement amount according to the unsold quantity and returned goods fee for the items purchased by each retailer based on the quantity allocated thereto." *E.g.*, EX1005 (Tamura), Means of Solving the Problems.

364. Tamura further discloses that its merchandise distribution management server, *inter alia*, receives and stores the sale data. For example, "The sales management method of the present invention that achieves these objectives, as

shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100)***; a step to determine the reference retail price ***based on the inventory quantity of the items and the number of units sold*** during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." *E.g.*, EX1005 (Tamura), ¶[0014].

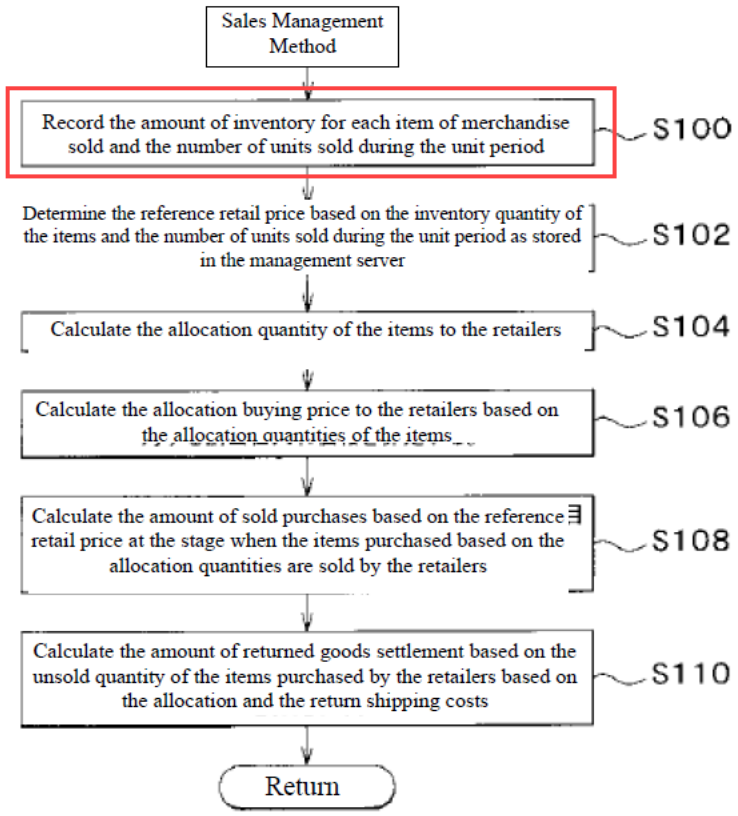
365. Tamura also discloses that its sale data includes, *e.g.*, inventory quantity for each item of the sold merchandise, number of units sold, and the retailer identification of the sold merchandise: "Following is a description of the flow of merchandising transactions in the sales management system thus configured. Fig. 2 is a flowchart describing the sales management method. ***First, the inventory quantity for each item of the sold merchandise and the number of units sold during the unit period are stored in the merchandise distribution management server 10***

(S100), as well as the retailer identification information of the sold merchandise. Additionally, the merchandise distribution management server 10 also stores information related to each item of sold merchandise, such as the item number, allocated buying price, reference retail price, sold purchase amount, and returned goods settlement amount. Such information related to each item of merchandise sold may be identified and managed, for example, by means of tags attached to the merchandise sold." EX1005 (Tamura), ¶[0024]; *see also* EX1005 (Tamura), ¶¶[0013] ("The sales management system of the invention, for example, as shown in Fig 2, preferably further comprises ***a sales rep part 50 that manages the sales progress rate for each retailer of the items among a predetermined number of retailers based on the allocation quantity***; and the sales rep part 50 is authorized to transfer the items from retailers having a ***low sales progress relative to the allocation quantity to retailers having a high sales progress rate***."), [0019] ("The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a***

sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and with reference to the merchandise's distribution market."), [0025] ("Next, the price determination part 22 sets a reference retail price based on the inventory quantity of the item in question and ***the number of units sold during the unit period as stored in the merchandise distribution management server 10 (S102)***. The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based on the allocation buying price and the allocation quantity of the item."), cl.4 ("The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate."), cl.5 ("A sales management method for executing each step using a computer:

recording the inventory and the number of units sold during the unit period for each item of merchandise for sale; determining the reference retail price based on the inventory and the number of units sold during the unit period of the item as stored in the management server; calculating the allocated quantity of the items for each retailer; calculating the allocated stocking price of the items for each retailer based on the allocated quantity of the items; calculating stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and calculating the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity."), Fig.2:

Fig. 2



366. Tamura further discloses, *e.g.*, "The sales rep part 50 ***manages the sales progress rate for each retailer with respect to the items between a predetermined number of retailers based on the allocation quantity***. The ***sales rep part 50 has the authority to transfer items from a retailer with a low sales progress rate in relation to the allocation quantity to retailers with a high sales progress rate***. A computer or information processing terminal connected to a communication line network may, for example be used. Sales reps (sales managers) who use the sales rep part 50 have a shared incentive to maximize sales within a group of merchandise among retailers and merchandise planning entities. For example, sales reps are assigned to a certain

area by region, and if a certain product is not selling well at certain retailers within their area, they have the authority to transfer the merchandise to another retail store under their jurisdiction." *E.g.*, EX1005 (Tamura), ¶[0035].

367. In addition, Tamura discloses that its sales management system is connected to its merchandise distribution management server and point-of-sale terminals: "Fig. 1 is a block diagram of the overall configuration of a sales management system illustrating a first embodiment of the invention. ***In the figure, the sales management system 20 is connected to a merchandise distribution management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period.*** For example, the server receives sales information from POS terminals at the retail stores, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise distribution management server 10 is also transmitted to the manufacturers' production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer's side, sales department personnel

use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as to evaluate the selling capabilities of each retailer." *E.g.*, EX1005 (Tamura), ¶[0017]; *see also* EX1005 (Tamura), Figs.1, 3:

Fig. 1

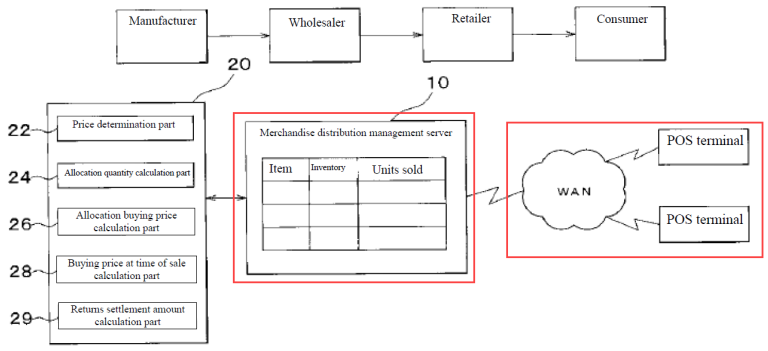
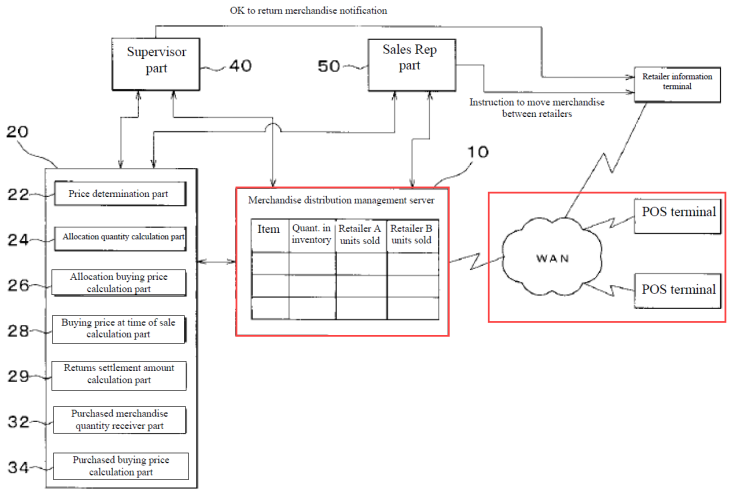


Fig. 3



368. Tamura additionally discloses, for example, "Fig. 3 is a block diagram of the general configuration of a sales management system which illustrates a second embodiment of the invention. This embodiment shows a situation in which merchandise is allocated not only by a merchandise planning entity such as a manufacturer, but also merchandise which is purchased by retailers that are handled as a group***. In the figure, the sales management system 20 is connected to the merchandise distribution management server 10, to the POS terminals installed in each retail store, and to a network, as well as to the supervisor part 40 and to the sales rep part 50.*** The sales management system 20 is designed to handle both merchandise allocated by a merchandise handling entity such as a manufacturer and merchandise which is purchased by retailers, and in addition to the value determination part 22, the allocation quantity calculation part 24, the allocation purchase price calculation part 26, the purchase price at time of sale calculation part 28, and the returned goods settlement amount calculation part 29 as described in Embodiment 1, the system also includes purchased merchandise quantity receiver part 32 and a purchased buying price calculation part 34." *E.g.*, EX1005 (Tamura), ¶[0031].

369. Tamura further discloses that it receives sale data "[e]ach time the item is sold": "Next, the time-of-sale purchase-price calculation unit 28 calculates the post-sales buying price, based on the reference retail price, at the stage when the

item purchased based on the allocation quantity is sold at each retail store (S108). ***Each time the item is sold, at each retail store, sales information is transmitted from the POS terminal to the sales management system 20 and the merchandise distribution management server 10.***" *E.g.*, EX1005 (Tamura), ¶[0026].

370. Both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. Jacob further discloses receiving sale data such as "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate." *E.g.*, EX1004 (Jacob), ¶¶[0086], [0123]-[0125], [0176], [0192]. As discussed, Jacob further discloses "[a]fter an EU has made a reservation, confirmation information is sent to both the EU as well as the property." *E.g.*, EX1004 (Jacob), ¶¶[0067] ("Property refers to any hotel, motel, resort or the like that sells its rooms/amenities/packages/items via the system and the reservations engine."), [0086]. Jacob further discloses "[f]requent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channel." *E.g.*, EX1004 (Jacob), ¶[0185]. And, as discussed, Franklin

describes how to efficiently communicate data in a "distributed information system." *E.g.*, EX1009 (Franklin), ¶¶[0001], [0016] ("distributed system infrastructure is responsible for delivering data to all relevant subscribers"). Tamura discloses that sale data is pushed from retailers to the merchandise distribution management server ("each time the item is sold, sales information [sale data, including "number of units sold"]) is transmitted from the POS terminal to the sales management system 20 and the merchandise distribution management server 10") and that Tamura's sales information includes the "number of units sold." *E.g.*, EX1005 (Tamura), ¶¶[0014], [0017], [0019], [0024], [0026], cl.5, Fig.2.

371. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's RezTrip computer/server (in the recited combinations) using Tamura's beneficial teachings of receiving sale data from distribution channels.** Receiving sale data corresponding to the combined system's one or more additional vendor computing devices would have advantageously increased the RezTrip computer/server's ability to fulfill Jacob's express goal of "maximiz[ing]… revenue," Evangelist's express goal of "promot[ing] efficient operations" of its inventory management system, and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, providing the system or user of the system with information about *e.g.*, total inventory sold, and remaining inventory and increasing the ability of the system or user of the system to

monitor changing market conditions/demand by reallocating inventory and/or adjusting price in response to changing market conditions. *See also* EX1004 (Jacob), ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). For POSITA (particularly in light of these express disclosures and the existence of similar systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.,* EX1029 (Phillips), 135 ("These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights***"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan.[] ***Each GDS*** distributes schedule, fare, and booking availabilities to the agencies and ***transmits bookings and cancellations from the agencies to the airlines***.").

372. Thus, in my opinion, Jacob (in the recited combinations) in view of Tamura renders obvious this limitation.

373. To the extent it is argued that further disclosure of receiving ***sale data*** is required, **it would have been obvious based on Jacob (in the recited combinations) in view of Kono**.

374. **Kono discloses receiving** (*e.g.*, "acquir[ing]") **sale data** (*e.g.*, "product shipment information and product inventory information of each agency"; "agency sales information") **for one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d])**.**

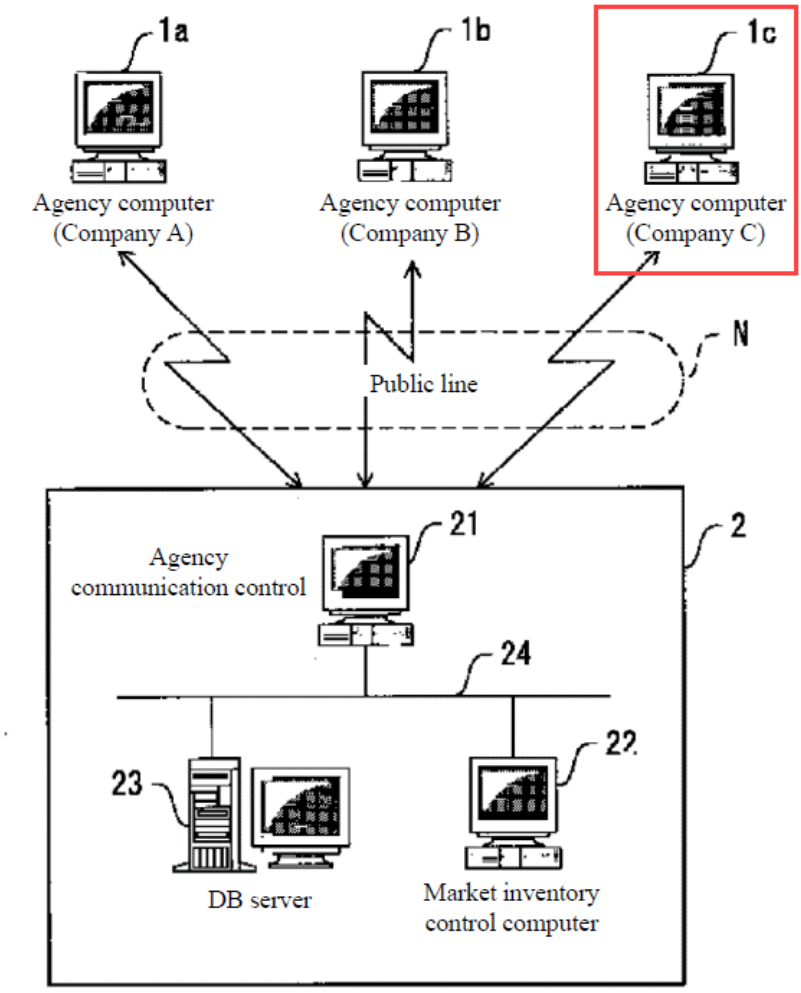
375. For example, Kono discloses: "According to the present invention having such characteristics, ***by connecting the manufacturer server device and the terminals of each agency by a direct network, the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each agency in real time***. The manufacturer server device estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and monthly sales index data of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, transfer (resale, etc.) of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." *E.g.*, EX1007 (Kono), ¶[0010].

376. Kono also discloses, for example, "[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer

server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, the manufacturer server device is provided with: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses. Moreover, the above configuration is further provided with: ***an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means***; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and the sales index of each agency stored in the agency shipment information database and the sales index database, estimate the sales volume of the product on the overall market and performs a sales analysis at each agency." *E.g.*, EX1007 (Kono), ¶[0009]; *see also* EX1007 (Kono), ¶[0026] ("FIG. 2 illustrates an example of various databases

controlled by the database server 23. Three kinds of databases controlled by the database server 23 are prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the ***agency sales information database 23b***. Moreover, monthly sales indexes of the previous year and current year are saved in the sales index database 23c. In the database server 23, these data are updated daily so that the data can be stored and analyzed. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software."), Figs.1, 4:

[FIG. 1]



[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

377. Kono further discloses, "According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network***, can acquire product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time***. The maker estimates the sales volume of the product on the overall market based on the ***acquired product shipment information of each agency and sales index of the product***, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." *E.g.*, EX1007 (Kono), ¶[0014]; *see also* EX1007 (Kono), ¶¶[0024] ("This system is configured such that agency terminals 1a, 1b, 1c, ... installed at each agency having transactions and a server device 2 of the manufacturer (maker side) are connected via a network (public line) N. However, the agency terminals 1a, 1b, 1c, ... and the manufacturer server device (hereinafter referred to as the maker-side server device) 2 may be connected by a communication network such as the Internet."), [0025] ("Moreover, the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a

database server 23 by a LAN 24 or the like. Moreover, the market inventory control computer 22 is provided with: acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency from each agency terminal 1a, 1b, 1c, ...; ***analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency***; and ***transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instructing transfer between warehouses.").

378. Both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Jacob further discloses receiving sale data such as "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate." EX1004 (Jacob), ¶¶[0086], [0123]-[0125], [0176], [0192]. Jacob further discloses "[f]requent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channel." *E.g.*, EX1004

(Jacob), ¶[0185]. And, as discussed, Franklin describes how to efficiently communicate data in a "distributed information system." *E.g.*, EX1009 (Franklin), ¶¶[0001], [0016] ("distributed system infrastructure is responsible for delivering data to all relevant subscribers"). Kono explicitly discloses receiving sale data from each distribution channel. *E.g.*, EX1007 (Kono), ¶¶[0010], [0014]. Jacob further discloses "[a]fter an EU has made a reservation, ***confirmation information is sent to… the property***." *E.g.*, EX1004 (Jacob), ¶¶[0067] ("Property refers to any hotel, motel, resort or the like that sells its rooms/amenities/packages/items via the system and the reservations engine."), [0086]. Kono further discloses receiving sale data from each distribution channel and that "agency terminals" and "the manufacturer server device" "may be connected by a computerized communication network such as the Internet. EX1007 (Kono), ¶¶[0024]-[0025].

379. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's RezTrip computer/server (in the recited combinations) using Kono's beneficial teachings of receiving sale data from distribution channels.** As discussed, receiving sale data corresponding to the combined system's one or more additional vendor computing devices would have advantageously increased the RezTrip computer/server's ability to fulfill Jacob's express goal of "maximiz[ing]… revenue," and Evangelist's express goal of "promot[ing] efficient operations" of its

inventory management system by, *e.g.*, providing the system or user of the system with information about *e.g.*, total inventory sold, and remaining inventory and increasing the ability of the system or user of the system to monitor changing market conditions/demand by reallocating inventory and adjusting price in response to changing market conditions. *See also* EX1004 (Jacob), ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). For POSITA it would have been routine to make such an implementation choice, and (particularly in light of these express disclosures and the existence of similar systems) clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.,* EX1029 (Phillips), 135 ("These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights***"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan.[] ***Each GDS*** distributes schedule, fare, and booking availabilities to the agencies and ***transmits bookings and cancellations from the agencies to the airlines***.").

380. Thus, in my opinion, Jacob (in the recited combinations) in view of Kono renders obvious this limitation.

i. Element 1[h]

381. Claim 1[h] recites **"determining a performance indicator[22] in real time,[23] for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, based at**

[22] The '047 patent states a "performance rating can be in the form of a number of parameters. For example, it could be related to a surplus or deficit percentage related to supply and demand of particular inventory items." EX1001 ('047 patent), 6:46-49; *see also* EX1001 ('047 patent), 4:45-47 ("determination of whether or not supply of inventory to each channel 18 exceeds demand"), 6:25-33. Although '047 uses the phrase "performance indicator," POSITA would have understood that these examples of "performance rating[s]" are also "performance indicator[s]." As discussed further below, POSITA would have recognized that examples of "performance ratings"/"performance indicators" in the '047 patent include parameters that (like Tamura's low and high sales progress rates, etc.) are "related to a surplus or deficit percentage related to supply and demand or particular inventory items" or "whether or not supply of inventory to each channel… exceeds demand," *e.g.*, EX1001 ('047 patent), 6:46-49, 4:43-47, 6:25-33.

least on the sale data corresponding to said at least one or more additional vendor computing devices." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation. Alternatively, in my opinion, Jacob (in the recited combinations) in view of Phillips renders obvious this limitation, Jacob (in the recited combinations) in view of Tamura renders obvious this limitation, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.

382. In my opinion, **Jacob discloses determining** (*e.g.*, "analyz[ing] the information received from the sales channels"; combining (*e.g.*, adding, averaging,

[23] I understand that, in cl.1[g], above, "receiving, in real time" indicates receiving the most recent data "pushed" (sent by "push" method) from the channels, and that, in cl.1[h], "determining a performance indicator in real time" indicates that this most recent received "pushed" data is processed to determine a performance indicator. In my opinion, under this interpretation, Jacob (in the recited combinations) discloses or Jacob-Phillips (in the recited combinations) renders obvious "determining… in real time." To the extent it is argued that further disclosure of "real time" in the temporal sense is required, this would have been rendered obvious as described above.

etc.) data across individual "reservations"; "perform[ing] calculations automatically[24] and/or perform[ing] calculations in response to a user initiated triggering event") **a performance indicator** (*e.g.*, parameter showing "sales channel's Room Type inventory is sold out"; parameter such as speed of sales in channel for inventory item(s) (indicating, *e.g.*, "day within the Rate Type active period is selling more quickly than other days in the period" or "might be selling out," etc.)) **in real time** (*e.g.*, based on most recent received data "pushed" from channels (*see* 1[g]); "rate management process may be repeated on a regular schedule… depending upon the needs of the Property")**, for each of the one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[d], [f])**, based at least**

[24] I understand that the '047 patent does not require "automatic" performance of steps without human intervention. Rather, '047 expressly contemplates user input to its system. *E.g.*, EX1001 ('047 patent), 5:11-14 ("vendors or an administrator… can set a rate of change"), 30:59-67 ("interface used by a vendor"), 31:54-60 ("interface to permit the Property to lock inventory"). To the extent "determining" "automatically" or without human intervention is required, Jacob discloses this limitation or Jacob (in the recited combinations) in view of Phillips, Tamura, or Kono renders this limitation obvious. *See also* cl.1[pre].

on the sale data corresponding to said one or more additional vendor computing devices (*e.g.*, all "Room Type inventory" or particular "Rate Type" of a particular company available on a "sales channel" (*e.g.*, "a sales channel's Room Type inventory is sold out or is selling better than other channels"; "a day within the Rate Type active period is selling more quickly than other days in the period"); *see* cl.1[g])**.**

383. For example, Jacob discloses "The system may further comprise a revenue management code segment. The ***revenue management code segment is used to analyze the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." *E.g.*, EX1004 (Jacob), ¶[0010], Fig.7:

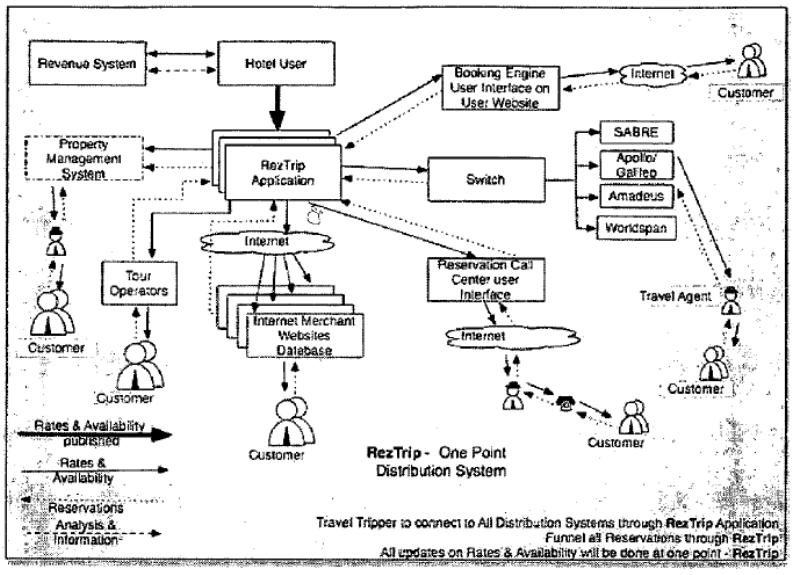


Figure 7

384. In addition, Jacob expressly discloses that its system (which includes code segments) performs calculations: "Calculate[s] the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." *E.g.*, EX1004 (Jacob), ¶[0131].[25]

385. **Jacob further discloses obtaining a performance indicator in real time for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, based on at least sale data corresponding to said at least one or more additional vendor computing devices (*e.g.*, sale data corresponding to sales (*e.g.*, "reservations") of, *e.g.*, all "Room Type" inventory (*e.g.*, "standard" room type at different "Properties") of a particular company on a particular sales channel,**

[25] I note that although paragraph 131 of Jacob refers to "the code segment" in this statement, POSITA would have understood that because one or more of Jacob's "code segments" constitute a "computer program system," Jacob's other code segments, such as the "revenue management code segment" and "analysis code segment" also "perform[] calculations automatically," including as to received sale data. *E.g.*, EX1004 (Jacob), ¶¶[0006], [0010].

corresponding to multiple vendor computing devices of a company, all of which are "funnel[ed]" through RezTrip (*see* cl.1[g]). For example, Jacob discloses determining "***If a sales channel's Room Type inventory*** *is sold out or* ***is selling better than other channels***, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to ***close the Rate Type***/Room Type, for a given date or a series of dates, ***for certain channels***." *E.g.*, EX1004 (Jacob), ¶[0180]; *see also* EX1004 (Jacob), ¶[0176] ("The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates.").

386. Jacob also discloses, for example, determining that a "day within the Rate Type active period is selling more quickly than other days in the period": "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that ***might be selling out*** soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in

response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." *E.g.*, EX1004 (Jacob), ¶[0176].

387. Jacob further discloses "The ***rate management process may be repeated on a regular schedule***, such as twice daily, daily, twice weekly or weekly ***depending upon the needs of the Property***. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" *E.g.*, EX1004 (Jacob), ¶[0185].

388. In my opinion, POSITA would have understood Jacob's express disclosures of "perform[ing]" price calculations (including "automatically"/without human intervention) using, *e.g.*, code segments "to analyze the information received from the sales channels" (including information corresponding to additional vendor computing devices, *see* cl.1[g]), and receiving sale data relating to a sale price of each item (*e.g.*, EX1004 (Jacob), ¶¶[0006], [0010], [0131]-[0133]; cl.4 (*e.g.*, "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate"), to apply to performing calculations as to ***prices*** (as discussed above) to determine, *e.g.*, "a day… is selling more quickly than other[s]" such that "date['s]" "price" should be "adjust[ed]" (*e.g.*, EX1004 (Jacob), ¶[0176] or a "Rate Type"

"closed" (*e.g.*, EX1004 (Jacob), ¶[0180])—and "***inventory***"[26]—to determine, *e.g.*, remaining "Rooms Available," whether "a sales channel's" "inventory" is "selling out"/"sold out" (or—*see* cl.1[i]—"selling better than other channels")—and as requiring calculations of speed/current inventory. *E.g.*, EX1004 (Jacob), ¶[0180], Fig.41. Jacob further discloses the importance of keeping "information fresh at the sales channels," "insur[ing] [sic] that each sales channel would always be working with the most up-to-date pricing, availability and other information," and that inventory management systems should "quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time." *E.g.*, EX1004 (Jacob), ¶[0005].

389. Thus, in my opinion, **POSITA would have understood that Jacob (in the recited combinations) discloses determining (using both price and inventory data) a performance indicator in real time (from the most recent "pushed" data received (including, *e.g.*, in rapid succession) by Jacob's system** (*see* cl.1[g])**) for**

[26] Jacob thus discloses or at minimum renders obvious the additional limitation added by claim 2, infra, which recites "the processing… comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per online distribution channel."

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each of Jacob's participant channels based on at least sale data corresponding to at least one or more additional vendor computing devices (*see* cl.1[g])**.** Alternatively, **POSITA would at minimum have recognized that in order to determine, *e.g.*, "a day within the Rate Type active period is selling more quickly than other[s]," such that prices should be "adjust[ed]," remaining "Rooms Available," and whether a sales channel's "inventory" is "selling out" or "sold out" (and enabling determining whether it "is selling better than other channels"), Jacob necessarily, and thus inherently, performs calculations as to both prices and inventory to determine a performance indicator (*e.g.*, a speed of inventory item sales in "the sales channels," *e.g.*, EX1004 (Jacob), ¶[0010]) in real time for each participant channel based on sale data corresponding to at least one or more additional vendor computing devices.**

390. Even if, *arguendo*, "real time" required determining a performance indicator based on at least the sale data corresponding to one or more additional vendor computing devices relatively quickly/frequently, "real time" in the temporal sense (including using the most recent data pushed periodically over vanishingly short intervals) **would have been obvious based on Jacob (in the recited combinations).** POSITA would have understood determining a performance indicator for each sales channel in real time would ensure "fresh[er]" data (*e.g.*, EX1004 (Jacob), ¶[0185]) in situations with unexpectedly rapid sales or requests for

re-pricing. For POSITA it would have been routine to make these implementation choices, and (again, particularly in light of the express disclosures of Jacob and the existence of other similar systems with extremely rapid processing/transmission) clear they would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1029 (Phillips) (discussing extremely rapid processing/transmission (*e.g.*, at 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***."), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of***

pricing decisions. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity.")))).

391. Thus, in my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.

392. Alternatively, to the extent it is argued further disclosure of determining a performance indicator based on at least the sale data corresponding to one or more additional vendor computing devices in "real time" in the temporal sense is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Phillips**.

393. **Phillips discloses automatically/without the need for human intervention carrying out the revenue management process determining** (*e.g.*, "recommend actions based on sophisticated mathematical algorithms," "calculate[s]… booking limits," "software and analytical capabilities," "forecasts… based on current and recent bookings"), **including based on sale data** (*e.g.*, "feed of bookings," "based on current and recent booking"), **a performance indicator in**

real time (*e.g.*, "moment by moment" calculation of, *e.g.*, "return"; "a price-response function associated with each combination of product, market-segment, and channel… The price-response function specifies demand for the product of a single seller as a function of the price"; demand/"anticipated changes in demand" for a "seller"; "revenue per available seat mile, or RASM"). *See also* cl.1[pre], [i].

394. For example, Phillips discloses performing calculations automatically: "Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function[, and t]hese departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms." *E.g.*, EX1029 (Phillips), 121.

395. Phillips further discloses: "[A]t the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***… Within a very short time (**typically less than 200 milliseconds**), the reservation system needs to send a message whether or not [a reservation] request can be accepted." *E.g.*, EX1029 (Phillips), 136; *see also* EX1029 (Phillips), 30 ("In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations"), 29 ("Successful ***pricing and revenue optimization*** involves two components…. The ***software and analytical capabilities required to support the***

process. Much of the interest in pricing and revenue optimization has focused on its use of ***mathematical analysis***. ***Quantitative analysis*** is indeed critical in most pricing and revenue optimization settings, but it cannot provide sustainable improvement unless it is ***embedded in the right process***."), 131 ("The job of ***tactical revenue management*** is to ***calculate and periodically update booking limits***"), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***").

396. Phillips discloses that these determinations are made based on, *e.g.*, sale data. For example, Phillips describes: "**Revenue management systems.** The primary job of a revenue management system is to calculate and update the booking limits within the reservation system… The revenue management system receives a feed of bookings and cancellations from the reservations system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems." *E.g.*, EX1029 (Phillips), 134-135 (bold original); *see also* EX1029 (Phillips), 135 ("These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights***").

397. Phillips further discloses obtaining a performance indicator based on these determinations. For example, Phillips states: "To get a better view of the revenue picture, ***airlines began to look at yield*** in addition to load factor. Yield is ***simply revenue per passenger mile***. Like load factor, it ***can be measured at any level*** from flight to market to entire airline. It was sometimes stated that the goal of managing bookings should be to increase yield—hence the term yield management, which was the original name for what is now more commonly called revenue management. Unfortunately, ***yield alone*** is a very ***imperfect metric*** since it ignores flight capacity. The strategy for increasing the yield from a flight is the exact opposite from that for increasing load factor—reject all early-booking demand and accept only late-booking high-yield passengers. This policy would maximize yield but would be disastrous for the airline, since it would result in flights that were empty except for a few high-paying business passengers. What the airlines really needed was a metric that combined the capacity focus of load factor with the revenue focus of yield and recognized that the goal of revenue management is to maximize the return from resources. For an airline, these resources are seats, and the airline needs to maximize revenue from available seats. Since prices for products are at least somewhat proportional to distance, it helps to normalize by distance and to ***measure revenue per available seat mile, or RASM***. ***An airline that flies a 100-seat aircraft on an 1,800-mile flight (about the distance from Chicago to San Francisco) with***

a total revenue of $50,000 has just achieved an RASM of $50,000/(100 & 1,800) = $0.28 for that flight." *E.g.*, EX1029 (Phillips), 140-141; *see also* EX1029 (Phillips), 106-107 ("a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity"), 135 ("Revenue management systems recommend booking limits for each product/fare class combination. Effective revenue management requires that these recommendations be continually monitored and reviewed. For example, Delta Airlines employs a group of more than 30 "revenue management analysts" who continually monitor the forecasts and booking limits generated by Delta's revenue management system."), 29 ("Finally, a manufacturer may also be selling some cars directly to the public through a deal with an ***online channel***. In this case, the ***manufacturer needs to apply pricing and revenue optimization across the entire range of its channels and pricing mechanisms in order to maximize total profitability***.").

398. In my opinion, POSITA would have understood that Phillips's disclosure of measuring "revenue per available seat mile, or RASM" is an example of revenue (over time) per allocated unit of inventory.

399. In addition, Phillips discloses, "For a company with many ***products being sold through many channels, communicating the correct prices correctly*** can be a challenge in itself. A number of pricing execution or ***"pricing***

management" vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that complex pricing changes are correctly and efficiently transmitted through all channels." EX1029 (Phillips), 31 ("we need to compare the results with our expectations and evaluate overall performance against our goal… Here, the ***effects of the most recent actions should be monitored so that immediate action can be taken if necessary***."; "***Price-response curves will be updated*** much more frequently, typically weekly or monthly in the case of markdown management or customized pricing."), Fig. 2.4 (p.27); *see also* EX1029 (Phillips), 32 ("As we discuss in Chapter 3, the corporate goal in a ***product/segment/channel combination determines the form of the objective function*** that will be ***used when optimizing*** that "cell" of the PRO cube."), 38-61 ("A fundamental input to any PRO analysis is the *price-response* function, or *price-response curve, d(p)* which specifies how demand for a product varies as a function of its price, *p.* There is ***one price-response function associated with each combination of product, market-segment, and channel.…*** The ***price-response function specifies demand for the product of a single seller as a function of the price*** offered by that seller."), 137-138 ("The range of costs…represents a channel-pricing opportunity …airlines and hotels can establish fare classes based on the channel of a booking request and determine whether or not to provide availability through that channel. Furthermore, it provides a tremendous economic incentive for

revenue management companies to ***steer demand as much as possible through lower-cost channels... Calculation of incremental costs*** for a particular booking request requires an activity-based incremental costing model…").

400. As discussed immediately below, POSITA would have found it obvious to implement Jacob using Phillips's teachings of automatically determining a performance indicator. In addition, Phillips discloses "booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not" and that "within a very short time (typically less than 200 milliseconds) the reservation system needs to send a message whether or not [a reservation] request can be accepted." *E.g.*, EX1029 (Phillips), 136. Phillips further discloses that demand forecasts are "based on ***current and recent bookings***," (*e.g.*, EX1029 (Phillips), 135), and "the effects of most recent actions should be monitored so that immediate action can be taken if necessary," *e.g.*, EX1029 (Phillips), 31. And Jacob discloses the importance of keeping "information fresh at the sales channels," "insur[ing] [sic] that each sales channel would always be working with the most up-to-date pricing, availability and other information," and that inventory management systems should "quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time." *E.g.*, EX1004 (Jacob), ¶[0005].

401. Thus, in my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement the inventory management and distribution system of Jacob (in the recited combinations) using Phillips's beneficial teachings of determining a performance indicator in real time, in the temporal sense, if this were, *arguendo*, required.** Determining a performance indicator in real time, in the temporal sense, using sale data corresponding to the at least one or more additional vendor computing devices (*i.e.*, sale data corresponding to time-dependent inventory sold by multiple clients of Jacob's system running, *e.g.*, the "RezTrip" application) would have beneficially increased the ability and speed of the resulting system to monitor and track accurately the overall performance of each of Jacob's sales channels, including total inventory available at each sales channel and prices of inventory available at each sales channel, thereby permitting the system to more rapidly take into account data regarding the overall market when analyzing "the information received from the sales channels" to determine a performance indicator for each sales channel used to determine whether prices can be adjusted to "maximize revenue" and whether/if a particular sales channel is in danger of running out of inventory or if prices of inventory allocated to sales channels should be adjusted. This would have furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and ensuring that "each sales channel would always be working with the

most up-to-date pricing, availability, and other information"/keeping "information fresh at the sales channels" by, *e.g.*, increasing the speed and efficiency of the system or user of the system in responding to changing market conditions by providing a "fresh" metric used to measure changing market conditions and based on which the system or user of the system could quickly and efficiently reallocate inventory or adjust prices. For POSITA it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1029 (Phillips) (discussing extremely rapid processing/transmission (*e.g.*, at 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer***

booking requests. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***."), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity.")).

402. As discussed in 1[pre], Jacob in view of Phillips (in the recited combinations) renders obvious carrying out all of Jacob's functions[27] (including, without limitation, determining a performance indicator) ***automatically/without human intervention*** (as Phillips describes). Further, making these determinations/comparisons ***by performing calculations*** (rather than, *e.g.*, relying on estimates or approximations) as to both prices and inventory would have

[27] Although I have not repeated this discussion, this applies as well to the additional steps claimed in, *e.g.*, cl.1[a]-[g] and 1[i]. *See* cl.1[pre]. Further, this applies to claims 2 and 3.

advantageously increased the system's ability to monitor and track accurately each channel's revenue and inventory status. This would, in turn, have permitted the system to better and more quickly analyze whether prices/allocations should be adjusted to "maximize revenue" and whether a particular sales channel is in danger of running out of inventory or is out of inventory, and to compare and determine accurately whether a particular channel is selling inventory better than other channels. This would have furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" by, *e.g.*, increasing the efficiency of the system in responding to changing market conditions by adjusting prices and/or reallocating inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of inventory. For POSITA it would have been routine to make such an implementation choice, and (particularly in light of these disclosures) clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.[28]

[28] POSITA's reasonable expectation of success here and for all of the obviousness arguments herein is further confirmed by this technology's predictability. As discussed (§V), POSITA would have been well aware of all the hardware and soft-

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403. To the extent it is argued further disclosure determining ***a performance indicator*** based on at least the sale data corresponding to one or more additional vendor computing devices is required, **this would have been obvious based on Jacob or Jacob-Phillips (in the recited combinations) in further view of Phillips (*see* cl.1[pre]-[g])**. For the reasons discussed in, *e.g.*, cl.1[pre], POSITA would have found it obvious to implement Jacob using Phillips's teachings of performing calculations (including, *e.g.*, price adjustments) automatically, and Phillips additionally discloses performing calculations on sale data (such as information from current and recent bookings) to obtain performance indicators for each channel, such

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ware used in the combinations discussed herein, and "[s]ophisticated revenue-management systems" that, *e.g.*, "apply an inventory-allocation algorithm to make the best allocation decisions" were well known in the art. *E.g.*, EX1026 (Choi), 2; EX1029 (Phillips), 101 (explaining that seller facing projected demand exceeding supply "could use a combination of allocations and price rises to manage the shortage"), 141 ("Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function. These departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms").

as current price-response functions, demand/changes in demand, and revenue measures like RASM).

404. In addition, in my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's combined inventory management and distribution system (in the recited combinations, and including Jacob's disclosures of "performing calculations automatically" as to "inventory") using Phillips's beneficial teachings of determining a performance indicator automatically** to the extent it is argued Jacob or Jacob in light of the other aspects of Phillips does not already disclose or render obvious doing so. Performing calculations automatically to determine a performance indicator would have advantageously yielded a persistent indicator and increased the ability and speed of the resulting system to monitor and track accurately—without user intervention—inventory status and availability at each sales channel, thereby permitting the system to more rapidly determine/analyze how quickly a particular sales channel is selling inventory and whether it is running out of inventory, and more quickly compare/determine whether a particular channel is selling inventory better than other channels or at a higher price than other sales channels. This would have furthered both Jacob's and Phillips's express goals (*see* cl.1[pre]), and for POSITA (particularly in light of these disclosures and other known, similar systems automatically performing calculations of performance

predictions) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1029 (Phillips), 134-35, 30, 126; EX1026 (Choi), 4 ("A reasonable proposition is that it is most beneficial for hotels to book reservations through the least-expensive channels, if there is sufficient demand via those channels. To manage revenue by distribution channel, revenue-management forecasting and optimization models must be revised to consider the relevant information.").

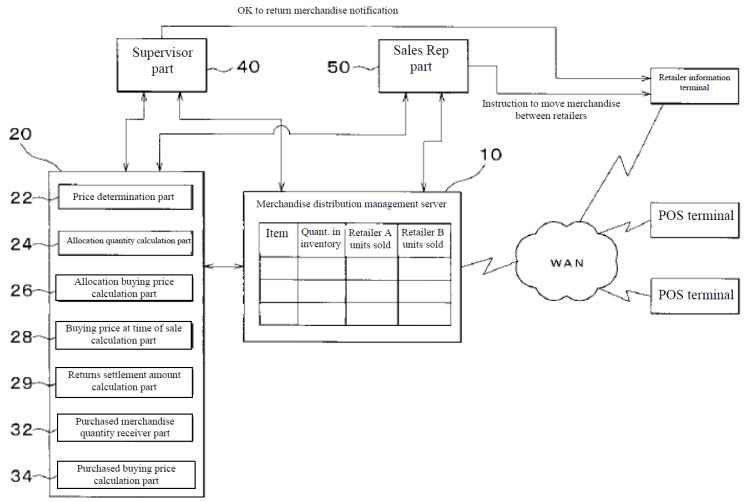
405. To the extent it is argued further disclosure of determining a performance indicator for each of the one or more participant channels based at least on the sale data corresponding to one or more additional vendor computing devices is required, **this would have been obvious based on Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura.**

406. **Tamura discloses determining** (*e.g.*, mathematically analyzing) **a performance indicator** (*e.g.*, parameter (*e.g.*, "sales progress rate for each retailer of the items") indicating, *e.g.*, retailer has "low sales progress rate," "high sales progress rate") **for each of the one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d]) **based on at least the sale data corresponding to one or more additional vendor computing devices** (*e.g.*, "sales progress rate" of "group of merchandise among retailers and

merchandise planning entities" with additional vendor computing device (*see* cl.1[a]) corresponding to additional "retailer" or additional "merchandise planning entities"; "with reference to the merchandise's distribution market")**.**

407. For example, Tamura discloses automatically determining a "sales progress rate" using the sale data (*e.g.*, number of units sold and allocated/allocation quantity, *see* cl.1[g]): "The sales management system of the invention, for example, as shown in Fig 2, preferably further comprises ***a sales rep part 50 that manages the sales progress rate for each retailer of the items among a predetermined number of retailers based on the allocation quantity***; and the sales rep part 50 is authorized to transfer the items from retailers having a ***low sales progress relative to the allocation quantity to retailers having a high sales progress rate***." *E.g.*, EX1005 (Tamura), ¶[0013]; Figs.2-3:

Fig. 3



408. In my opinion, POSITA would have understood that Tamura's "sales progress rate" is automatically obtained by the system mathematically analyzing Tamura's sale data (and is a "performance indicator"—*i.e.*, a "parameter" that is related to the performance of each retailer, such as a parameter "related to a surplus or deficit percentage related to supply and demand of particular inventory items," (*e.g.*, EX1001 ('047 patent), 6:46-49, 4:43-47, 6:25-33), because it relates to the relationship (*e.g.*, "relative") between demand for Tamura's inventory (*e.g.*, number of sales) and supply of that inventory (*e.g.*, allocation quantity)).

409. POSITA would have understood that Tamura discloses that its performance indicator is determined based on data from multiple vendors (and thus corresponding to at least one or more additional vendor computing devices. For example, Tamura discloses, "The sales rep part 50 ***manages the sales progress rate for each retailer with respect to the items between a predetermined number of retailers based on the allocation quantity***. The ***sales rep part 50 has the authority to transfer items from a retailer with a low sales progress rate in relation to the allocation quantity to retailers with a high sales progress rate***. A computer or information processing terminal connected to a communication line network may, for example be used. ***Sales reps (sales managers) who use the sales rep part 50 have a shared incentive to maximize sales within a group of merchandise among***

retailers and merchandise planning entities. For example, sales reps are assigned to a certain area by region, and if a certain product is not selling well at certain retailers within their area, they have the authority to transfer the merchandise to another retail store under their jurisdiction." *E.g.*, EX1005 (Tamura), ¶[0035]; *see also* EX1005 (Tamura), cl.4 ("The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the ***sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate***.").

410. Tamura further discloses that its performance indicator is determined "with reference to the merchandise's distribution market": "The price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the

manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and ***with reference to the merchandise's distribution market***." *E.g.*, EX1005 (Tamura), ¶[0019].

411. Both Jacob and Tamura describe inventory management systems using data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; *see also* cl.1[pre] (discussing Phillips). As discussed above, POSITA would have understood that Jacob discloses performing calculations as to both prices and inventory, and in any case, Jacob in view of Phillips (in the recited combinations) renders it obvious (*see supra* & 1[pre]). Tamura explicitly discloses receiving and processing sale data by carrying out calculations (which POSITA would have understood to be mathematically analyzing Tamura's sale data) to determine a performance indicator. *E.g.*, EX1005 (Tamura), ¶¶[0013], [0035], cls.4-5, Figs.2-3. For example, Tamura discloses "recording the inventory and the number of units sold during the unit period for each item of merchandise for sale," (EX1005 (Tamura), ¶¶[0014], [0017],

[0019], [0024], [0025] cl.5, Fig.2) and automatically carrying out calculations (*e.g.*, comparing "number of units sold to allocated quantity" (*e.g.*, "based on the allocated quantity")) to determine a performance indicator (*e.g.*, indicating "low sales progress rate," "high sales progress rate). *E.g.*, EX1005 (Tamura), ¶¶[0013], [0035], cl.4.

412. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's or Jacob-Phillips's combined inventory management and distribution system (in the recited combinations, and including Jacob's disclosures of "performing calculations automatically" as to "inventory") using Tamura's beneficial teachings of processing sale data by automatically carrying out calculations to determine a performance indicator** to the extent it is argued Jacob or Jacob-Phillips does not already disclose or render obvious doing so. Performing calculations automatically to determine a performance indicator (*e.g.*, "progress rate") would have advantageously yielded a persistent indicator and increased the ability and speed of the resulting system to monitor and track accurately—without user intervention—inventory status and availability at each sales channel (including across multiple products sold by different vendors (*e.g.*, additional "merchandise planning entities") within each channel, thus enabling updating of pricing information and/or inventory allocations based on the overall market rather than the market for a single vendor's inventory items), thereby permitting the system to more

rapidly determine/analyze how quickly a particular sales channel is selling inventory and whether it is running out of inventory, and more quickly compare/determine whether a particular channel is selling inventory better than other channels or at a higher price than other sales channels. This would have furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, increasing the efficiency of the system in responding quickly to changing market conditions by providing a metric used to measure changing market conditions and based on which the system could quickly and efficiently reallocate inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of inventory or to channels that are selling inventory at higher prices and change prices. *See also* cl.1[pre] (discussing Phillips's express goals). For POSITA (particularly in light of these disclosures and other known, similar systems automatically performing calculations of performance predictions) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1029 (Phillips), 134-35, 30, 126; EX1026 (Choi), 4 ("A reasonable proposition is that it is most beneficial for hotels to book reservations through the least-expensive channels, if there is sufficient demand via those channels. To manage revenue by distribution channel, revenue-management

forecasting and optimization models must be revised to consider the relevant information.").

413. Thus, in my opinion, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura renders this limitation obvious.

414. Alternatively, to the extent it is argued still further disclosure of processing the sale data by carrying out calculations to determine a performance indicator (including automatically/without human intervention) is required, **this would have been obvious over Jacob or Jacob-Phillips (in the recited combinations) in view of Kono**.

415. **Kono discloses determining** (*e.g.*, "perform[ing] a sales analysis at each agency"; *see* cl.1[g]) **a performance indicator** (*e.g.*, "result" of "sales analysis at each agency") **for each of the one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d])**.**

416. For example, Kono discloses that its "manufacturer server device" "performs sales analyses at each agency" using the sale data (*see* cl.1[g]), including the "acquired product shipment of each agency": "According to the present invention having such characteristics, by connecting the manufacturer server device and the terminals of each agency by a direct network, the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each

agency in real time. ***The manufacturer server device estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and monthly sales index data of the product, and performs sales analyses at each agency.*** Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, ***transfer (resale, etc.) of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed***." *E.g.*, EX1007 (Kono), ¶[0010]; *see also* EX1007 (Kono), ¶[0014] ("According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network, can acquire product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time. ***The maker estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and sales index of the product, and performs sales analyses at each agency.*** Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, ***resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed***.").

417. POSITA would have understood that the "result" of Kono's sales analysis at each agency (which analyzes Kono's acquired sales data) is a "performance indicator"—*i.e.*, a "parameter" that is related to the performance of each agency, such as a parameter "related to a surplus or deficit percentage related to supply and demand of particular inventory items," (*e.g.*, EX1001 ('047 patent), 6:46-49, 4:43-47, 6:25-33), because it relates to the relationship between demand for Kono's inventory (*e.g.*, acquired product shipment information of each agency, "demand forecast of the overall market for the product and sales trends by region are analyzed") and supply of that inventory (*e.g.*, "product inventory information").

418. Kono further discloses an "analysis means" that, among other things, "performs a sales analysis at each agency": "Moreover, the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like. Moreover, the market inventory control computer 22 is provided with: acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency from each agency terminal 1a, 1b, 1c, ...; ***analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency***; and ***transfer instruction means for, as a result of the sales analysis, for the product whose sales***

on the market have fallen, instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instructing transfer between warehouses." *E.g.*, EX1007 (Kono), ¶[0025]; *see also* EX1007 (Kono), ¶[0009] ("[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, ***the manufacturer server device is provided with***: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; ***analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency***; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses. Moreover, the above configuration is further provided with: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores

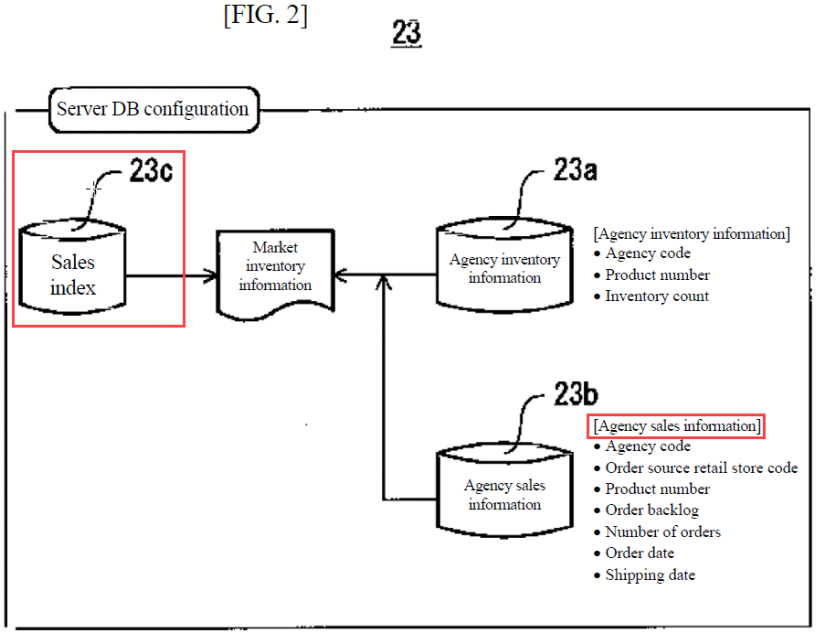
sales index data for each product; wherein the analysis means, based on the product shipment information and the ***sales index of each agency stored in the agency shipment information database*** and the sales index database, estimate the sales volume of the product on the overall market and ***performs a sales analysis at each agency***."), [0050] ("In other words, the maker side does not receive returned products, and only a return fee is sufficient, and therefore costs are reduced, and wasteful production may be avoided. Moreover, on the agency "ffff" side, bad inventory can be accounted for. Inventory on the market can be controlled and effectively utilized in such a manner that at the agency "bbbb," necessary amounts can be secured and sales can be continuously secured as well. Moreover, because this ***type of information is periodically updated (daily)***, the inventory on the overall market can be always known, and it is possible to rapidly respond to this type of situation (***excess inventory and inventory shortage on the agency side***)."), cl.1 ("A market inventory control system in which an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, wherein the manufacturer server device comprises: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; analysis means that estimate sales volume of the product on the

overall market and ***performs a sales analysis at each agency; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instruct transfer between warehouses."), cl.2 ("The market inventory control system according to claim 1, further comprising: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and ***the sales index of each agency stored in the agency shipment information database and the sales index database***, estimate the sales volume of the product on the overall market and performs a sales analysis at each agency.").

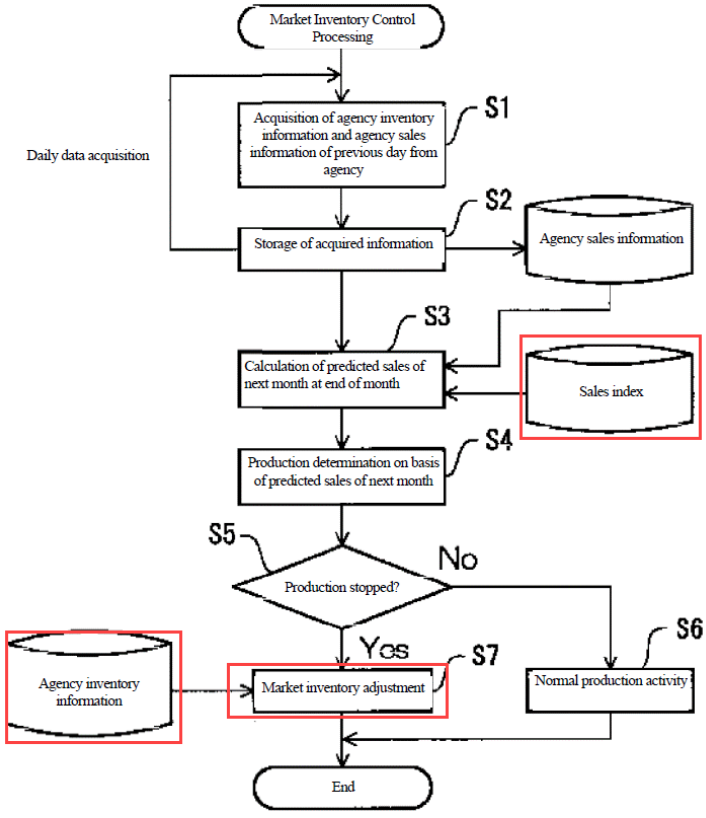
419. **Kono additionally discloses that the above-discussed determining is based on sale data corresponding to the one or more active channel records.** For example, Kono discloses "FIG. 2 illustrates an example of various databases controlled by the database server 23. Three kinds of databases controlled by the database server 23 are prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index

database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the agency sales information database 23b. Moreover, ***monthly sales indexes of the previous year and current year are saved in the sales index database 23c***. In the database server 23, ***these data are updated daily*** so that ***the data can be stored and analyzed***. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software." *E.g.*, EX1007 (Kono), ¶[0026]; *see also* EX1007 (Kono), ¶[0030] ("Moreover, the monthly sales index is calculated as follows. That is, when the sales weight of all products included in the category to which the product belongs in the previous fiscal year (for example, the categories of bathroom supplies, kitchen supplies, buckets, cleaning supplies, ...)—for example, if the product belongs to the category of cleaning supplies, the sales weight of all products belonging to cleaning supplies from the agency to the retail store in the previous fiscal year—is as shown in Table 1 below, the monthly average sales weight is then 1,633 kg, and the value obtained by dividing the monthly results by the monthly average sales weight (average value) is the monthly sales index."), Fig.2 (showing stored information, including "Agency sales information" and "Sales index"), Fig.3:

[FIG. 2]


23
Server DB configuration
23c
Sales index
Market inventory information
23a
Agency inventory information
[Agency inventory information]
• Agency code
• Product number
• Inventory count
23b
[Agency sales information]
Agency sales information
• Agency code
• Order source retail store code
• Product number
• Order backlog
• Number of orders
• Order date
• Shipping date

[FIG. 3]


Market Inventory Control Processing
Daily data acquisition
Acquisition of agency inventory information and agency sales information of previous day from agency
S1
Storage of acquired information
S2
Agency sales information
Calculation of predicted sales of next month at end of month
S3
Sales index
Production determination on basis of predicted sales of next month
S4
Production stopped?
S5
No
Yes
Agency inventory information
Market inventory adjustment
S7
Normal production activity
S6
End

420. As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"); *see also* cl.1[pre] (discussing Phillips). As discussed above, Jacob further discloses "performing calculations automatically" as to "prices" (*e.g.*, EX1004 (Jacob), ¶¶[0131]-[0133]), and POSITA would have understood from these disclosures that Jacob also discloses automatically performing calculations as to "inventory," and in any case, Jacob in view of Phillips (in the recited combinations) renders it obvious (*see supra* & 1[pre]). Kono expressly discloses receiving sale data from each distribution channel (*e.g.*, EX1007 (Kono), ¶¶[0009], [0010], [0014]), and automatically processing the received sale data by carrying out calculations (*e.g.*, "sales analysis at each agency," *e.g.*, EX1007 (Kono), ¶¶[0009], [0010], [0014], [0025], cl.1) to determine a performance indicator (*e.g.*, "result" of the "sales analysis at each agency," *e.g.*, EX1007 (Kono), ¶¶[0010], [0014], [0025], cl.1).

421. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's or Jacob-**

Phillips's combined inventory management and distribution system (in the recited combinations, including Jacob's disclosures of "performing calculations automatically" as to "inventory") using Kono's beneficial teachings of processing sale data by automatically carrying out calculations to determine a performance indicator to the extent it is argued Jacob or Jacob-Phillips does not already disclose or render obvious doing so. Performing calculations automatically to determine a performance indicator (*i.e.*, "result" of "sales analysis at each agency") would have advantageously yielded a persistent indicator and increased the ability and speed of the resulting system to monitor and track accurately—without user intervention—inventory status and availability at each sales channel, thereby permitting the system to more rapidly determine/analyze how quickly a particular sales channel is selling inventory and whether it is running out of inventory, and more quickly compare/determine whether a particular channel is selling inventory better than other channels. This would have furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" and reducing "unnecessary inventory on the market" by, *e.g.*, increasing the efficiency of the system in responding quickly to changing market conditions by providing a metric used to measure changing market conditions and based on which the system could quickly and efficiently reallocate

inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of inventory and change prices. *See also* cl.1[pre] (discussing Phillips's goals). For POSITA (particularly in light of these disclosures and other known, similar systems automatically performing calculations of performance predictions) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See, e.g.*, EX1029 (Phillips), 134-35, 30, 126; EX1026 (Choi), 4 ("A reasonable proposition is that it is most beneficial for hotels to book reservations through the least-expensive channels, if there is sufficient demand via those channels. To manage revenue by distribution channel, revenue-management forecasting and optimization models must be revised to consider the relevant information.").

422. Thus, in my opinion, Jacob or Jacob-Phillips (in the recited combinations) in view of Kono renders this limitation obvious.

j. Element 1[i]

423. Claim 1[i] recites **"and for each of the one or more participant channels corresponding to the one or more active channel records linked to the**

channel interface, adjusting,[29] via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold." In my opinion, Jacob (in the recited combinations) discloses or renders obvious this limitation. Alternatively, in my opinion, Jacob (in the recited combinations) in view of Phillips, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura, and Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura and Kono, renders obvious this limitation.

424. In my opinion, **Jacob discloses for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[c]-[d], [f])**, adjusting** (*e.g.*, "close the Rate

[29] The '047 patent does not require that steps such as "adjusting" be performed "automatically" or without any human intervention. Rather, '047 expressly contemplates user input to its system. EX1001 ('047 patent), 5:11-14, 30:59-31:3 ("interface used by vendor"), 31:54-60 ("interface to permit the Property to lock inventory"). To the extent "adjusting" "automatically" without any human intervention is required, as discussed below, Jacob discloses or Jacob-Phillips (*see* cl.1[pre]) renders obvious this limitation or Jacob or Jacob-Phillips in view of Tamura renders obvious this limitation. *See also* cl.1[h].

Type… for a given date or a series of dates, for certain channels"; "adj\usting prices in response to changes in room inventory"; "price of an unreserved room may be lowered"), **via the channel interface** (*see* cl.1[a]), **a price of the transportation service** (*e.g.*, "Rate Type… for a given date or a series of dates"; "price"; "selling rate" of inventory related to "the vendor computing device" (*see* cl.1[a])) **by an adjustment factor** (*e.g.*, "discounted rates"; "special discounts"; "[p]romotional discounts"; "promotion rate"; "promotion Rate Type"; "absolute dollar amount"; "percentage off the rate for that Room Type"; "dollar amount off the rate for that Room Type") **if the performance indicator** (*see* cl.1[h]) **indicates a performance that fails to meet a performance threshold** (*e.g.*, performance comprising "unreserved room"; "vacant" room; "day within the Rate Type active period is" not "selling [as] quickly" as "other days in the period" as to inventory related to the "at least one or more additional vendor computing devices" (*see* cl.1[g])).

425. For example, Jacob expressly discloses performing a price adjustment by closing a "Rate Type" (*e.g.*, a discounted rate such as an "AAA® Rate" or a "corporate rate"), thus increase the price of sold on a particular sales channel: "***If a sales channel's Room Type inventory*** *is sold out or* ***is selling better than other channels***, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to ***close the Rate Type***/Room Type, for a given date or a series of dates, ***for certain channels***." *E.g.*, EX1004 (Jacob), ¶[0180].

426. Jacob also expressly discloses performing price adjustments if, *e.g.*, a particular day is selling more quickly than other days: "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." *E.g.*, EX1004 (Jacob), ¶[0176].

427. In addition, Jacob discloses the importance of communicating this updated pricing information to its sales channels: "The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" *E.g.*, EX1004 (Jacob), ¶[0185].

428. Jacob also discloses: "***A method of managing hotel pricing and inventory information comprising***: providing a database configured to manage hotel data; providing a first code segment configured to manage hotel data; providing a second code segment configured to manage user interaction; interacting with the

code segments by: (a) entering portal data; (b) entering property data; (c) entering room type data; (d) entering room hierarchy data; (e) entering rate type data; (f) entering date data; (g) communicating pricing and inventory information to a plurality of sales channels. ***(h) monitoring room inventory***; ***(i) adjusting prices in response to changes in room inventory***; (j) adjusting prices in response to date changes; ***(k) communicating pricing and inventory information to a plurality of sales channels***; (l) repeating steps (i) through (l) on a regular schedule." *E.g.*, EX1004 (Jacob), cl.13.

429. And, while Jacob discloses that a user of the system can decide to perform such a pricing adjustment (and instruct the system, including the computing device of the system, to perform the adjustment by storing updated pricing information/data and communication such information/data to sales channels), Jacob also discloses that its system comprises computer programs that are configured to "perform the methods/functions of the invention." For example: "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code

segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels**.** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input

from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082]; *see also* EX1004 (Jacob), ¶[0083] ("***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk."), [0078] ("As used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which manage data do so through their associated functions.").

430. As discussed below, POSITA would have thus understood that in addition to Jacob's users instructing the computing device to adjust inventory pricing, such adjusting can be performed automatically by Jacob's system (in the recited combinations) without user intervention. Indeed, Jacob discloses the

importance of a system that allows property administrators to "respond quickly to the dynamic nature of the marketplace, pricing and repricing inventory as necessary based upon changes in availability… with a minimum of data entry by the staff" and that an inventory management system should ensure that "sales channels would always be working with the most up-to-date pricing, availability, and other information." *E.g.*, EX1004 (Jacob), ¶[0005].

431. Consistent with this, Jacob discloses that the code segments of its system "perform calculations automatically" and "may be configured to automatically communicate" information to Jacob's sales channels. For example, Jacob discloses "Calculate the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." *E.g.*, EX1004 (Jacob), ¶[0131]; *see also* EX1004 (Jacob), ¶[0132] ("Automatically recalculate prices for associated Room Types in response to changes in the BAR rate. The ***code segment may be configured to perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click.").

432. Jacob discloses that its "computer program systems" include "code segments" such as "an analysis code segment, [and] a revenue enhancement code segment." For example: "***Embodiments of the present invention are computer***

program systems comprised of a series of code segments. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" *E.g.*, EX1004 (Jacob), ¶[0006].

433. Jacob also discloses that, *e.g.*, its communications code segments "communicate," *inter alia*, updated inventory and pricing information to sales channels. For example, "The communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions. ***Once the Rate Types, Room Types, and inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels.*** Other information communicated to the selling channels may

comprise add-on information, package information, amenity information, and facility information. ***The information is communicated to the selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click.*** As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such as the internet*** or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form." *E.g.*, EX1004 (Jacob), ¶[0191]; *see also* EX1004 (Jacob), ¶[0133] ("Communicate the prices to a plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or communicate in response to a user initiated triggering event***, such as a mouse click.").

434. Jacob further discloses "The system of claim 5 further comprising a code segment to ***automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***." *E.g.*, EX1004 (Jacob), cl.6; *see also* EX1004 (Jacob), cl.5 ("The system of claim 1

further comprising a code segment configured to ***communicate pricing information and inventory information to a plurality of sales channels***."), Figs.5-6 showing examples of "constraints" linking different room rates across room types and automatic cascading of updates to all rate types), Fig.7 (showing communication of "Rates & Availability" to each individual selling channel by, *e.g.*, Jacob's "RezTrip Application"), Fig.40 (showing "Change Allotment" function as to Rate Types in RezTrip application), Figs.41-43:

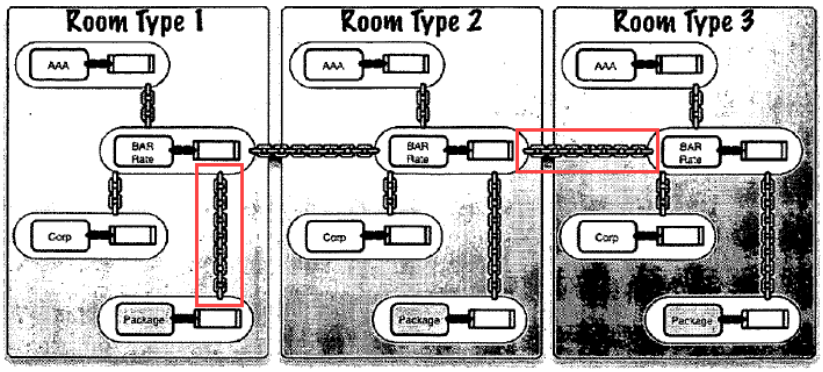


Figure 5

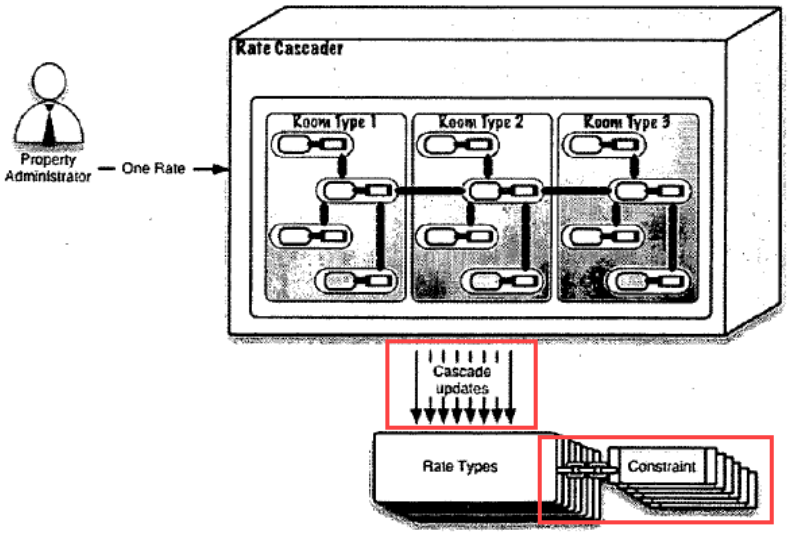


Figure 6

EX1004 (Jacob), Fig.6.

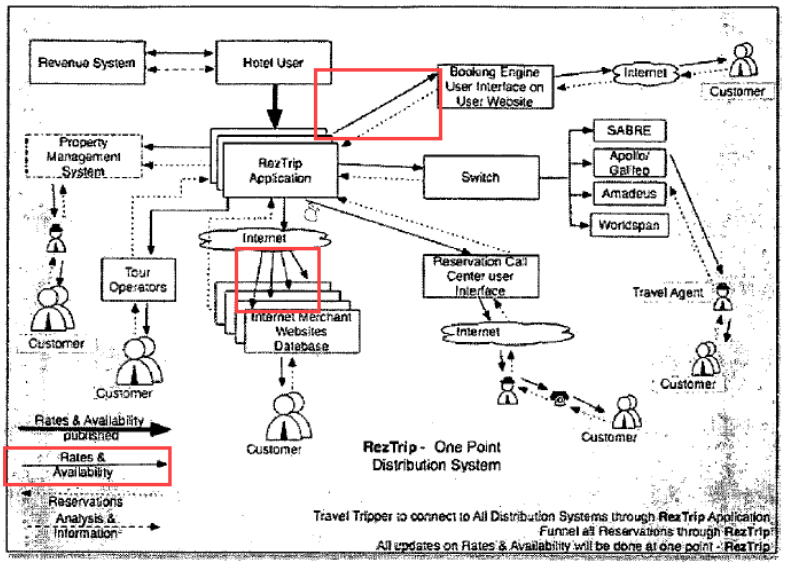


Figure 7

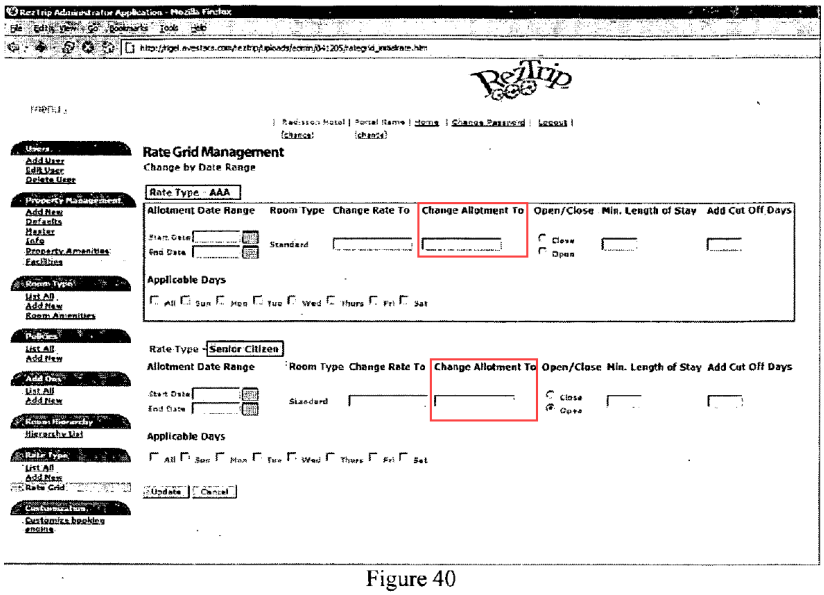


Figure 40

435. **Jacob further discloses adjusting price by an adjustment factor if a performance indicator indicates that a performance fails to meet a performance threshold.** For example, Jacob discloses "Promotion Rates" used to "improve the revenue stream of the property: "***The Promotion Rate is a Rate Type a Property might create and offer for sale to improve the revenue stream of the property.*** These Rate Types can be set up with restrictions, for example, minimum length of stay and valid only on certain days of week. The promotion Rate Type can be set up to be available permanently or within a specific time frame. The Rate Type can use absolute dollar amounts for room prices or the prices can be floating based upon the BAR rate. This Rate Type will use the inventory that is associated with the BAR. Therefore, if the BAR for standard rooms has 100 rooms, and if 20 rooms are sold at BAR rate, then 80 rooms remain available to be sold at the BAR rate and at

any of the promotional rates that are available for the dates." *E.g.*, EX1004 (Jacob), ¶[0152]; *see also* EX1004 (Jacob), ¶[0153] ("***The Promotion Rate with inventory allows the Property to sell only a portion of the rooms at the promotional rate.*** In this case the promotional Rate Type will have its own inventory. If for example, a "Winter Promotion Rate Type" is given an inventory of 20 rooms for the dates December 1 through December 20, any room sold with this Rate Type will not affect the BAR inventory and vice versa."), [0121] ("Promotional discounts from direct mail, website, or email campaigns.").

436. Jacob further discloses that its promotion rates may be used, for example, during "low booking seasons": "The package creation code segment is configured to manage package creation data and package creation functions. Embodiments of the invention provide a way for the PA to create packages/specials/items that can be offered to Eus during the reservation workflow. For example, a Property may have discounted rates. These discounted rates are usually offered during low booking seasons to maintain occupancy levels. The following types of promotions are configurable by the embodiments of the invention:" *E.g.*, EX1004 (Jacob), ¶[0224].

437. Jacob additional discloses that its promotional rates include prespecified discounts, including a "percentage off the rate for that Room Type": "Fixed Rate Promotions: $ per night for a specific room type for a given set of

dates."; "Floating Value Promotions: These can be of three types."; "A percentage off the rate for that Room Type."; "A dollar amount off the rate for that Room Type." *E.g.*, EX1004 (Jacob), ¶¶[0225]-[0228].

438. Jacob further discloses that "Each Room Type within the system will be entered with a default selling rate along with the inventory for each calendar date. However, the same rate may not be offered to everyone. In certain instances a discount may be offered to a group of EUs. Therefore, the code segment provides functionality to associate various Rate Types with each Room Type for a given date. For example, the rate for a standard room across a series of dates could be as follows:"

	Standard Room-		
Rate Type	04/11/05	04/12/05	04/13/05
Default Rate	$139	$159	$199
AAA ™ Rate	$126	$144	$180
Government Rate	$130	$150	$190
Summer Package Rate	$100	$100	$100

E.g., EX1004 (Jacob), ¶[0123]; *see also* EX1004 (Jacob), ¶[0124].

439. Jacob also discloses that its system provides "special discounts": "The system comprises a pricing code segment configured to allow the property administrators to manage room pricing information. The pricing code segment comprises the pricing functions. The prior art pricing change process is illustrated in FIG. 4. A property administrator wishing to change rates for rooms must manage

each room type, rate type, date, and constraint type combination individually. As the number of room types, rate types, dates, and constraints grow, the task of changing and/or managing the information grows geometrically. As illustrated in FIG. 5, embodiments of the invention define a matrix of relationships between room types, rate types, and room constraints. The pricing code segment functions by basing room prices upon the price of a standard room offered at the best available rate (BAR). For example, a standard single occupancy room may be offered at a particular BAR. The hotel user then enters the rates of the other rooms as a function of the BAR. Double occupancy may command a rate of BAR plus an extra person charge, triple occupancy may command a rate of BAR plus 2 times the extra person charge. A deluxe room may be priced at 15% above BAR, or $50 above BAR, or some other figure based upon BAR. Prices based upon combinations of room type, occupancy, ***special discounts***, group discounts, and preferred client pricing may be set. Once the matrix of the dependencies upon the BAR are set, the system can calculate the prices of the available rooms. The matrix of BAR dependencies needs only to be set once. Subsequent room pricing changes may be implemented by changing only BAR. The rest of the room prices and rates can be calculated automatically based upon the matrix of BAR dependencies. Individual room prices may be set manually, overriding prices calculated by the matrix of BAR dependencies. Once pricing changes have been implemented the results may be distributed through the

communication code segment or code segments to the sales channels. By defining a matrix of relationships or hierarchies between room types, rate types, and constraints, embodiments of the invention allow PA's to modify one rate, for example the BAR rate of a standard room type, and have other rates (floating rates) automatically changed as illustrated in FIG. 6." *E.g.*, EX1004 (Jacob), ¶[0008].

440. As Jacob expressly discloses, POSITA would have understood pricing and inventory information sent to Jacob's sales channels as a result of, *e.g.*, an automatically initiated triggering event (initiated by the system), to include ***updated*** pricing and inventory information that has been adjusted or modified as part of Jacob's expressly disclosed "rate management process" (by *e.g.*, Jacob's users, or Jacob's code segments, such as Jacob's revenue management, analysis, and revenue enhancement code segments). *E.g.*, EX1004 (Jacob), ¶[0185]. Jacob also discloses "computer program systems configured to manage the data and perform the methods/functions of the invention," including "code segments… configured to manage hotel data, and other time-dependent inventory data." *E.g.*, EX1004 (Jacob), ¶[0082]. Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose computers." *E.g.*, EX1004 (Jacob), ¶¶[0082], [0083]. Additionally, Jacob discloses (in addition to the possibility of a human administrator providing input (*e.g.*,

EX1004 (Jacob), ¶[0180])) that "information is communicated to the selling channels in response to a triggering event. A triggering event may [be] initiated ***automatically*** by the system upon completion of a pricing update" (*e.g.*, EX1004 (Jacob), ¶[0191]), and "a code segment to ***automatically*** communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event" (EX1004 (Jacob), cl.6). *See also* EX1004 (Jacob), ¶¶[0131]-[0133] ("code segment may be configured to ***automatically*** communicate the prices and/or communicate in response to a user initiated triggering event"), cl.31; cl.1[pre]. Jacob further discloses an "analysis code segment" and a "revenue enhancement code segment," (*e.g.*, EX1004 (Jacob), ¶[0006]), and a "revenue management code segment used to analyze the information received from the sales channels… to maximize hotel revenue," *e.g.*, EX1004 (Jacob), ¶[0010].

441. In my opinion, **POSITA would have understood these disclosures to be an express disclosure—as an alternative to actions triggered by human input—of automatically "adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold"** (*e.g.*, "unreserved" or "vacant" room(s), a "day within the Rate Type period is" not "selling [as] quickly" as "other days in the period," or a sale's channel's inventory is not selling as well as that of other sales channels (*see* cl.1[g])) and communicating

such adjustments to both the system's clients (*e.g.*, Properties) to beneficially make clients aware of such adjustment as well as to the sales channels.

442. Further, if it is argued further disclosure is required, as discussed in 1[pre], Jacob in view of Phillips (in the recited combinations) renders obvious carrying out all of Jacob's functions[30] (including, without limitation, adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold) ***automatically/without human intervention*** (as Phillips describes).

443. Additionally, POSITA would have further understood that Jacob provides examples of multiple sales channels, but that Jacob's disclosures would have applied to systems with two or more sales channels. And to POSITA, it would have been obvious from their understanding of basic economics (and optimization of net revenue) to upwardly "adjust" (*i.e.*, raise) a price or prices of items allocated to one or more distribution channels while also downwardly "adjusting" (*i.e.*, lowering) a price or prices of items allocated to one or more other distribution channels (known as "price differentiation") based on a performance indicator indicating a performance of a participant channel fails to meet a performance

[30] *See* n.27, *supra*.

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threshold. *See, e.g.*, EX1029 (Phillips), 1 ("Price differentiation is a ***powerful way for sellers to improve profitability***"), 74 ("The term price discrimination is used in the economics literature to refer to much the same thing. We use the term price differentiation"), 76 ("Charging every customer exactly her willingness to pay is known as third-degree price discrimination in the economics literature"), 6 ("Channel pricing is the practice of selling the same product for different prices through different distribution channels"), 15 ("Tactics for price differentiation include … ***channel pricing***…."), 26 ("The ***goal of pricing and revenue optimization is to provide the right price • for every product*** • to every customer segment • ***through every channel and to update those prices over time in response to changing market conditions***"), 74 ("price differentiation" is "one of the most fundamental concepts in PRO [pricing and revenue optimization]"), 78 ("***sellers have a tremendous incentive to find creative ways to position and price their products differently*** to different market segments"), 99 ("the tactic of ***variable pricing*** ... ***is used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***."), 101 ("the ***seller could use a combination of allocations and price rises*** to manage the shortage"), 136-37 ("expected net contribution… is the price (fare) minus the incremental cost," which "may vary by channel"). This would have beneficially increased the ability of the resulting system to respond more fulsomely to changing market conditions by

adjusting prices of items allocated to different channels in different directions (*i.e.*, one (or more) upwardly and one (or more) downwardly) (by, *e.g.*, communicating such pricing updates both to the system's clients and to sales channels), again increasing the system's ability to respond, thereby furthering Jacob's express goal of "maximiz[ing] revenue." For POSITA it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.[31]

[31] POSITA's reasonable expectation of success here and for all of the obviousness arguments herein is further confirmed by this technology's predictability. As discussed in §V, POSITA would have been well aware of all the hardware and software used in the combinations discussed herein, and adjusting a price of items allocated to distribution channels automatically based on sale data was well-known in the art. *E.g.*, EX1011 (Walker), 5:34-37 ("dynamically determine, adjust and manage product pricing"); EX1015 (Veit), 2:15-22 ("adjusting the initial price… based on the actual sales of the product"); EX1029 (Phillips), 126 ("At the heart of these [existing reservation] systems [by which "airlines and other travel companies manage their inventory"] are the booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not"), 30 ("In

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very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations."), 141 ("Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function. These departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms"), 101 (explaining that seller facing projected demand exceeding supply "could use a combination of allocations and price rises to manage the shortage"; "if he has segmented his market effectively, he could raise his average selling price by allocating most or all of the limited supply to higher-paying customers"), 80 (explaining "that customers arriving via different channels have different price sensitivities… Thus differential willingness to pay is also a motivation for channel pricing"); EX1026 (Choi), 2 ("One offers discounted rates to stimulate demand for inventory that would otherwise go unsold, but limits the availability of discounts to customers who are willing to pay a higher price…."; "Sophisticated revenue-management systems apply an inventory-allocation algorithm to make the best allocation decisions, which are then communicated to users in the form of restrictions on each rate-bucket level. Allocation decisions are typically updated nightly for the next 90 arrival days through a

444. **Phillips discloses automatically/without the need for human intervention (***see* cl.1[pre]) **adjusting the price of an inventory item up or down** (*e.g.*, "*forecasting module* generates and updates for all products/fare class combinations", "prices will be updated automatically," "periodically updat[ing] the prices and/or availabilities [seller] is offering," "[p]eriodically recalculat[ing] all booking limits based on total bookings and demand expected in each class," "revenue management [system]… to calculate and… update the booking limits")**.**

445. For example, Phillips discloses: "In very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations." *E.g.*, EX1029 (Phillips), at 30; *see also* EX1029 (Phillips), 106-107 ("a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity"), 31 ("A number of pricing execution or 'pricing management' vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that complex pricing changes are correctly and efficiently transmitted through all channels"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE and

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rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions.").

Worldspan.[] Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines").

446. Phillips further discloses that revenue management systems adjust prices "moment by moment": "[A]t the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***." *E.g.*, EX1029 (Phillips), 126; *see also* EX1029 (Phillips), 131 ("The job of ***tactical revenue management*** is to ***calculate and periodically update booking limits***. These booking limits are transmitted to the reservation system, which then uses them to determine which booking requests to accept and which to reject based on the logic described in Section 6.5. To introduce the tactical revenue management problem in its most general form, it is useful to define resources, products, and fare classes. • Resources are units of capacity managed by a supplier. Examples of resources are a flight departure, a hotel room night, and a rental car day. Each resource is constrained—the flight departure has a limited number of seats, the hotel only has a limited number of rooms it can sell, and a rental car company has only so many cars it can rent out on a particular day. • Products are what customers seek to purchase. A product may require use of one or

more resources. A seat on Flight 130 from St. Louis to Cleveland on Monday, June 30, is a product that uses only a single resource. A two-night stay at the Sheraton Cleveland for a customer arriving on March 19 and departing on March 19 is a product that uses two resources: a room night on March 19 and a room night on March 20. There are one or more ***fare classes*** associated with each product. ***Each fare class is a combination of a price and a set of restrictions on who can purchase*** the product and when. As discussed in Section 6.3, different fare classes can be used to establish different virtual products, for group pricing, for regional pricing, or for combinations of all of these."), 123 ("For ***airlines, hotels, rental car companies, and cruise lines, booking control is a function of the reservation system. Tactical revenue management is the "brains"*** of the process. It is where ***future demand is forecast, optimization algorithms run, and booking limits set and updated***. We first discuss the strategy of revenue management and how it applies in different industries. We then turn to a somewhat detailed discussion of ***booking control—the "real-time" face of revenue management***."; "Once products and prices have been established, **revenue management tactics require setting and updating limits on how much of a particular product can be sold at a particular fare to each segment for some period of time**—say, a day or a week. ***Booking control*** **is the moment-to-moment determination of which booking requests should be accepted and which should be rejected**." (italics in this last quote are original)),

447. Phillips also expressly discloses setting different prices for the same product on different distribution channels: "4.3.2 Channel Pricing[:] ***Channel pricing is the practice of selling the same product for different prices through different distribution channels***. Here are some examples. • Barnes and Noble sells books for different prices online than through its outlets. • Special "Web-only" fares for airline tickets are available through the Internet but not through travel agencies. • Many fashion and home furnishing merchants offer lower prices for merchandise through mail-order catalogs than for the same merchandise sold through retail outlets. [¶] As with other price differentiation schemes, there can be more than one reason why a seller might charge different prices through different channels. One is cost—for many companies, selling through the Internet is cheaper than selling through traditional channels. Continental Airlines calculated that distribution costs for a $325 ticket are about $43 when the ticket is sold through a travel agent versus only $18 when the same ticket is sold through Continental's Web site. This difference in itself would be sufficient reason for Continental to charge lower prices on its Web site." *E.g.*, EX1029 (Phillips), 79; *see also* EX1029 (Phillips), 99 ("the tactic of ***variable pricing***… is ***used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***."), 120 ("Channel pricing is the practice of selling the same product for

different prices through different distribution channels…. Thus differential willingness to pay is also a motivation for channel pricing.").

448. Phillips further discloses, "However, it is also the case that ***customers arriving via different channels have different price sensitivities***. For personal loans, it has been shown that *customers inquiring through the Internet* are more price sensitive than those contacting a call center, who are in turn more price sensitive than those who apply for a loan at a retail branch. Furthermore, ***Internet customers who access a consolidator Web site or use a shopping 'bot tend to be more price sensitive than those who go directly to a bank's Web site***. This is not surprising given the characteristics of the channels—it is generally easier and more convenient to shop and compare prices during a single Internet session than by making many phone calls. Thus differential willingness to pay is also a motivation for channel pricing." *E.g.*, EX1029 (Phillips), 80; *see also* EX1029 (Phillips), 120 ("the techniques can be ***applied to any situation in which a seller needs to determine how to allocate a fixed supply among different channels or customer segments paying different prices***").

449. Phillips further explains: "***Passenger airlines*** certainly meet the criteria for ***variable pricing***—constrained capacity with demand that fluctuates over time. ***Southwest Airlines implements variable pricing directly by changing fares for their departures in order to match demand with the restricted capacity***. However,

the major "***nondiscount" airlines also practice variable pricing. They do so by opening and closing the availability of various fare classes on different flights***.… In this case, the airline is adjusting the average fare not by changing the list price but by opening and closing fare classes. When total demand is anticipated to be high, the airline will restrict availability of discount fares, causing the average fare to increase. When total demand is anticipated to be low, the airline will open availability of deep discounts, causing the average fare to drop. It is continually monitoring demand using its revenue management system to determine which classes to open and close on each flight. We describe how this is done in some detail in Chapters 6 and 7. [¶] Discount airlines use variable pricing even more directly. ***If demand at Southwest Airlines begins to rise more quickly or more slowly than anticipated, Southwest may change the price***. Southwest does not attempt to use prices to segment customers between "high-elasticity" and "low-elasticity" segments—rather, it is using variable pricing without segmentation to maximize the return from each flight and, to some extent, to smooth demand through demand diversion from high-fare/high-utilization flights to low-fare/low-utilization flights." *E.g.*, EX1029 (Phillips), 112-113; *see also* EX1029 (Phillips) 134-135 ("The *forecasting module* generates and updates for all products/fare class combinations for all future dates… These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general***

demand trends for all flights"), 124 ("***Airlines are also enthusiastic channel pricers***; ticket prices on the Internet are often cheaper than through travel agents. Other revenue management companies followed the airlines in segmenting their market, creating virtual products and establishing a wide range of prices. ***Hotels and rental car companies*** establish and manage products and different prices oriented toward various groups: corporate, leisure, and business segments.").

450. Phillips further discloses "periodically recalculat[ing] all booking limits based on… demand expected in each class": "***Periodically recalculate all booking limits based on total bookings and demand expected in each class*** until departure. (This recalculation is often called a *reoptimization*.) This dynamic booking control process makes no assumption about the nature of the reoptimization approach being used or the frequency with which reoptimizations occur. And, in fact, there is considerable variation among companies in the optimization approaches used and the frequency and situations under which they are applied. ***There is a general belief that frequent reoptimization is important – particularly when demand is changing rapidly or departure is approaching and bookings and cancellations are being received at a high rate***. Often, the tradeoff is between using a more complex algorithm and reoptimizing less often and using a simpler algorithm and reoptimizing more often. These issues are the topics of ongoing research and are by no means settled." *E.g.*, EX1029 (Phillips), 170; *see*

also EX1029 (Phillips), 264 ("All of the pricing tactics we have studied so far assume that buyers and sellers interact in the same basic fashion. The seller offers a stock of goods to different customer segments through different channels. Potential customers arrive, observe a price, and decide whether or not to purchase. **The seller needs to decide what price to offer for each product to each customer group through each channel. The seller monitors sales of his goods and periodically updates the prices and/or availabilities he is offering. This is the *list pricing* model…."** (italics original)).

451. Indeed, Phillips discloses that "[t]he goal of pricing and revenue optimization is to provide the right price • for every product • to every customer segment • through every channel and to update those prices over time in response to changing market conditions." *E.g.*, EX1029 (Phillips), 26; *see also* EX1029 (Phillips), 133 ("the company needs to determine ***how many units to sell at the lower price(s) and how many to reserve for sale at a higher price***."), 134 ("6.6.2 Revenue Management Systems[:] The primary job of a revenue management system is to ***calculate and update the booking limits within the reservation system.*** Typically a revenue management system is separate from the reservation system but linked to it, as shown in Figure 6.3. The revenue management system receives a feed of bookings and cancellations from the reservation system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The

revenue management system will then send messages to update the booking limits in the global distribution systems."); 101 ("the seller could use a ***combination of allocations and price rises to manage the shortage***"); cl.1[pre].

452. To the extent it is argued that further disclosure of automatically "**adjusting**" by an adjustment factor based on the performance indicator indicating that a performance fails to meet a performance threshold is required, **it would have been obvious based Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura**.

453. **Tamura discloses for each of the one or more participant channels corresponding to the one or more active channel records** (*see* cl.1[c]-[d])**, adjusting** (*e.g.*, "determines the reference retail price for items sold based on the amount of inventory and the number of parts sold during the part period for each item sold" "with reference to the merchandise's distribution market")**, via the channel interface** (*see* cl.1[a])**, a price** (*e.g.*, "price") **if the performance indicator** (*see* cl.1[h]) **indicates a performance that fails to meet a performance threshold** (*e.g.*, "unfavorable" to "sales volume target" (*e.g.*, channel has a "low sales progress relative to the allocated quantity"))**.**

454. For example, Tamura discloses a "price determination part" that "determines a reference retail price" based on "the amount of inventory and the number of parts sold during the part period for each item sold" and further that the

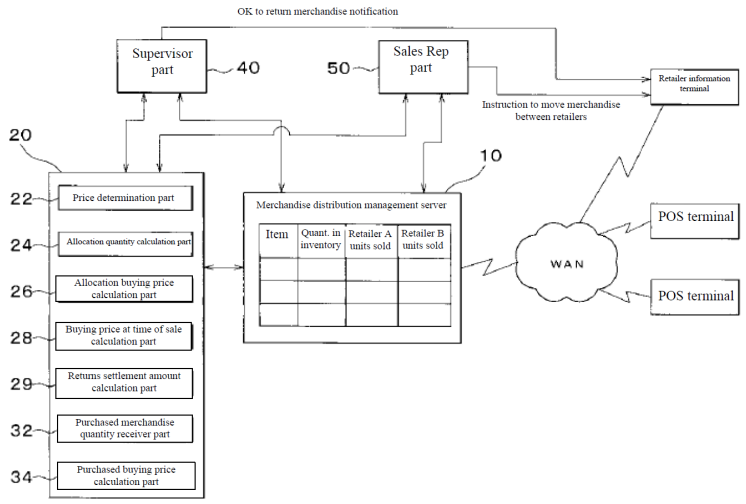
price determination is made ***with reference to the merchandise's distribution market***." As discussed below, POSITA would have understood that this is a disclosure of using Tamura's sales progress rate to determine whether a price adjustment should be made, and further that the price adjustment is made based on whether the performance indicator indicates a performance that fails to meet a performance threshold (*i.e.*, "with reference to the merchandise's distribution market"): "The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy***. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and with reference to the merchandise's distribution market." *E.g.*, EX1005 (Tamura), ¶[0019].

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455. Tamura expressly discloses that the "price determination part," which sets this price, is part of Tamura's "sales management system": "Next, the ***price determination part 22 sets a reference retail price based on the inventory quantity of the item in question and the number of units sold during the unit period*** as stored in the merchandise distribution management server 10 (S102). The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based on the allocation buying price and the allocation quantity of the item." *E.g.*, EX1005 (Tamura), ¶[0025]; *see also* EX1005 (Tamura), cl.1 ("A sales management system comprising: ***a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale***, which is stored in a merchandise distribution management server; an allocated quantity calculation part that calculates the allocated quantity of the items for each retailer; an allocated stocking price calculation part that calculates the allocated stocking price for each retailer based on the allocated quantity of the item calculated by the allocated quantity calculation part; a time of sale stocking price calculation part that calculates the stocking price of the sold item based on the reference retail

price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and a returned goods settlement amount calculation part that calculates the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity."), Figs.3:

Fig. 3



456. In addition, Tamura discloses "The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate." *E.g.*, EX1005 (Tamura), cl.4.

457. Tamura further discloses "The allocated buying price calculation part 26 calculates the allocated buying price to each retailer based on the allocation quantity of the item in question calculated by the allocation quantity calculation part 24. The allocated buying price is the price that the retailer should pay to the merchandise entity for the allocated merchandise provided by the merchandise entity when buying the merchandise. ***The allocated buying price is based on the reference retail price in the price determination part 22, multiplied by a certain multiplying factor (e.g., 20% of the reference retail price)*** that covers procurement costs, such as the factory production price, plus logistics costs. The entity operating the retail store pays the allocated buying price to the merchandise planning entity within a certain period (e.g., within one month) from the time the goods are allocated and the allocated goods are delivered from the merchandise planning entity. From the perspective of the merchandise planning entity, the allocated buying price is in character a deposit for placing the allocated merchandise with the retailer." *E.g.*, EX1005 (Tamura), ¶[0021].

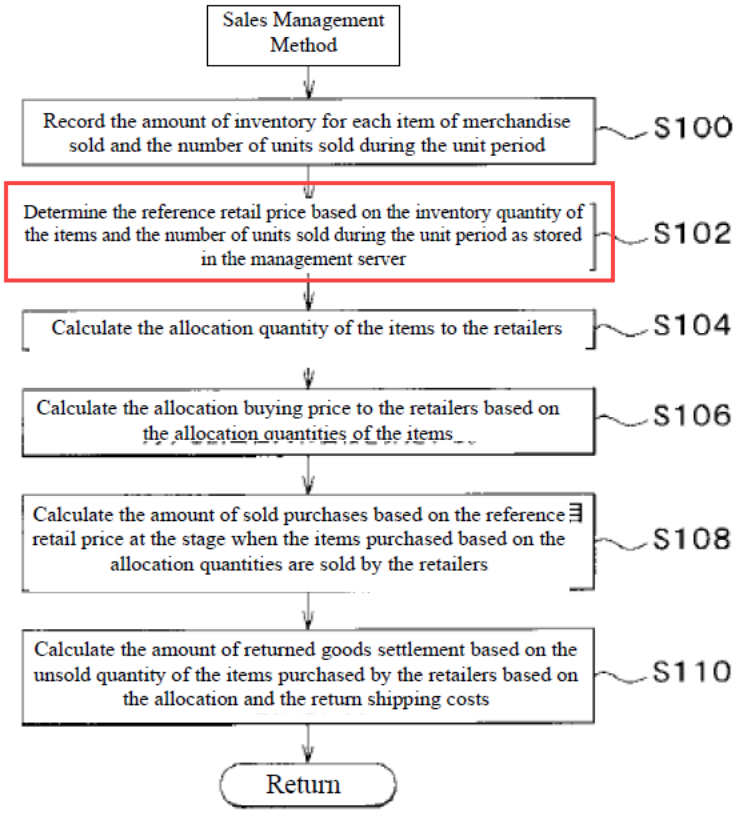
458. In addition, Tamura discloses that "The purchase price calculation part 28 calculates the sold purchase price based on the reference retail price at the stage when the relevant item purchased based on the allocation quantity is sold by the retailers. ***The sold buying price is determined according to the buying prices for the retailers at the point of sale by multiplying a certain multiplying factor (e.g.,***

60% of the reference retail price) based on the reference retail price in the price determination part 22. The sold buying price is linked to the reference retail price, which is determined flexibly by the price determination part 22 and differs from the allocated buying price by the amount of the change between the reference retail price and the multiplying factor. Therefore, the retailer determines the purchase price of the allocated merchandise from the merchandise entity by multiplying the allocated merchandise from the merchandise entity by the sold purchase price." *E.g.*, EX1005 (Tamura), ¶[0022].

459. Tamura also discloses that its "merchandise distribution management server" "determines the reference retail price": "The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step***: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100); a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation

quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." *E.g.*, EX1005 (Tamura), ¶[0014]; *see also* EX1005 (Tamura), Fig.2:

Fig. 2



460. As discussed, both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004

(Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. As also discussed, Jacob discloses "computer program systems configured to manage the data and perform the methods/functions of the invention" and "code segments form a code segment configured to manage hotel data, and other time-dependent inventory data." *E.g.*, EX1004 (Jacob), ¶[0082]; *see also* EX1004 (Jacob), ¶[0005] (update prices with "minimum of data entry by the staff"). Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose computers." EX1004 (Jacob), ¶¶[0082], [0083]; *see also* EX1004 (Jacob), ¶¶[0131]-[0133], [0191]. Tamura expressly discloses "a merchandise distribution management server 10 that executes each step" (*e.g.*, EX1005 (Tamura), ¶[0014]), "a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale," and "announc[ing] to retailers… the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise," which POSITA would have understood is the sales progress rate, and "with reference to the merchandise's distribution market," which

POSITA would have understood discloses adjusting based on sale data corresponding to at least one or more additional vendor computing devices (*see* cl.1[g]). *E.g.*, EX1005 (Tamura), cl.1; *see also* EX1005 (Tamura), ¶[0019] ("the price determination part 22 takes a strong attitude toward the reference retail price" or "takes a weak attitude toward the reference retail price or plans a sales promotion strategy"), [0025], Fig.3).

461. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's or Jacob-Phillips's inventory management and distribution system (in the recited combinations) (including Jacob's disclosure of "analyzing the information received from *the* sales channels," implementing discounted/promotional rates/taking a percentage off the rate for a particular room type, and storing such updated pricing information) using Tamura's beneficial teachings of automatically adjusting a price of items if performance fails to meet a performance threshold, such that in the resulting system the adjusting occurs automatically without the need for a user of the combined system to instruct the system to perform such adjustment and the updated price information is communicated to both the system's clients (*e.g.*, Properties) and the sales channels.** To the extent it is argued that automatically adjusting by an adjustment factor based on the performance indicator indicating that a performance fails to meet

a performance threshold is required and is not disclosed by Jacob or rendered obvious by Jacob-Phillips, this would have beneficially furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, reducing the response time/increasing the speed of the system (by reducing the need to wait for and address user intervention) and by increasing the ability of the system to take into account the result of processing sale data from multiple distribution channels in determining whether/how to adjust a price of items, thereby allowing the system to more quickly and effectively address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004 (Jacob), ¶[0002]; *see also* EX1004 (Jacob), ¶[0005] ("The system should allow the administrator to change the pricing of all items based upon…any… factor affecting price, with a minimum of data entry by the staff")). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

See, *e.g.*, EX1029 (Phillips)[32] (discussing existing systems automatically adjusting price and channel allocations for inventory including transportation services – *e.g.* at 30 ("In very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations."), 123 ("For ***airlines, hotels, rental car companies, and cruise lines, booking control is a function of the reservation system. Tactical revenue management is the "brains"*** of the process. It is where ***future demand is forecast, optimization algorithms run, and booking limits set and updated***. We first discuss the strategy of revenue management and how it applies in different industries. We then turn to a somewhat detailed discussion of ***booking control—the "real-time" face of revenue management***."; "Once products and prices have been established, **revenue management tactics require setting and updating limits on how much of a particular product can be sold at a particular fare to each segment for some period of time**—say, a day or a week. ***Booking control*** **is the moment-to-moment determination of which booking requests**

[32] To the extent it is argued that further disclosure of adjusting , via the channel interface, a price of the transportation service by an adjustment factor is required, this would have been obvious by the disclosures of Phillips (which is already part of the recited combinations) for the same reasons as those set forth above.

should be accepted and which should be rejected." (italics in this last quote are original)), 131 ("The job of ***tactical revenue management*** is to ***calculate and periodically update booking limits***. These booking limits are transmitted to the reservation system, which then uses them to determine which booking requests to accept and which to reject based on the logic described in Section 6.5. To introduce the tactical revenue management problem in its most general form, it is useful to define resources, products, and fare classes. • Resources are units of capacity managed by a supplier. Examples of resources are a flight departure, a hotel room night, and a rental car day. Each resource is constrained—the flight departure has a limited number of seats, the hotel only has a limited number of rooms it can sell, and a rental car company has only so many cars it can rent out on a particular day. • Products are what customers seek to purchase. A product may require use of one or more resources. A seat on Flight 130 from St. Louis to Cleveland on Monday, June 30, is a product that uses only a single resource. A two-night stay at the Sheraton Cleveland for a customer arriving on March 19 and departing on March 21 is a product that uses two resources: a room night on March 19 and a room night on March 20. • There are one or more ***fare classes*** associated with each product. ***Each fare class is a combination of a price and a set of restrictions on who can purchase*** the product and when. As discussed in Section 6.3, different fare classes can be used to establish different virtual products, for group pricing, for regional pricing, or for

combinations of all of these."), 133 ("the company needs to determine ***how many units to sell at the lower price(s) and how many to reserve for sale at a higher price***."), 134 ("6.6.2 Revenue Management Systems[:] The primary job of a revenue management system is to ***calculate and update the booking limits within the reservation system***. Typically a revenue management system is separate from the reservation system but linked to it, as shown in Figure 6.3. The revenue management system receives a feed of bookings and cancellations from the reservation system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems."), 99 ("the tactic of ***variable pricing***… is ***used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***."), 106-07 ("a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity"), 112-13 ("***Passenger airlines*** certainly meet the criteria for ***variable pricing***—constrained capacity with demand that fluctuates over time. ***Southwest Airlines implements variable pricing directly by changing fares for their departures in order to match demand with the restricted capacity***. However, the major "***nondiscount" airlines also practice variable pricing. They do so by opening and closing the availability of various fare classes on different flights***.… In this case, the airline is adjusting the

average fare not by changing the list price but by opening and closing fare classes. When total demand is anticipated to be high, the airline will restrict availability of discount fares, causing the average fare to increase. When total demand is anticipated to be low, the airline will open availability of deep discounts, causing the average fare to drop. It is continually monitoring demand using its revenue management system to determine which classes to open and close on each flight. We describe how this is done in some detail in Chapters 6 and 7. [¶] Discount airlines use variable pricing even more directly. ***If demand at Southwest Airlines begins to rise more quickly or more slowly than anticipated, Southwest may change the price***. Southwest does not attempt to use prices to segment customers between "high-elasticity" and "low-elasticity" segments—rather, it is using variable pricing without segmentation to maximize the return from each flight and, to some extent, to smooth demand through demand diversion from high-fare/high-utilization flights to low-fare/low-utilization flights."), 120 ("the techniques can be ***applied to any situation in which a seller needs to determine how to allocate a fixed supply among different channels or customer segments paying different prices***"), 79 ("4.3.2 Channel Pricing[:] ***Channel pricing is the practice of selling the same product for different prices through different distribution channels***. Here are some examples. • Barnes and Noble sells books for different prices online than through its outlets. • Special "Web-only" fares for airline tickets are available through the Internet but not through

travel agencies. • Many fashion and home furnishing merchants offer lower prices for merchandise through mail-order catalogs than for the same merchandise sold through retail outlets. [¶] As with other price differentiation schemes, there can be more than one reason why a seller might charge different prices through different channels. One is cost—for many companies, selling through the Internet is cheaper than selling through traditional channels. Continental Airlines calculated that distribution costs for a $325 ticket are about $43 when the ticket is sold through a travel agent versus only $18 when the same ticket is sold through Continental's Web site. This difference in itself would be sufficient reason for Continental to charge lower prices on its Web site."), 80 ("However, it is also the case that ***customers arriving via different channels have different price sensitivities***. For personal loans, it has been shown that *customers inquiring through the Internet* are more price sensitive than those contacting a call center, who are in turn more price sensitive than those who apply for a loan at a retail branch. Furthermore, ***Internet customers who access a consolidator Web site or use a shopping 'bot tend to be more price sensitive than those who go directly to a bank's Web site***. This is not surprising given the characteristics of the channels—it is generally easier and more convenient to shop and compare prices during a single Internet session than by making many phone calls. Thus differential willingness to pay is also a motivation for channel pricing."), 124 ("**Airlines are also enthusiastic channel pricers**; ticket prices on

the Internet are often cheaper than through travel agents. Other revenue management companies followed the airlines in segmenting their market, creating virtual products and establishing a wide range of prices. **Hotels and rental car companies** establish and manage products and different prices oriented toward various groups: corporate, leisure, and business segments."), 101 ("the seller could use a ***combination of allocations and price rises to manage the shortage***"), 31 ("A number of pricing execution or 'pricing management' vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that complex pricing changes are correctly and efficiently transmitted through all channels"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE and Worldspan.[] Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines"), 170 ("***Periodically recalculate all booking limits based on total bookings and demand expected in each class*** until departure. (This recalculation is often called a *reoptimization*.) This dynamic booking control process makes no assumption about the nature of the reoptimization approach being used or the frequency with which reoptimizations occur. And, in fact, there is considerable variation among companies in the optimization approaches used and the frequency and situations under which they are applied. ***There is a general belief that frequent reoptimization is important – particularly when demand is changing rapidly or***

departure is approaching and bookings and cancellations are being received at a high rate. Often, the tradeoff is between using a more complex algorithm and reoptimizing less often and using a simpler algorithm and reoptimizing more often. These issues are the topics of ongoing research and are by no means settled."), 264 ("All of the pricing tactics we have studied so far assume that buyers and sellers interact in the same basic fashion. The seller offers a stock of goods to different customer segments through different channels. Potential customers arrive, observe a price, and decide whether or not to purchase. **The seller needs to decide what price to offer for each product to each customer group through each channel. The seller monitors sales of his goods and periodically updates the prices and/or availabilities he is offering. This is the *list pricing* model…."** (italics original)); EX1026 (Choi), 2 ("One offers discounted rates to stimulate demand for inventory that would otherwise go unsold, but limits the availability of discounts to customers who are willing to pay a higher price…."; "Sophisticated revenue-management systems apply an inventory-allocation algorithm to make the best allocation decisions, which are then communicated to users in the form of restrictions on each rate-bucket level. Allocation decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions.").

462. In addition, Tamura expressly discloses two sales channels ("Retailer A" and "Retailer B"). As such, POSITA would have understood that although Jacob provides examples of multiple sales channels, the disclosures of the combined systems (including adjusting a price of inventory items would have applied to a system with two sales channels, in addition to a system with more.

463. Thus, in my opinion, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura renders obvious this limitation.

464. As discussed above with respect to cls.1[g]-[h], Jacob or Jacob-Phillips (in the recited combinations) in view of Kono renders obvious receiving sale data for one or more participant channels (*see* cl.1[g]) corresponding to the one or more active channel records (*see* cl.1[d]). And as discussed immediately above, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura renders obvious automatically "**adjusting**" a price of the transportation service based on a performance that fails to meet a performance threshold. **It would have been obvious, straightforward, and advantageous to implement Jacob in view of Kono or Jacob-Phillips in view of Kono (in the recited combinations, including Jacob's code segments) using Tamura's additional teaching of automatically adjusting a price of inventory items based on a performance indicator indicating that a performance fails to meet a performance threshold. As discussed, both Tamura and Kono describe inventory management systems**

using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Implementing the combined system (including the recited Kono combinations) using Tamura's beneficial teaching of automatically adjusting a price of inventory items based on a performance that fails to meet a performance threshold would have beneficially furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory," Tamura's express goals of "reducing lost sales opportunities," and Kono's express goal of reducing "unnecessary inventory on the market" by, *e.g.*, allowing the system to more quickly address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory (and communicating such adjustment to both the system's clients (*e.g.*, Properties) and the sales channels), thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004 (Jacob), ¶[0002]; *see also* EX1004 (Jacob), ¶[0005] ("minimum of data entry by the staff")) and "reducing lost sales opportunities" (EX1005 (Tamura), ¶[0001]). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation

choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029[33] (discussing existing systems automatically adjusting price and channel allocations for inventory including transportation services); EX1026 (Choi) (same for hotel inventory) (*see* citations in cl.1[i], immediately above).

465. Thus, in my opinion, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura and Kono renders obvious this limitation.

* * *

466. Thus, in my opinion, (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono render obvious this claim.

[33] *See* n.32, *supra*.

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9. Claim 2 is Rendered Obvious By (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

467. As discussed above, claim 1, from which claim 2 depends, is rendered obvious over (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono. *See* cl.1. In my opinion, **claim 2 is rendered obvious over (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and**

Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono. *See infra*, pp.747-778.

468. Claim 2 recites **"The computer-implemented method of claim 1, wherein the processing the sale data comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel." In my opinion, Jacob/Jacob-Evangelist/Jacob-Franklin/Jacob-Evangelist-Franklin discloses or at minimum renders obvious this limitation. Alternatively, in my opinion, Jacob/Jacob-Evangelist/Jacob-Franklin/Jacob-Evangelist-Franklin in view of Kono renders obvious this limitation.**

469. In my opinion, **Jacob discloses processing the sale data** (*e.g.*, "analyz[ing] the information received from the sales channels"; *see* cl.1[g], [h]) **comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel** (*e.g.*, determining whether/"[i]f a sales channel's Room Type inventory is sold out"; determining "days that might be selling out soonest")**.**

470. For example, Jacob discloses determining whether a "sales channel's Room Type inventory is sold out," which POSITA would have understood is a determination of whether a supply exceeds demand or vice versa for each online distribution channel: "***If a sales channel's Room Type inventory is sold out*** or is selling better than other channels, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to close the Rate Type/Room Type, for a given date or a series of dates, for certain channels." *E.g.*, EX1004 (Jacob), ¶[0180]; *see also* EX1004 (Jacob), ¶[0176] ("The PA monitors room inventory levels for the days in the Rate Type active period to identify the ***days that might be selling out soones***t. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates.").

471. Jacob further discloses that it "performs calculations automatically," which POSITA would have understood to include determining/calculating whether "a sale's channel's Room Type Inventory is sold out." For example, Jacob discloses "Calculate the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations***

automatically and/or perform calculations in response to a user initiated triggering event, such as a mouse click." *E.g.*, EX1004 (Jacob), ¶[0131]; *see also* EX1004 (Jacob), ¶[0132] ("Automatically recalculate prices for associated Room Types in response to changes in the BAR rate. The ***code segment may be configured to perform calculations automatically*** and/or perform calculations in response to a user initiated triggering event, such as a mouse click.").

472. Jacob additionally discloses that its "Functions" are, *e.g.*, "computer algorithms" performed by Jacob's "code segments" of its computer/server running, *e.g.*, Jacob's RezTrip application: "As used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which manage data do so through their associated functions." *E.g.*, EX1004 (Jacob), ¶[0078].

473. Thus, in my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.

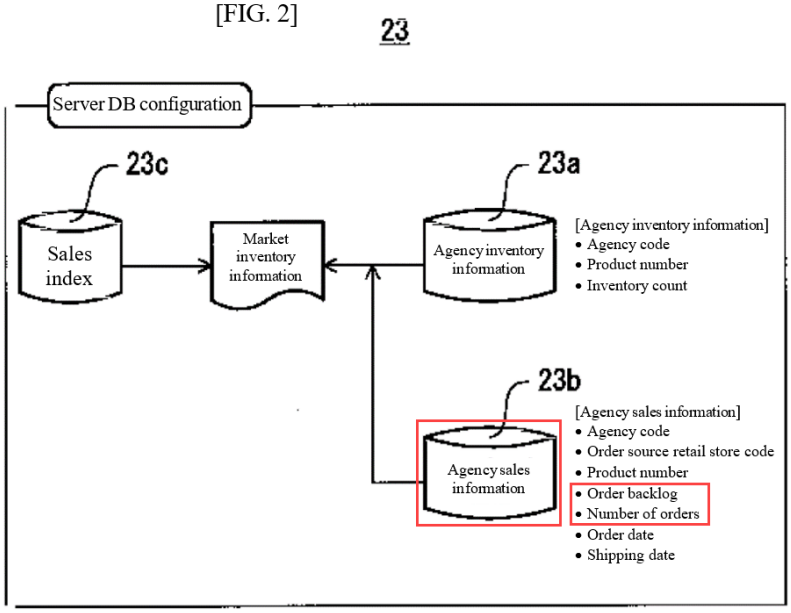
474. Jacob expressly discloses the additional limitation of this claim. *E.g.*, EX1004 (Jacob), ¶[0180]. To the extent it is argued further disclosure of "determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel" is required, **it would have been obvious based on Jacob (*see* n.26) (in the recited combinations of claim 1) in view of Kono**.

475. **Kono discloses processing the sale data** (*e.g.*, "sales analysis at each agency"; *see* cl.1[g], [h]) **comprises determining whether or not a supply of exceeds demand or vice versa per distribution channel** (*e.g.*, "check[ing] the sales of each agency" to determine if there exists a "backlog of orders" but "products are presently… out of stock"; determining "excess inventory and inventory shortage on the agency side"; determining "agencies having excess inventory"/"agencies having insufficient inventory")**.**

476. For example, Kono discloses that it "checks the sales of each agency," including whether there is a "backlog of orders" but products are "out of stock." POSITA would have understood that this is a disclosure of processing sale data to determine whether or not a supply of inventory exceeds demand or vice versa for each distribution channel: "The maker-side server device 2 checks the sales of each agency by referring to the contents of this form. In the example illustrated in FIG. 4, at the agency "ffff" ***the shipping volume for the last month is 250, and the backlog of orders is 250, while the remaining inventory is more than enough at 2,500***. Since the production of product "AAAAAAA" has been stopped and a new substitute product is already scheduled to be introduced to the market, the product "AAAAAAA" will not be sold in the future. In this case, conventionally, products that are no longer necessary at the agency will be returned from the commercial practice of daily necessities, and the maker must pay the agency for the price of the

return. On the other hand, at the agency "bbbb," ***the inventory count is 336, and the backlog of orders remaining is 2,390, and movement of products is still active, and products are presently still out of stock***." *E.g.*, EX1007 (Kono), ¶[0043]; *see also*, EX1007 (Kono), ¶[0042] ("In the previous steps S4 and S5, for example, production of a product having a product number "AAAAAAA" is stopped. ***The form illustrated in FIG. 4 shows the current inventory count, backlog of orders, and shipment count for the last month at agencies*** "aaaa to qqqq" that handle this product number "AAAAAAA."), Figs.2, 4:

[FIG. 2]



[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

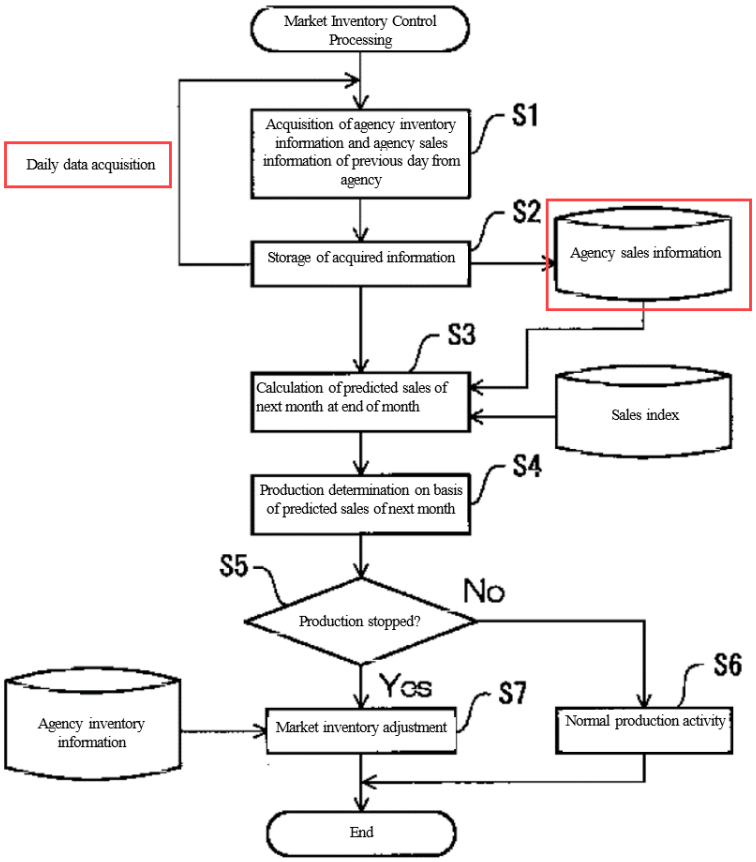
477. And, as previously discussed, Kono processes its sales data by performing a sales analysis at each agency: "[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, ***the manufacturer server device is provided with***: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; ***analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency***; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses.

Moreover, the above configuration is further provided with: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and the ***sales index of each agency stored in the agency shipment information database*** and the sales index database, estimate the sales volume of the product on the overall market and ***performs a sales analysis at each agency***." *E.g.*, EX1007 (Kono), ¶[0009]; *see also* EX1007 (Kono), ¶[0010] ("According to the present invention having such characteristics, by connecting the manufacturer server device and the terminals of each agency by a direct network, the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each agency in real time. ***The manufacturer server device estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and monthly sales index data of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed.*** As a result, transfer (resale, etc.) of the inventory product from the

agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed.").

478. Kono further discloses that as part of this sales analysis, the "demand forecast of the overall market" is "analyzed." For example: "According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network, can acquire product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time. ***The maker estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and sales index of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed.*** As a result, resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." *E.g.*, EX1007(Kono), ¶[0014]; *see also* EX1007 (Kono), Fig.3:

[FIG. 3]



479. Kono further discloses that, as a result of this analysis, it determines "excess inventory and inventory shortage on the agency side," which POSITA would have understood is an additional express disclosure of determining whether a supply of inventory items exceeds demand or vice versa per distribution channel: "In other words, the maker side does not receive returned products, and only a return fee is sufficient, and therefore costs are reduced, and wasteful production may be avoided. Moreover, on the agency "ffff" side, bad inventory can be accounted for. Inventory

on the market can be controlled and effectively utilized in such a manner that at the agency "bbbb," necessary amounts can be secured and sales can be continuously secured as well. Moreover, because this type of information is periodically updated (daily), the inventory on the overall market can be always known, and it is possible to rapidly respond to this type of situation (***excess inventory and inventory shortage on the agency side***)." *E.g.*, EX1007 (Kono), ¶[0050]; *see also* EX1007 (Kono), ¶[0053] ("Moreover, according to the market inventory control method of the present information, when transferring inventory product between agencies, a response is made by resale of the inventory product from the agency where sales have fallen to the agency that still sells, and only the distribution cost required for resale is borne by the manufacturer, and therefore, the manufacturer does not receive returned products, and only a return fee paid as a distribution fee is sufficient, and therefore costs are reduced, and wasteful production may be avoided. Moreover, inventory on the market can be controlled and effectively utilized in such a manner that at ***agencies having excess inventory, bad inventory can be accounted for, and at agencies having insufficient inventory, necessary amounts can be secured and sales can be continuously secured as well***.").

480. As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004

Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Kono expressly discloses that its system "checks the sales of each agency" to determine if there exists a "backlog of orders" but "products are presently… out of stock," determining "excess inventory and inventory shortage on the agency side," and determining "agencies having excess inventory" and "agencies having insufficient inventory." *E.g.*, EX1007 (Kono), ¶¶[0042], [0043], [0050], [0053], Figs.2, 4.

481. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's inventory management and distribution system (in the recited combinations) using Kono's beneficial explicit teachings of determining whether or not inventory supply exceeds demand or vice versa per participant channel.** This would have beneficially and advantageously increased the ability of the resulting system to monitor and track accurately inventory status and availability at each sales channel, thereby permitting the system to determine and better analyze how quickly a particular sales channel is selling inventory, whether a particular sales channel is running out of inventory, and to compare and determine accurately whether a particular channel is selling inventory better than other channels (including by, *e.g.*,

selling out). This would have furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" and reducing "unnecessary inventory on the market." For POSITA it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

* * *

482. Thus, in my opinion, (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono render obvious this claim.

10. Claim 3 is Rendered Obvious By (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

483. As discussed above, claim 1, from which claim 3 depends, is rendered obvious by (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono. *See* cl.1. In my opinion, **claim 3 is rendered obvious over (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view**

of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono. *See infra*, pp.748-752.

484. Claim 3 recites **"The computer-implemented method of claim 1, wherein the one or more active channel records are linked to the channel interface without the one or more inactive channel records." In my opinion, Jacob/Jacob-Evangelist/Jacob-Franklin/Jacob-Evangelist-Franklin in view of Tamura renders obvious this limitation.**

485. In my opinion, **Jacob discloses active channel records are linked to the channel interface** (*see* cl.1[a], [d], [f])**.**

486. **Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive** (*see* cl.1[e])**.**

487. For example, Phillips discloses that "**The goal of pricing and revenue optimization is to provide the right price,**

- for every product
- to every customer segment
- **through every channel**

and to update those prices over time in response to changing market conditions. The three dimensions of pricing and revenue optimization can be illustrated in a cube, as

shown in Figure 2.4. Each element within the cube represents a combination of product, channel, and customer segment. Each element (or *cell*) has an associated price. For example, one element might be: *medium-size turbines sold to large customers in the northeast via the direct sales channel* Another element might be: *Replacement gears sold to small companies via online sales*[.] In theory, each cell within the PRO cube could correspond to a different price. In practice, some cells may not be meaningful. **Some products may not be offered through some channels,** for example." *E.g.*, EX1029 (Phillips), 26 (italics in this quote original).

488. In addition, Phillips discloses "Global distribution systems provide a conduit connecting the reservation system and a number of important sales outlets-particularly travel agents. There are currently over 180,000 GDS terminals worldwide. Most of these terminals are placed with travel agents, but some are in the travel offices oflarge companies (Marvel 2004). The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan…. Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines. Most airlines, major hotel chains, major rental car companies, and cruise lines have contracts with most or all of the global distribution systems allowing them to distribute and sell their products. There are exceptions: ***Both Southwest Airlines and JetBlue Airways***

subscribe only to SABRE and do not accept bookings through any other GDS (Kontzer 2004)." *E.g.*, EX1029 (Phillips), 126.

489. Phillips further discloses, for example, that "[i]n fact, ***it is not uncommon for individual sellers to be utilizing different approaches for different products through different channels***. For example, an automobile manufacturer is likely to sell the majority of vehicles through dealers, utilizing a combination of "shelf price" (in this case, the wholesale price) and promotions. However, Ford Motor Company receives about 9% of its revenue in North America from group sales of cars to corporate, government, and industrial fleets. These sales are generally priced through individual negotiations or bids. Finally, ***a manufacturer may also be selling some cars directly to the public through a deal with an online channel***. In this case, the manufacturer needs to apply pricing and revenue optimization across the entire range of its channels and pricing mechanisms in order to maximize total profitability." *E.g.*, EX1029 (Phillips), 29.

490. Phillips further discloses, *e.g.*, "The range of costs shown in Figure 6.4 represents a channel-pricing opportunity. It also provides an expanded opportunity for revenue management—***airlines and hotels can establish fare classes based on the channel of a booking request and determine whether or not to provide availability through that channel.*** Furthermore, it provides a tremendous economic incentive for revenue management companies to steer demand as much as possible

through lower-cost channels. While online travel has been booming, the global distribution systems still account for about 60% of bookings for a typical airline and about 68% for a typical hotel, leaving plenty of scope for future savings (Grossman 2004)." *E.g.*, EX1029 (Phillips), 137-38; *see also* EX1029 (Phillips), 79 ("Special ***"Web-only" fares for airline tickets are available through the Internet but not through travel agencies***."), 31 ("For an airline or hotel, prices are updated by opening or closing fare classes—a process discussed in more detail in Chapter 6. In other cases, ***a "pricing matrix" database specifies which prices are available to which customers through which channels***.").

491. As discussed, both Jacob and Phillips describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1029 (Phillips), 9, 30, 33, 121-122, 134-135, 141. In addition, Jacob expressly discloses active channel records are linked to the channel interface. *See* cl.1[a], [d], [f]. And Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive. *See* cl.1[c].

492. In my opinion, based on these express disclosures, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob (in the recited combinations), including its disclosures of storage of "hotel**

data" comprising, *e.g.*, "sales channel data" and "inventory data," using Jacob's and Phillips's beneficial teachings of not selecting/de-selecting certain channels (discussed *supra*) to participate/from participating in selling Jacob's transportation services inventory such that the system (in the recited combinations) establishes, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service, including by establishing channel records of non-participant channels with data reflecting that they are inactive, and not linking these inactive channel records to/omitting these inactive records from the channel interface. This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should a price adjustment or additional sales channels become necessary (*e.g.*, if existing participant channels are not selling well or if they have a lower expected net contribution to revenue)—including by maintaining records of the inactive channels, but omitting those records from the channel interface for communication between

the vendor computing device and the RezTrip computer/server unless and until they become active records (*e.g.*, if they are later selected by, *e.g.*, a Property's personnel (*see* cl.1[c]) to participate in selling Jacob's transportation services inventory) (thereby reducing complexity and increasing efficiency by, *e.g.*, reducing the number of channel records linked to the interface, avoiding unnecessary data transfer, saving bandwidth, and avoiding presentation of material to Property personnel that is not immediately pertinent). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" (*e.g.*, EX1004 (Jacob), ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Phillips's express goal of, *e.g.*, "maximizing *expected net contribution*," which is "price (fare) minus incremental cost," consistent with Phillips's teaching that there is "tremendous economic incentive… to steer demand as much as possible through lower-cost channels."; EX1029 (Phillips), 136-138 (emphasis original). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.

* * *

493. Thus, in my opinion, (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono render obvious this claim.

11. Claim 4 is Rendered Obvious By (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

a. Element 4[pre][34]

494. **In my opinion, claim 4 is rendered obvious over (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of**

[34] To the extent limiting, the preamble is disclosed.

Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono. *See infra*, pp.753-777.

495. Claim 4[pre] recites **"A computer-implemented method of managing online bookings for transportation services inventory, the computer-implemented method comprising." In my opinion, Jacob discloses this limitation or Jacob in view of Phillips renders obvious this limitation.** *See* cl.1[pre].

496. **Jacob discloses a computer-implemented method** (*see* cl.1[pre]) **of managing online bookings** (*see* cl.1[pre]) **for transportation services inventory** (*see* cl.1[pre])**.** *See* discussion of cl.1[pre].

497. **Phillips discloses a computer-implemented method** (*see* cl.1[pre])**, including in the context of managing online bookings** (*see* cl.1[pre]) **for transportation services** (*see* cl.1[pre])**, using software to optimize and automate**

functions so they can be performed without human intervention (*see* cl.1[pre])**.** *See* discussion of cl.1[pre].

b. Element 4[a]

498. Claim 4[a] recites **"establishing a channel interface that provides bidirectional communication between at least one server computing device and a vendor computing device." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.1[a]. **Alternatively, Jacob (in the recited combinations) in view of Tamura, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.** *See* cl.1[a].

499. **Jacob discloses establishing a channel interface** (*see* cl.1[a]) **that provides bidirectional communication** (*see* cl.1[a]) **between at least one server computing device** (*see* cl.1[a]) **and a vendor computing device** (*see* cl.1[a])**.** *See* discussion of cl.1[a].

500. **Tamura discloses establishing a channel interface** (*see* cl.1[a]) **that provides bidirectional communication** (*see* cl.1[a]) **between at least one server computing device** (*see* cl.1[a]) **and a vendor computing device** (*see* cl.1[a])**.** *See* discussion of cl.1[a].

501. **Kono discloses establishing a channel interface** (*see* cl.1[a]) **that provides bidirectional communication** (*see* cl.1[a]) **between at least one server**

computing device (*see* cl.1[a]) **and a vendor computing device** (*see* cl.1[a])**.** *See* discussion of cl.1[a].

c. Element 4[b]

502. Claims 4[b] recites **"storing, via a channel data structure, a channel record for each of a plurality of distribution channels." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.1[b]. **Alternatively, Jacob (in the recited combinations) in view of Tamura, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.** *See* cl.1[b].

503. **Jacob discloses storing** (*see* cl.1[b])**, via a channel data structure** (*see* cl.1[b])**, a channel record** (*see* cl.1[b]) **for each of a plurality of distribution channels** (*see* cl.1[b])**.** *See* discussion of cl.1[b].

504. **Tamura discloses storing** (*see* cl.1[b]) **via a channel data structure** (*see* cl.1[b])**, a channel record** (*see* cl.1[b]) **for each of a plurality of distribution channels** (*see* cl.1[b])**.** *See* discussion of cl.1[b].

505. **Kono discloses storing** (*see* cl.1[b])**, via a channel data structure** (*see* cl.1[b])**, a channel record** (*see* cl.1[b]) **for each of a plurality of distribution channels** (*see* cl.1[b])**.** *See* discussion of cl.1[b].

d. Element 4[c]

506. Claims 4[c] recites **"receiving, from the vendor computing device through the channel interface, a selection, from the plurality of distribution channels, of one or more participant channels for a transportation service." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.1[c]. **Alternatively, Jacob (in the recited combinations) in view of Evangelist renders obvious this limitation.** *See* cl.1[c].

507. **Jacob discloses receiving** (*see* cl.1[c])**, from the vendor computing device** (*see* cl.1[a], [c]) **through the channel interface** (*see* cl.1[a], [c])**, a selection** (*see* cl.1[c])**, from the plurality of distribution channels** (*see* cl.1[b], [c])**, of one or more participant channels for a transportation service** (*see* cl.1[b], [c])**.** *See* discussion of cl.1[c].

508. **Evangelist discloses receiving a selection, from a plurality of distribution channels, of one or more participant channels for inventory** (*see* cl.1[c])**.** *See* discussion of cl.1[c].

e. Element 4[d]

509. Claim 4[d] recites **"establishing, via the channel data structure, one or more active channel records based upon the one or more participant channels for the transportation service." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.1[d]. **Alternatively, Jacob (in the recited combinations) in view of Tamura,**

and Jacob (in the recited combinations) in view of Kono, render obvious this limitation. *See* cl.1[d].

510. **Jacob discloses establishing** (*see* cl.1[d])**, via the channel data structure** (*e.g.*, cl.1[b], [d])**, one or more active channel records** (*see* cl.1[d]) **based upon the one or more participant channels for the transportation service** (*see* cl.1[c], [d])**.** *See* discussion of cl.1[d].

511. **Tamura discloses establishing** (*see* cl.1[d])**, via the channel data structure** (*e.g.*, cl.1[b], [d])**, one or more active channel records** (*see* cl.1[b], [d]) **based upon one or more participant channels** (*see* cl.1[d])**.** *See* discussion of cl.1[d].

512. **Kono discloses establishing** (*see* cl.1[d])**, via the channel data structure** (*e.g.*, cl.1[b], [d])**, one or more active channel records** (*see* cl.1[b], [d]) **based upon one or more participant channels** (*see* cl.1[d])**.** *See* discussion of cl.1[d].

f. Element 4[e]

513. Claim 4[e] recites **"establishing, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See*

cl.1[e]. **Alternatively, Jacob (in the recited combinations) in view of Phillips renders obvious this limitation.** *See* cl.1[e].

514. **Jacob discloses establishing** (*see* cl.1[d], [e])**, via the channel data structure** (*see* cl.1[b], [e])**, one or more inactive channel records based upon one or more non-participant channels for the transportation service** (*see* cl.1[b], [c], [d], [e])**.** *See* discussion of cl.1[e].

515. **Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive** (*see* cl.1[e])**.** *See* discussion of cl.1[e].

g. Element 4[f]

516. Claim 4[f] recites **"linking the one or more active channel records to the channel interface." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.1[f]. **Alternatively, Jacob (in the recited combinations) in view of Kono renders obvious this limitation.** *See* cl.1[f].

517. **Jacob discloses linking the one or more active channel records** (*see* cl.1[d], [f]) **to the channel interface** (*see* cl.1[a], [f])**.** *See* discussion of cl.1[f].

518. **Kono discloses linking the one or more active channel records** (*see* cl.1[d], [f]) **to the channel interface** (*see* cl.1[a], [f])**.** *See* discussion of cl.1[f].

h. Element 4[g]

519. Claim 4[g] recites **"receiving, in real time for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, sale data corresponding to at least one or more additional vendor computing devices." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.1[g]. **Alternatively, Jacob (in the recited combinations) in view of Franklin, or Jacob or Jacob-Franklin (in the recited combinations) in view of Tamura, and Jacob or Jacob-Franklin (in the recited combinations) in view of Kono, render obvious this limitation.** *See* cl.1[g].

520. **Jacob discloses receiving** (*see* cl.1[g])**, in real time** (*see* cl.1[b], [g]) **for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[c]-[d], [f], [g])**, sale data**[35] (*see* cl.1[g]) **corresponding to at least one or more additional vendor computing devices** (*see* cl.1[a], [g])**.** *See* discussion of cl.1[g].

[35] Jacob discloses "sale data" as required by cl.4[g]. To the extent it is argued further disclosure is required, as discussed below Jacob in view of Tamura, or Jacob in view of Kono, renders obvious "sale data."

521. **Tamura discloses receiving** (*see* cl.1[g]) **sale data** (*see* cl.1[g]) **for one or more participant channels** (*see* cl.1[c], [g]) **corresponding to the one or more active channel records** (*see* cl.1[d], [g])**.** *See* discussion of cl.1[g].

522. **Kono discloses receiving** (*see* cl.1[g]) **sale data** (*see* cl.1[g]) **for one or more participant channels** (*see* cl.1[c], [g]) **corresponding to the one or more active channel records** (*see* cl.1[d], [g])**.** *See* discussion of cl.1[g].

523. **Franklin discloses receiving** (*see* cl.1[g]) **data** (*see* cl.1[g]) **in real time** (*see* cl.1[g]) **from another computer** (*see* cl.1[g])**.** *See* discussion of cl.1[g].

i. Element 4[h]

524. Claim 4[h] recites **"determining a performance indicator in real time, for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, based at least on the sale data corresponding to said at least one or more additional vendor computing devices." In my opinion, Jacob (in the recited combinations) discloses or renders obvious this limitation.** *See* cl.1[h]. **Alternatively, Jacob (in the recited combinations) in view of Phillips, Jacob (in the recited combinations) in view of Tamura, and Jacob (in the recited combinations) in view of Kono, render obvious this limitation.** *See* cl.1[h].

525. **Jacob discloses determining**[36] (*see* cl.1[h]) **a performance indicator** (*see* cl.1[h]) **in real time** (*see* cl.1[h])**, for each of the one or more participant channels** (*see* cl.1[c], [h]) **corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[d], [f], [h])**, based at least on the sale data corresponding to said one or more additional vendor computing devices** (*see* cl.1[g], [h])**.** *See* discussion of cl.1[h].

526. **Phillips discloses automatically/without the need for human intervention carrying out the revenue management process determining** (*see* cl.1[h]), **including based on sale data** (*see* cl.1[h]), **a performance indicator in real time** (*see* cl.1[h])**.** *See* discussion of cl.1[h]; *see also* cl.1[pre], [i].

[36] I understand that '047 does not require "automatic" performance of steps without human intervention. Rather, '047 expressly contemplates user input to its system. *E.g.*, EX1001, 5:11-14 ("vendors or an administrator… can set a rate of change"), 30:59-67 ("interface used by a vendor"), 31:54-60 ("interface to permit the Property to lock inventory"). To the extent "determining" "automatically" or without human intervention is required, Jacob discloses this limitation or Jacob (in the recited combinations) in view of Phillips, Tamura, or Kono renders this limitation obvious. *See also* cl.1[pre].

527. **Tamura discloses determining** (*see* cl.1[h]) **a performance indicator** (*see* cl.1[h]) **for each of the one or more participant channels** (*see* cl.1[c], [h]) **corresponding to the one or more active channel records** (*see* cl.1[d], [h]) **based on at least the sale data corresponding to one or more additional vendor computing devices** (*see* cl.1[a], [h])**.** *See* discussion of cl.1[h].

528. **Kono discloses determining** (*see* cl.1[g], [h]) **a performance indicator** (*see* cl.1[h]) **for each of the one or more participant channels** (*see* cl.1[c], [h]) **corresponding to the one or more active channel records** (*see* cl.1[d], [h])**.** *See* discussion of cl.1[h].

j. Element 4[i]

529. Claim 4[i] recites **"and for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, adjusting,**[37] **via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that meets a performance threshold." In my opinion, Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.1[i]. **Alternatively, Jacob (in the recited combinations) in view of Phillips, Jacob or Jacob-Phillips (in the recited combinations) in view**

[37] *See* n.24, 29; *see also* cl.1[h].

of Kono, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura, and Jacob or Jacob-Phillips (in the recited combinations in view of Tamura and Kono, render obvious this limitation. *See* cl.1[i].

530. In my opinion, **Jacob discloses for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[c]-[d], [f])**, adjusting** (*see* cl.1[i])**, via the channel interface** (*see* cl.1[a], [i])**, a price of the transportation service** (*see* cl.1[a], [i]) **by an adjustment factor** ("close the Rate Type… for a given date or series of dates, for certain channels"; *see* cl.1[i]) **if the performance indicator** (*see* cl.1[h], [i]) **indicates a performance that meets a performance threshold** ("sales channel's Room Type inventory is sold out or is selling better than other channels"; "day within the Rate Type active period is selling more quickly"; "days that might be selling out soonest"; *see* cl.1[g], [i])**.** *See* discussion of cl.1[i].

531. For example, Jacob expressly discloses performing a price adjustment by closing a "Rate Type" (*e.g.*, a discounted rate such as an "AAA® Rate" or a "corporate rate"), thus increase the price of sold on a particular sales channel: "***If a sales channel's Room Type inventory*** *is sold out or* ***is selling better than other channels***, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to ***close the Rate Type***/Room Type, for a given date or a series of dates, ***for certain channels***." *E.g.*, EX1004 (Jacob), ¶[0180].

532. Jacob also expressly discloses performing price adjustments if, *e.g.*, a particular day is selling more quickly than other days: "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." *E.g.*, EX1004 (Jacob), ¶[0176].

533. In addition, Jacob discloses the importance of communicating this updated pricing information to its sales channels: "The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" *E.g.*, EX1004 (Jacob), ¶[0185].

534. Jacob also discloses: "***A method of managing hotel pricing and inventory information comprising***: providing a database configured to manage hotel data; providing a first code segment configured to manage hotel data; providing a second code segment configured to manage user interaction; interacting with the

code segments by: (a) entering portal data; (b) entering property data; (c) entering room type data; (d) entering room hierarchy data; (e) entering rate type data; (f) entering date data; (g) communicating pricing and inventory information to a plurality of sales channels. ***(h) monitoring room inventory***; ***(i) adjusting prices in response to changes in room inventory***; (j) adjusting prices in response to date changes; ***(k) communicating pricing and inventory information to a plurality of sales channels***; (l) repeating steps (i) through (l) on a regular schedule." *E.g.*, EX1004 (Jacob), cl.13.

535. And, while Jacob discloses that a user of the system can decide to perform such a pricing adjustment (and instruct the system, including the computing device of the system, to perform the adjustment by storing updated pricing information/data and communication such information/data to sales channels), Jacob also discloses that its system comprises computer programs that are configured to "perform the methods/functions of the invention." For example: "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code

segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels**.** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input

from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." *E.g.*, EX1004 (Jacob), ¶[0082]; *see also* EX1004 (Jacob), ¶[0083] ("***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk."), [0078] ("As used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which manage data do so through their associated functions.").

536. As discussed below, POSITA would have thus understood that in addition to Jacob's users instructing the computing device to adjust inventory pricing, such adjusting can be performed automatically by Jacob's system (in the recited combinations) without user intervention. Indeed, Jacob discloses the

importance of a system that allows property administrators to "respond quickly to the dynamic nature of the marketplace, pricing and repricing inventory as necessary based upon changes in availability… with a minimum of data entry by the staff" and that an inventory management system should ensure that "sales channels would always be working with the most up-to-date pricing, availability, and other information." *E.g.*, EX1004 (Jacob), ¶[0005].

537. Consistent with this, Jacob discloses that the code segments of its system "perform calculations automatically" and "may be configured to automatically communicate" information to Jacob's sales channels. For example, Jacob discloses "Calculate the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." *E.g.*, EX1004 (Jacob), ¶[0131]; *see also* EX1004 (Jacob), ¶[0132] ("Automatically recalculate prices for associated Room Types in response to changes in the BAR rate. The ***code segment may be configured to perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click.").

538. Jacob discloses that its "computer program systems" include "code segments" such as "an analysis code segment, [and] a revenue enhancement code segment." For example: "***Embodiments of the present invention are computer***

program systems comprised of a series of code segments. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" *E.g.*, EX1004 (Jacob), ¶[0006].

539. Jacob also discloses that, *e.g.*, its communications code segments "communicate," *inter alia*, updated inventory and pricing information to sales channels. For example, "The communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions. ***Once the Rate Types, Room Types, and inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels.*** Other information communicated to the selling channels may

comprise add-on information, package information, amenity information, and facility information. ***The information is communicated to the selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click.*** As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such as the internet*** or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form." *E.g.*, EX1004 (Jacob), ¶[0191]; *see also* EX1004 (Jacob), ¶[0133] ("Communicate the prices to a plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or communicate in response to a user initiated triggering event***, such as a mouse click.").

540. Jacob further discloses "The system of claim 5 further comprising a code segment to ***automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***." *E.g.*, EX1004 (Jacob), cl.6; *see also* EX1004 (Jacob), cl.5 ("The system of claim 1

further comprising a code segment configured to ***communicate pricing information and inventory information to a plurality of sales channels***."), Figs.5-6 showing examples of "constraints" linking different room rates across room types and automatic cascading of updates to all rate types), Fig.7 (showing communication of "Rates & Availability" to each individual selling channel by, *e.g.*, Jacob's "RezTrip Application"), Fig.40 (showing "Change Allotment" function as to Rate Types in RezTrip application), Figs.41-43:

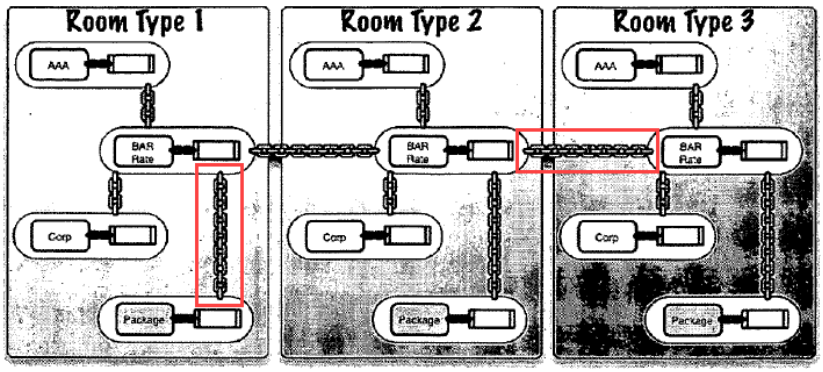


Figure 5

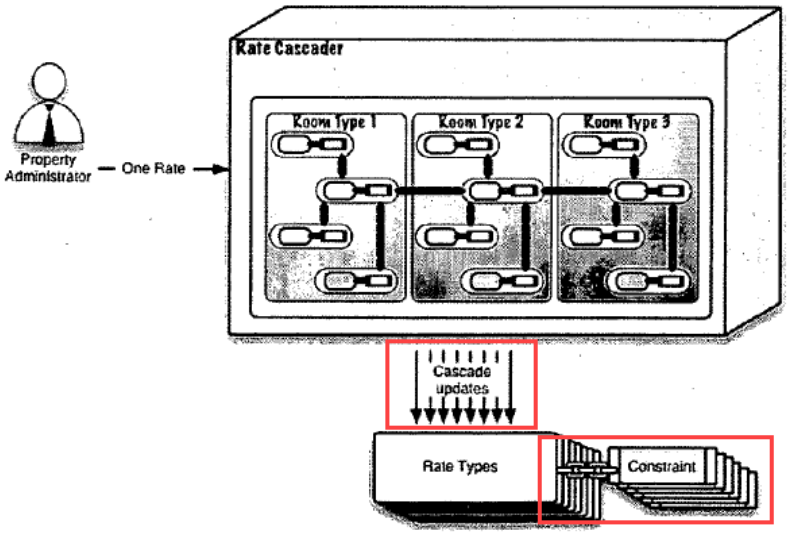


Figure 6

EX1004 (Jacob), Fig.6.

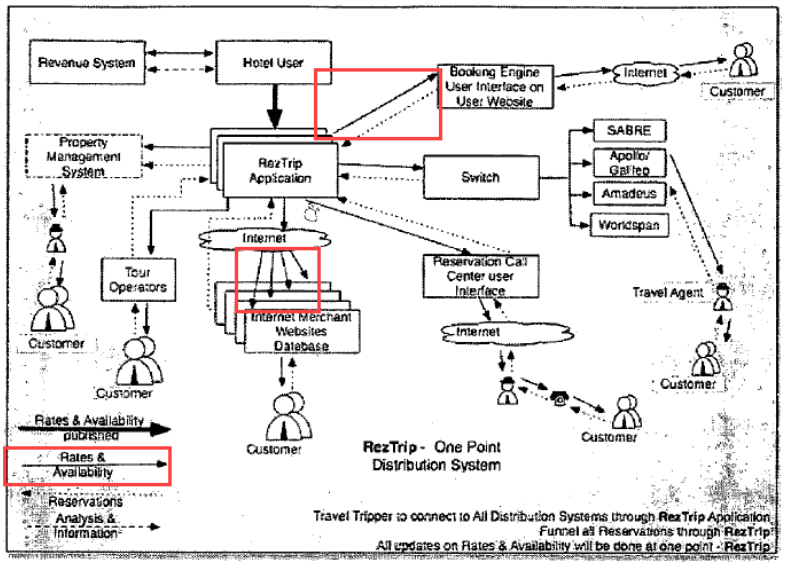


Figure 7

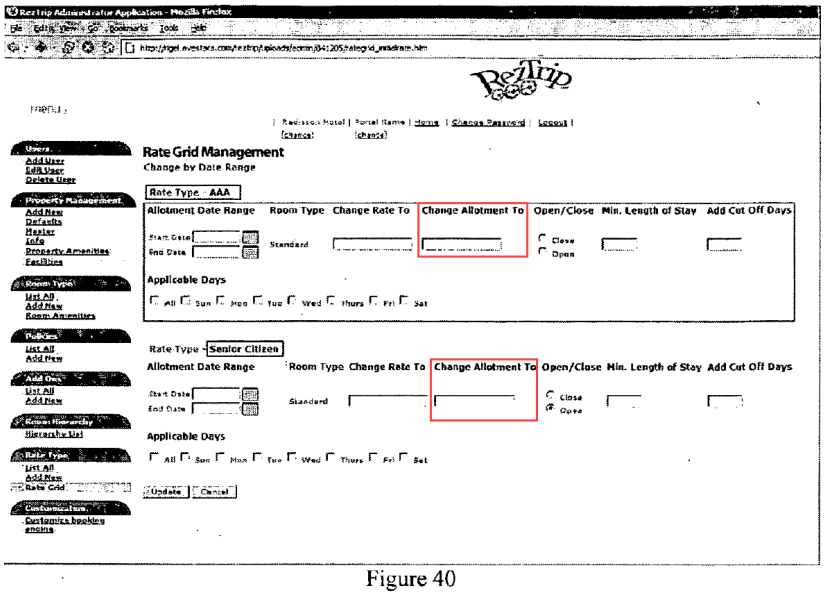


Figure 40

541. As discussed above with respect to cl.1[i], Jacob discloses for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold. *See* cl.1[i].

542. **Jacob further discloses adjusting, via the channel, interface, a price of the transportation service by an adjustment factor if the performance indicator *indicates a performance that meets a performance threshold.***

543. For example, Jacob expressly discloses performing a price adjustment by closing a "Rate Type" (*e.g.*, a discounted rate such as an "AAA® Rate" or a "corporate rate"), thus increase the price of sold on a particular sales channel: "***If a sales channel's Room Type inventory*** *is sold out or* ***is selling better than other***

channels, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to ***close the Rate Type***/Room Type, for a given date or a series of dates, ***for certain channels***." *E.g.*, EX1004 (Jacob), ¶[0180].

544. Jacob also expressly discloses performing price adjustments if, *e.g.*, a particular day is selling more quickly than other days: "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." *E.g.*, EX1004 (Jacob), ¶[0176].

545. As Jacob expressly discloses, POSITA would have understood pricing and inventory information sent to Jacob's sales channels as a result of, *e.g.*, an automatically initiated triggering event (initiated by the system), to include ***updated*** pricing and inventory information that has been adjusted or modified as part of Jacob's expressly disclosed "rate management process" (by *e.g.*, Jacob's users, or Jacob's code segments, such as Jacob's revenue management, analysis, and revenue enhancement code segments). *E.g.*, EX1004 (Jacob), ¶[0185]. Jacob also discloses

"computer program systems configured to manage the data and perform the methods/functions of the invention," including "code segments… configured to manage hotel data, and other time-dependent inventory data." *E.g.*, EX1004 (Jacob), ¶[0082]. Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose computers." *E.g.*, EX1004 (Jacob), ¶¶[0082], [0083]. Additionally, Jacob discloses (in addition to the possibility of a human administrator providing input (*e.g.*, EX1004 (Jacob), ¶[0180])) that "information is communicated to the selling channels in response to a triggering event. A triggering event may [be] initiated ***automatically*** by the system upon completion of a pricing update" (*e.g.*, EX1004 (Jacob), ¶[0191]), and "a code segment to ***automatically*** communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event" (EX1004 (Jacob), cl.6). *See also* EX1004 (Jacob), ¶¶[0131]-[0133] ("code segment may be configured to ***automatically*** communicate the prices and/or communicate in response to a user initiated triggering event"), cl.31; cl.1[pre]. Jacob further discloses an "analysis code segment" and a "revenue enhancement code segment," (*e.g.*, EX1004 (Jacob), ¶[0006]), and a "revenue management code segment used to analyze the information received from the sales channels… to maximize hotel revenue," *e.g.*, EX1004 (Jacob), ¶[0010].

546. In my opinion, **POSITA would have understood these disclosures to be an express disclosure—as an alternative to actions triggered by human input—of automatically "adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that meets a performance threshold"** (*e.g.*, "clos[ing] the Rate Type… for a given date or series of dates, for certain channels" if, *e.g.*, "sales channel's Room Type inventory is sold out or is selling better than other channels," and further discloses determining a "day within the Rate Type active period is selling more quickly"/"days that might be selling out soonest" (*see* cl.1[g], [i])) and communicating such adjustments to both the system's clients (*e.g.*, Properties) to beneficially make clients aware of such adjustment as well as to the sales channels.

547. Further, if it is argued further disclosure is required, as discussed in 1[pre], Jacob in view of Phillips (in the recited combinations) renders obvious carrying out all of Jacob's functions[38] (including, without limitation, adjusting, via the channel interface, a price of the transportation service by an adjustment factor if

[38] *See* n.27, *supra*.

the performance indicator indicates a performance that meets a performance threshold) ***automatically/without human intervention*** (as Phillips describes).

548. Additionally, POSITA would have further understood that Jacob provides examples of multiple sales channels, but that Jacob's disclosures would have applied to systems with two or more sales channels. And to POSITA, it would have been obvious from their understanding of basic economics (and optimization of net revenue) to upwardly "adjust" (*i.e.*, raise) a price or prices of items allocated to one or more distribution channels while also downwardly "adjusting" (*i.e.*, lowering) a price or prices of items allocated to one or more other distribution channels (known as "price differentiation") based on a performance indicator indicating a performance of a participant channel meets a performance threshold. *See, e.g.*, EX1029 (Phillips), 1 ("Price differentiation is a ***powerful way for sellers to improve profitability***"), 74 ("The term price discrimination is used in the economics literature to refer to much the same thing. We use the term price differentiation"), 76 ("Charging every customer exactly her willingness to pay is known as third-degree price discrimination in the economics literature"), 6 ("Channel pricing is the practice of selling the same product for different prices through different distribution channels"), 15 ("Tactics for price differentiation include … ***channel pricing***…."), 26 ("The ***goal of pricing and revenue optimization is to provide the right price • for every product*** • to every customer segment •

through every channel and to update those prices over time in response to changing market conditions"), 74 ("price differentiation" is "one of the most fundamental concepts in PRO [pricing and revenue optimization]"), 78 ("***sellers have a tremendous incentive to find creative ways to position and price their products differently*** to different market segments"), 99 ("the tactic of ***variable pricing*** *...* ***is used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***."), 101 ("the ***seller could use a combination of allocations and price rises*** to manage the shortage"), 136-37 ("expected net contribution… is the price (fare) minus the incremental cost," which "may vary by channel"). This would have beneficially increased the ability of the resulting system to respond more fulsomely to changing market conditions by adjusting prices of items allocated to different channels in different directions (*i.e.*, one (or more) upwardly and one (or more) downwardly) (by, *e.g.*, communicating such pricing updates both to the system's clients and to sales channels), again increasing the system's ability to respond, thereby furthering Jacob's express goal of "maximiz[ing] revenue." For POSITA it would have been routine to make such

an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success.[39]

[39] POSITA's reasonable expectation of success here and for all of the obviousness arguments herein is further confirmed by this technology's predictability. As discussed in §V, POSITA would have been well aware of all the hardware and software used in the combinations discussed herein, and adjusting a price of items allocated to distribution channels automatically based on sale data was well-known in the art. *E.g.*, EX1011 (Walker), 5:34-37 ("dynamically determine, adjust and manage product pricing"); EX1015 (Veit), 2:15-22 ("adjusting the initial price… based on the actual sales of the product"); EX1029 (Phillips), 126 ("At the heart of these [existing reservation] systems [by which "airlines and other travel companies manage their inventory"] are the booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not"), 30 ("In very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations."), 141 ("Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function. These departments rely on computerized systems to recommend actions

549. Additionally, in my opinion, **Phillips discloses automatically/without the need for human intervention** (*see* cl.1[pre], [i]) **adjusting the price of an inventory item up or down** (*see* cl.1[i])**.** *See* discussion of cl.1[i].

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based on sophisticated mathematical algorithms"), 101 (explaining that seller facing projected demand exceeding supply "could use a combination of allocations and price rises to manage the shortage"; "if he has segmented his market effectively, he could raise his average selling price by allocating most or all of the limited supply to higher-paying customers"), 80 (explaining "that customers arriving via different channels have different price sensitivities… Thus differential willingness to pay is also a motivation for channel pricing"); EX1026 (Choi), 2 ("One offers discounted rates to stimulate demand for inventory that would otherwise go unsold, but limits the availability of discounts to customers who are willing to pay a higher price…."; "Sophisticated revenue-management systems apply an inventory-allocation algorithm to make the best allocation decisions, which are then communicated to users in the form of restrictions on each rate-bucket level. Allocation decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions.").

550. To the extent it is argued that further disclosure of automatically "**adjusting**" by an adjustment factor based on the performance indicator indicating that a performance that meets a performance threshold is required, **it would have been obvious based Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura**.

551. Additionally, in my opinion, **Tamura discloses for each of the one or more participant channels corresponding to the one or more active channel records** (*see* cl.1[c]-[d], [i])**, adjusting** (*see* cl.1[i])**, via the channel interface** (*see* cl.1[a], [i])**, a price** (*see* cl.1[i]) **if the performance indicator** (*see* cl.1[h], [i]) **indicates a performance that meets a performance threshold** (*e.g.*, "favorable" to "sales volume target" (*e.g.*, channel has a "high" "sales progress relative to the allocated quantity"))**.** *See* discussion of cl.1[i].

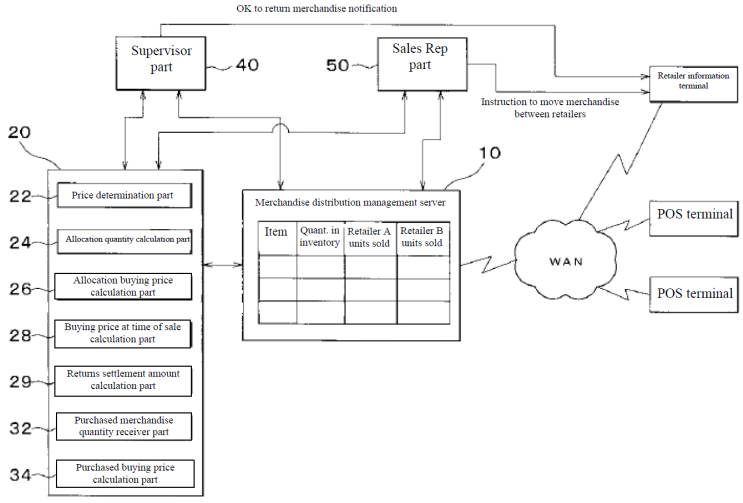
552. For example, Tamura discloses a "price determination part" that "determines a reference retail price" based on "the amount of inventory and the number of parts sold during the part period for each item sold" and further that the price determination is made ***with reference to the merchandise's distribution market***." As discussed below, POSITA would have understood that this is a disclosure of using Tamura's sales progress rate to determine whether a price adjustment should be made, and further that the price adjustment is made based on whether the performance indicator indicates a performance that meets a performance

threshold (*i.e.*, "with reference to the merchandise's distribution market"): "The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy***. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and with reference to the merchandise's distribution market." *E.g.*, EX1005 (Tamura), ¶[0019].

553. Tamura expressly discloses that the "price determination part," which sets this price, is part of Tamura's "sales management system": "Next, the ***price determination part 22 sets a reference retail price based on the inventory quantity of the item in question and the number of units sold during the unit period*** as stored in the merchandise distribution management server 10 (S102). The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the

retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based on the allocation buying price and the allocation quantity of the item." *E.g.*, EX1005 (Tamura), ¶[0025]; *see also* EX1005 (Tamura), cl.1 ("A sales management system comprising: ***a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale***, which is stored in a merchandise distribution management server; an allocated quantity calculation part that calculates the allocated quantity of the items for each retailer; an allocated stocking price calculation part that calculates the allocated stocking price for each retailer based on the allocated quantity of the item calculated by the allocated quantity calculation part; a time of sale stocking price calculation part that calculates the stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and a returned goods settlement amount calculation part that calculates the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity."), Figs.3:

Fig. 3



554. In addition, Tamura discloses "The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate." *E.g.*, EX1005 (Tamura), cl.4.

555. Tamura further discloses "The allocated buying price calculation part 26 calculates the allocated buying price to each retailer based on the allocation quantity of the item in question calculated by the allocation quantity calculation part 24. The allocated buying price is the price that the retailer should pay to the merchandise entity for the allocated merchandise provided by the merchandise entity when buying the merchandise. ***The allocated buying price is based on the reference***

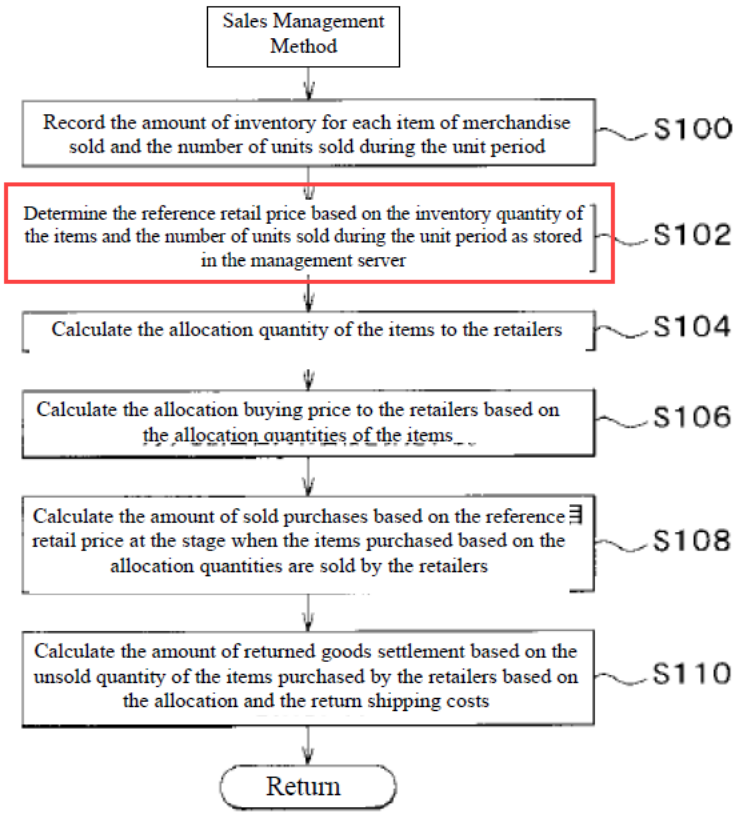
retail price in the price determination part 22, multiplied by a certain multiplying factor (e.g., 20% of the reference retail price) that covers procurement costs, such as the factory production price, plus logistics costs. The entity operating the retail store pays the allocated buying price to the merchandise planning entity within a certain period (e.g., within one month) from the time the goods are allocated and the allocated goods are delivered from the merchandise planning entity. From the perspective of the merchandise planning entity, the allocated buying price is in character a deposit for placing the allocated merchandise with the retailer." *E.g.*, EX1005 (Tamura), ¶[0021].

556. In addition, Tamura discloses that "The purchase price calculation part 28 calculates the sold purchase price based on the reference retail price at the stage when the relevant item purchased based on the allocation quantity is sold by the retailers. ***The sold buying price is determined according to the buying prices for the retailers at the point of sale by multiplying a certain multiplying factor (e.g., 60% of the reference retail price) based on the reference retail price in the price determination part 22.*** The sold buying price is linked to the reference retail price, which is determined flexibly by the price determination part 22 and differs from the allocated buying price by the amount of the change between the reference retail price and the multiplying factor. Therefore, the retailer determines the purchase price of the allocated merchandise from the merchandise entity by multiplying the allocated

merchandise from the merchandise entity by the sold purchase price." *E.g.*, EX1005 (Tamura), ¶[0022].

557. Tamura also discloses that its "merchandise distribution management server" "determines the reference retail price": "The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step***: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100); a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." *E.g.*, EX1005 (Tamura), ¶[0014]; *see also* EX1005 (Tamura), Fig.2:

Fig. 2



558. As discussed above with respect to cl.1[i], Tamura discloses for each of the one or more participant channels corresponding to the one or more active channel records, adjusting, via the channel interface, a price if the performance indicator indicates a performance that fails to meet a performance threshold. *See* cl.1[i].

559. **Tamura further discloses adjusting, via the channel interface, a price by an adjustment factor if the performance *indicates a performance that meets a performance threshold*.**

560. For example, Tamura discloses "The price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. ***For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price***, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and with reference to the merchandise's distribution market." *E.g.*, EX1005 (Tamura), ¶[0019].

561. As discussed, both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004 (Jacob), ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. As also discussed, Jacob discloses "computer program systems configured

to manage the data and perform the methods/functions of the invention" and "code segments form a code segment configured to manage hotel data, and other time-dependent inventory data." *E.g.*, EX1004 (Jacob), ¶[0082]; *see also* EX1004 (Jacob), ¶[0005] (update prices with "minimum of data entry by the staff"). Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose computers." EX1004 (Jacob), ¶¶[0082], [0083]; *see also* EX1004 (Jacob), ¶¶[0131]-[0133], [0191]. Tamura expressly discloses "a merchandise distribution management server 10 that executes each step" (*e.g.*, EX1005 (Tamura), ¶[0014]), "a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale," and "announc[ing] to retailers… the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise," which POSITA would have understood is the sales progress rate, and "with reference to the merchandise's distribution market," which POSITA would have understood discloses adjusting based on sale data corresponding to at least one or more additional vendor computing devices (*see* cl.1[g]). *E.g.*, EX1005 (Tamura), cl.1; *see also* EX1005 (Tamura), ¶[0019] ("the price determination part 22 takes a strong attitude toward the reference retail price"

or "takes a weak attitude toward the reference retail price or plans a sales promotion strategy"), [0025], Fig.3).

562. In my opinion, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's or Jacob-Phillips's inventory management and distribution system (in the recited combinations) (including Jacob's disclosure of "analyzing the information received from *the* sales channels," closing a Rate Type for a given date or series of dates, for certain channels, and storing such updated pricing information) using Tamura's beneficial teachings of automatically adjusting a price of items if performance meets a performance threshold, such that in the resulting system the adjusting occurs automatically without the need for a user of the combined system to instruct the system to perform such adjustment and the updated price information is communicated to both the system's clients (*e.g.*, Properties) and the sales channels.** To the extent it is argued that automatically adjusting by an adjustment factor based on the performance indicator indicating that a performance that meets a performance threshold is required and is not disclosed by Jacob or rendered obvious by Jacob-Phillips, this would have beneficially furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, reducing the response time/increasing the speed of the system (by reducing the

need to wait for and address user intervention) and by increasing the ability of the system to take into account the result of processing sale data from multiple distribution channels in determining whether/how to adjust a price of items, thereby allowing the system to more quickly and effectively address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004 (Jacob), ¶[0002]; *see also* EX1004 (Jacob), ¶[0005] ("The system should allow the administrator to change the pricing of all items based upon…any… factor affecting price, with a minimum of data entry by the staff")). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029 (Phillips)[40] (discussing existing systems automatically adjusting price and channel allocations for inventory including transportation services – *e.g.* at 30 ("In very rapidly changing environments such as the passenger

[40] To the extent it is argued that further disclosure of adjusting , via the channel interface, a price of the transportation service by an adjustment factor is required, this would have been obvious by the disclosures of Phillips (which is already part of the recited combinations) for the same reasons as those set forth above.

airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations."), 123 ("For ***airlines, hotels, rental car companies, and cruise lines, booking control is a function of the reservation system. Tactical revenue management is the "brains"*** of the process. It is where ***future demand is forecast, optimization algorithms run, and booking limits set and updated***. We first discuss the strategy of revenue management and how it applies in different industries. We then turn to a somewhat detailed discussion of ***booking control—the "real-time" face of revenue management***."; "Once products and prices have been established, **revenue management tactics require setting and updating limits on how much of a particular product can be sold at a particular fare to each segment for some period of time**—say, a day or a week. ***Booking control*** **is the moment-to-moment determination of which booking requests should be accepted and which should be rejected**." (italics in this last quote are original)), 131 ("The job of ***tactical revenue management*** is to ***calculate and periodically update booking limits***. These booking limits are transmitted to the reservation system, which then uses them to determine which booking requests to accept and which to reject based on the logic described in Section 6.5. To introduce the tactical revenue management problem in its most general form, it is useful to define resources, products, and fare classes. • Resources are units of capacity managed by a supplier. Examples of resources are a flight departure, a hotel room

night, and a rental car day. Each resource is constrained—the flight departure has a limited number of seats, the hotel only has a limited number of rooms it can sell, and a rental car company has only so many cars it can rent out on a particular day. • Products are what customers seek to purchase. A product may require use of one or more resources. A seat on Flight 130 from St. Louis to Cleveland on Monday, June 30, is a product that uses only a single resource. A two-night stay at the Sheraton Cleveland for a customer arriving on March 19 and departing on March 21 is a product that uses two resources: a room night on March 19 and a room night on March 20. • There are one or more ***fare classes*** associated with each product. ***Each fare class is a combination of a price and a set of restrictions on who can purchase*** the product and when. As discussed in Section 6.3, different fare classes can be used to establish different virtual products, for group pricing, for regional pricing, or for combinations of all of these."), 133 ("the company needs to determine ***how many units to sell at the lower price(s) and how many to reserve for sale at a higher price***."), 134 ("6.6.2 Revenue Management Systems[:] The primary job of a revenue management system is to ***calculate and update the booking limits within the reservation system***. Typically a revenue management system is separate from the reservation system but linked to it, as shown in Figure 6.3. The revenue management system receives a feed of bookings and cancellations from the reservation system and, in turn, calculates booking limits that are transmitted periodically to the

reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems."), 99 ("the tactic of ***variable pricing***… is ***used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***."), 106-07 ("a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity"), 112-13 ("***Passenger airlines*** certainly meet the criteria for ***variable pricing***—constrained capacity with demand that fluctuates over time. ***Southwest Airlines implements variable pricing directly by changing fares for their departures in order to match demand with the restricted capacity***. However, the major "***nondiscount" airlines also practice variable pricing. They do so by opening and closing the availability of various fare classes on different flights***.… In this case, the airline is adjusting the average fare not by changing the list price but by opening and closing fare classes. When total demand is anticipated to be high, the airline will restrict availability of discount fares, causing the average fare to increase. When total demand is anticipated to be low, the airline will open availability of deep discounts, causing the average fare to drop. It is continually monitoring demand using its revenue management system to determine which classes to open and close on each flight. We describe how this is done in some detail in Chapters 6 and 7. [¶] Discount airlines use variable pricing even more directly. ***If demand at Southwest Airlines begins to***

rise more quickly or more slowly than anticipated, Southwest may change the price. Southwest does not attempt to use prices to segment customers between "high-elasticity" and "low-elasticity" segments—rather, it is using variable pricing without segmentation to maximize the return from each flight and, to some extent, to smooth demand through demand diversion from high-fare/high-utilization flights to low-fare/low-utilization flights."), 120 ("the techniques can be ***applied to any situation in which a seller needs to determine how to allocate a fixed supply among different channels or customer segments paying different prices***"), 79 ("4.3.2 Channel Pricing[:] ***Channel pricing is the practice of selling the same product for different prices through different distribution channels***. Here are some examples. • Barnes and Noble sells books for different prices online than through its outlets. • Special "Web-only" fares for airline tickets are available through the Internet but not through travel agencies. • Many fashion and home furnishing merchants offer lower prices for merchandise through mail-order catalogs than for the same merchandise sold through retail outlets. [¶] As with other price differentiation schemes, there can be more than one reason why a seller might charge different prices through different channels. One is cost—for many companies, selling through the Internet is cheaper than selling through traditional channels. Continental Airlines calculated that distribution costs for a $325 ticket are about $43 when the ticket is sold through a travel agent versus only $18 when the same ticket is sold through Continental's Web

site. This difference in itself would be sufficient reason for Continental to charge lower prices on its Web site."), 80 ("However, it is also the case that ***customers arriving via different channels have different price sensitivities***. For personal loans, it has been shown that *customers inquiring through the Internet* are more price sensitive than those contacting a call center, who are in turn more price sensitive than those who apply for a loan at a retail branch. Furthermore, ***Internet customers who access a consolidator Web site or use a shopping 'bot tend to be more price sensitive than those who go directly to a bank's Web site***. This is not surprising given the characteristics of the channels—it is generally easier and more convenient to shop and compare prices during a single Internet session than by making many phone calls. Thus differential willingness to pay is also a motivation for channel pricing."), 124 ("**Airlines are also enthusiastic channel pricers**; ticket prices on the Internet are often cheaper than through travel agents. Other revenue management companies followed the airlines in segmenting their market, creating virtual products and establishing a wide range of prices. **Hotels and rental car companies** establish and manage products and different prices oriented toward various groups: corporate, leisure, and business segments."), 101 ("the seller could use a ***combination of allocations and price rises to manage the shortage***"), 31 ("A number of pricing execution or 'pricing management' vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that complex pricing changes are

correctly and efficiently transmitted through all channels"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE and Worldspan.[] Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines"), 170 ("***Periodically recalculate all booking limits based on total bookings and demand expected in each class*** until departure. (This recalculation is often called a *reoptimization*.) This dynamic booking control process makes no assumption about the nature of the reoptimization approach being used or the frequency with which reoptimizations occur. And, in fact, there is considerable variation among companies in the optimization approaches used and the frequency and situations under which they are applied. ***There is a general belief that frequent reoptimization is important – particularly when demand is changing rapidly or departure is approaching and bookings and cancellations are being received at a high rate***. Often, the tradeoff is between using a more complex algorithm and reoptimizing less often and using a simpler algorithm and reoptimizing more often. These issues are the topics of ongoing research and are by no means settled."), 264 ("All of the pricing tactics we have studied so far assume that buyers and sellers interact in the same basic fashion. The seller offers a stock of goods to different customer segments through different channels. Potential customers arrive, observe a price, and decide whether or not to purchase. **The seller needs to decide what**

price to offer for each product to each customer group through each channel. The seller monitors sales of his goods and periodically updates the prices and/or availabilities he is offering. This is the *list pricing* model…." (italics original)); EX1026 (Choi), 2 ("One offers discounted rates to stimulate demand for inventory that would otherwise go unsold, but limits the availability of discounts to customers who are willing to pay a higher price…."; "Sophisticated revenue-management systems apply an inventory-allocation algorithm to make the best allocation decisions, which are then communicated to users in the form of restrictions on each rate-bucket level. Allocation decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions.").

563. In addition, Tamura expressly discloses two sales channels ("Retailer A" and "Retailer B"). As such, POSITA would have understood that although Jacob provides examples of multiple sales channels, the disclosures of the combined systems (including adjusting a price of inventory items would have applied to a system with two sales channels, in addition to a system with more.

564. Thus, in my opinion, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura renders obvious this limitation.

565. As discussed above with respect to cls.1[g]-[h], Jacob or Jacob-Phillips (in the recited combinations) in view of Kono renders obvious receiving sale data

for one or more participant channels (*see* cl.1[g]) corresponding to the one or more active channel records (*see* cl.1[d]). And as discussed immediately above, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura renders obvious automatically "**adjusting**" a price of the transportation service based on a performance that meets a performance threshold. **It would have been obvious, straightforward, and advantageous to implement Jacob in view of Kono or Jacob-Phillips in view of Kono (in the recited combinations, including Jacob's code segments) using Tamura's additional teaching of automatically adjusting a price of inventory items based on a performance indicator indicating that a performance that meets a performance threshold. As discussed, both Tamura and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand.** *E.g.*, EX1005 (Tamura), ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; EX1007 (Kono), Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Implementing the combined system (including the recited Kono combinations) using Tamura's beneficial teaching of automatically adjusting a price of inventory items based on a performance that meets a performance threshold would have beneficially furthered Jacob's express goal of

"maximiz[ing] revenue" of Jacob's "time-dependent inventory," Tamura's express goals of "reducing lost sales opportunities," and Kono's express goal of reducing "unnecessary inventory on the market" by, *e.g.*, allowing the system to more quickly address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory (and communicating such adjustment to both the system's clients (*e.g.*, Properties) and the sales channels), thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004 (Jacob), ¶[0002]; *see also* EX1004 (Jacob), ¶[0005] ("minimum of data entry by the staff")) and "reducing lost sales opportunities" (EX1005 (Tamura), ¶[0001]). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with a reasonable expectation of success. *See*, *e.g.*, EX1029[41] (Phillips) (discussing existing systems automatically adjusting price and channel allocations for inventory including transportation services); EX1026 (Choi) (same for hotel inventory) (*see* citations in cl.1[i], above).

* * *

566. Thus, in my opinion, (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view

[41] *See* n.32, *supra*.

of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono render obvious this claim.

12. Claim 5 is Rendered Obvious By (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

567. As discussed above, claim 4, from which claim 5 depends, is rendered obvious by (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of

Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono. *See* cl.4, cl.1. In my opinion, **claim 5 rendered obvious over (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.** *See infra*, p.778.

568. Claim 5 recites **"The computer-implemented method of claim 4, wherein the processing the sale data comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel." In my opinion Jacob (in the recited combinations) discloses or at minimum renders obvious this limitation.** *See* cl.2. **Alternatively, Jacob (in the recited combinations) in view of Kono renders obvious this limitation.** *See* cl.2.

569. **Jacob discloses processing the sale data** (*see* cl.2; *see* cl.1[g], [h]) **comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel** (*see* cl.2)**.** *See* discussion of cl.2.

570. **Kono discloses processing the sale data** (*see* cl.2; *see* cl.1[g], [h]) **comprises determining whether or not a supply of exceeds demand or vice versa per distribution channel** (*see* cl.2)**.** *See* discussion of cl.2.

13. Claim 6 is Rendered Obvious By (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

571. As discussed above, claim 4, from which claim 6 depends, is rendered obvious by (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of

Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono. *See* cl.4, cl.1. In my opinion, **claim 19 is rendered obvious over (a) Jacob in view of Phillips, (b) Jacob in view of Phillips and Evangelist, (c) Jacob in view of Phillips and Franklin, (d) Jacob in view of Phillips, Evangelist, and Franklin, (e) Jacob in view of Phillips and Tamura, (f) Jacob in view of Phillips, Evangelist, and Tamura, (g) Jacob in view of Phillips, Franklin, and Tamura, (h) Jacob in view of Phillips, Evangelist, Franklin, and Tamura, (i) Jacob in view of Phillips, Tamura, and Kono, (j) Jacob in view of Phillips, Evangelist, Tamura and Kono, (k) Jacob in view of Phillips, Franklin, Tamura, and Kono, and (l) Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.** *See infra*, p.778.

572. Claim 6 recites **"The computer-implemented method of claim 4, wherein the one or more active channel records are linked to the channel interface without the one or more inactive channel records." In my opinion, Jacob (in the recited combinations) in view of Phillips discloses or at minimum renders obvious this limitation.** *See* cl.3.

573. **Jacob discloses active channel records are linked to the channel interface** (*see* cl.1[a], [d], [f], cl.3)**.** *See* discussion of cl.3.

574. **Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive** (*see* cl.1[e], cl.3)**.** *See* discussion of cl.3.

VIII. SECONDARY CONSIDERATIONS

575. At this time, including after review of the documents and materials cited herein as well as those identified in Appendix B attached to this declaration, there is no evidence of secondary considerations or objective factors of non-obviousness with a nexus to the '047 patent, and it is my opinion that claims 1-6 of the '047 patent are obvious over the prior art. I understand that if the Patent Owner presents evidence of objective factors that it argues support a finding of non-obviousness, I may be asked to review such evidence and to formulate an opinion and reserve the right to address any such evidence and/or arguments that Patent Owner may raise in this regard.

IX. CONCLUSION

576. In summary, I have concluded that each of the Challenged Claims is invalid as obvious under 35 U.S.C. § 103 in light of the prior art references as discussed above and the knowledge of one of ordinary skill in the art, as described above and in Appendix C attached to this declaration.

577. Specifically, it is my opinion that **Ground 1**: Claims 1-6 Are Obvious Over Jacob in view of Phillips; **Ground 2**: Claims 1-6 Are Obvious Over Jacob in

view of Phillips and Evangelist; **Ground 3**: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Franklin; **Ground 4**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, and Franklin; **Ground 5**: Claims 1-6 Are Obvious Over Jacob in view of Phillips and Tamura; **Ground 6**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, and Tamura; **Ground 7**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Franklin, and Tamura; **Ground 8**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Franklin, and Tamura; **Ground 9**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Tamura, and Kono; **Ground 10**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Tamura, and Kono; **Ground 11**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Franklin, Tamura, and Kono; **Ground 12**: Claims 1-6 Are Obvious Over Jacob in view of Phillips, Evangelist, Franklin, Tamura, and Kono.

578. To the extent it is argued that any further disclosure is required for a limitation in claims 1-6 that I have identified above as having been disclosed (explicitly or inherently) by references listed in Appendix B, POSITA would certainly have found that limitation obvious to include based on the same explicit disclosure or inherent disclosures and analysis I have identified above.

579. I reserve the right to supplement my opinions in the future to respond to any arguments that Patent Owner or its expert(s) may raise and to take into account new information as it becomes available to me.

580. I declare under penalty of perjury of the laws of the United States of America that the foregoing is true and correct. I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both. I make this declaration of my own personal knowledge, and all statements are true. If called to testify as to the truth of the matters stated herein, I could and would testify competently.

Sworn to this 7th day of April, 2023 in Seattle, Washington.



Amelia Regan, PhD

APPENDIX A (C.V., List of Publications, List of Testifying Experience)

Amelia C. Regan
202D Wilson Ceramic Laboratory
University of Washington, Seattle
(949) 228-8626 (cell)
Aregan8@UW.edu
Spring, 2023

Education

University of Texas at Austin, MSE, Ph.D. (Civil Engineering) 1995, 1997
The Johns Hopkins University, MS (Applied Mathematics) 1990
University of Pennsylvania, BAS (Systems Engineering) 1987

Experience

University of Washington, Seattle

Director, MS in Supply Chain Transportation and Logistics, August 2022- Present
Associate Teaching Professor Department of Civil and Environmental Engineering, August 2022-Present

Primary Research Interests

Combinatorial Optimization, Warehouse Automation, Autonomous Vehicles for Freight Operations (on-road and facility based), Pedestrian Safety and Security, Sustainable Transport (Freight and Passenger), Labor Issues in Freight and Delivery Services, Machine Learning Tools for Temporal-Spatial Data Analysis and for Improving Air Cargo Operations

Primary Teaching Interests

Introduction to Supply Chain Transportation and Logistics
Sustainable Freight Transportation and Logistics
Automation in Freight Transportation and Logistics

Service

CEE Graduate Advisor Hiring Committee, August 2022
NSF Career Panel, Fall, 2022
TRB Special Committee on Best Practices for the Efficient Supply of Chassis for Transporting Intermodal Containers, December 2022-April 2024

Courses Taught

Introduction to Supply Chain Transportation and Logistics, Fall 2022
Freight Transportation, Winter 2023

University of California, Irvine

Professor Emeritus of Computer Science and Transportation Systems Engineering June 2022- Present
Professor of Computer Science, July 2009 – June 2022
Professor of Civil Engineering (courtesy), July 2009 – June 2022
Faculty Director, Master of Computer Science Program, 2015- 2018
Faculty Director, MS and PhD Programs in Transportation Science (Interdisciplinary Program) 2016- 2018

Associate Professor of Computer Science, July 2003 – June 2009
Associate Professor of Civil Engineering, July 2002 – June 2009
Associate Professor (Courtesy) Graduate School of Management, July 2002 –June 2005

Assistant Professor of Civil Engineering, March 1997-June 2002

Assistant Professor (Courtesy) Graduate School of Management, July 2001 – June 2002

Associate Dean, Bren School of Information and Computer Science, July 2006-June 2009
Acting Associate Dean, Bren School of Information and Computer Science, July 2005-December 2005
Acting Associate Dean, UCI, Division of Undergraduate Education, July 2003 - December 2003

Funded Research Projects (PI unless noted)

Dynamic Dispatching, Load Acceptance and Pricing Strategies for Carrier Fleet Operations: Potential for Improved Freight Mobility. Sponsor: University of California Transportation Center August 1997-July 1998

Assessment of the Perceptions of California Fleet Operators Regarding Transportation Problems, Expectations and Solutions (with Tom Golob, Institute of Transportation Studies). Sponsor: University of California Transportation Center August 1997-July 1998

Implementable dynamic dispatching algorithms for carrier fleet operations: Demand responsive service for standard ground and Intermodal freight movements Sponsor: Transportation Research Board ITS-IDEA, August 1998-July 1999

On-line Algorithms for dynamic dispatching of commercial vehicle operations (with Sandra Irani, Department of Information and Computer Science) Sponsor: University of California Transportation Center, September 1998-August 1999

Analysis and Development of Tools to Support Intermodal Operations. Sponsor: JBHunt Transportation Inc./The Logistics Institute January 1999-January 2001 (two separate awards made)

Dynamic Freight and Fleet Management: Modeling, Algorithm Development and Implementation. Sponsor: NSF CAREER Award, July, 1999- June, 2003

Impacts of Shipping Changes on the Efficiency of the Freight Transportation Network (with Tom Golob) Sponsor: University of California Transportation Center, September 1999-August 2000

Online verses Rolling Horizon Algorithms for Dynamic Service Fleet Operations (with Sandy Irani) Sponsor: University of California Transportation Center, September 1999-August 2000

Deployment Paths of ATIS: Impact on Commercial Vehicle Operations, Private Sector Providers, the Public Sector Role Sponsor: California Partners for Advanced Transportation and Highways (PATH), July 2000 - June 2001

E-commerce and the efficiency of the California freight network: Perspectives of shippers, carriers and third party logistics and information services providers (with Tom Golob) Sponsor: University of California Transportation Center, July 2000-June 2001

Inventory theoretic models of freight demand: Revisiting the past in light of the new economy Sponsor: University of California Transportation Center, July 2000-June 2001

Dynamic and Stochastic Vehicle Dispatching with Time Dependent Travel Times: The Next Generation of Algorithms Sponsor: National Science Foundation/US Department of Transportation, January 2002-December 2002

Policies for Safer and More Efficient Truck Operations on Urban Freeways Sponsor: University of California Transportation Center, Jan 2003-December 2003

Shifting Trucks from Roads to Rails in the Ports of LA/Long Beach: Feasibility and Emissions Impacts, Caltrans (subcontract to UC Davis), July 2003-June 2004

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Combinatorial Auctions for Freight Transportation Contract Procurement, Sponsor: University of California Transportation Center, October 2003 – September 2004

Modeling Matched Traffic and Accident Datasets to Significantly Improve Safety and Efficiency of Urban Freeway Operations, Sponsor: National Science Foundation/US Department of Transportation, September, 2003-March 2005.

Shifting Trucks from Roads to Rails in the Ports of LA/Long Beach: Feasibility and Emissions Impacts, Caltrans (subcontract to UC Davis), July 2003-June 2004

ITS Solutions to I-710 Corridor Challenges, Sponsor: California Partners for Advanced Transportation and Highways (PATH), April 2004 - August 2004

Capacity Modeling for Large Scale Multimodal Transportation Systems, Sponsor: University of California Transportation Center

An evaluation of California's chassis network Sponsor: California Partners for Advanced Transportation and Highways (PATH), April 2004 - August 2004

Models for Evaluating General Truck Transportation Management Strategies Sponsor: California Partners for Advanced Transportation and Highways (PATH), September 2004 - August 2005

Real Option-based Procurement for Transportation Services Sponsor: University of California Transportation Center, January 2008 – September 2008

American Indian Summer Institute in Computer Science, Sponsor, NSF, (Co-PI), July 2007-July 2011

Freight Data Collection and Analysis Sponsor: Caltrans, January 2008 – March 2010

Large Scale Real Options Models for Network Investment Planning and
Operational Risk Hedging, Sponsor: University of California Transportation Center, September 2008 – August 2009

Dynamic Lane Sharing (with Lead campus UCB and UCD), Sponsor University of California MPRI, January 2010-August 2012

Implementable Models for Efficient Transportation Systems Management: Breaking through the Computing Barrier, Sponsor: University of California Transportation Center, September 2012 – June 2014

Innovate From the Start: Engaging Engineering and Computer Science Undergraduates: Sponsor: NSF (Co-PI), October 1, 2014- September 31, 2018

UCOP Grant to develop an on-line upper division writing class, September 2016-August 2017

Enabling Paratransit and TNC Services with Blockchain Based Smart Contracts Sponsor: Pacific Southwest Region University Transportation Center, Jan 2019-June 2020

The Impacts of Covid-19 on Transportation Gig Workers, Sponsor: Pacific Southwest Region University Transportation Center, August 2020-July 2021

Courses Taught

Graduate

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Capstone Writing and Professional Communication (MCS)
Seminar on Parallel Metaheuristics for Combinatorial Optimization
Analysis of Algorithms
Introduction to Optimization
Transportation Logistics I: Introduction to Logistics and Supply-Chain Management
Transportation Logistics II: Distribution Systems Modeling
Transportation Logistics III: Location and Location/Routing
Advanced Transportation Systems Analysis: Introduction to Mathematical Programming
Stochastic Modeling and Simulation
Transportation Engineering Seminar
Transportation Economics Seminar

Undergraduate

Seminar on Parallel Metaheuristics for Combinatorial Optimization
Critical Writing about Technology
Graph Algorithms
Network Optimization
Boolean Algebra and Logic
Systems Analysis and Technical Communication
Engineering Ethics, Technology Impacts and Effective Communication
How Computers Work
Civil & Environmental Engineering Methods I: Problem Solving and Computation
Civil & Environmental Engineering Methods II: Probability and Statistics
Civil & Environmental Engineering Methods IV: Introduction to Operations Research
Problem Solving Through Recreational Mathematics (Freshman Seminar)
The Art of Quick and Accurate Calculation (Freshman Seminar)
Information Technology in the Popular Press (Freshman Seminar)
Undergraduate Independent Study in Logistics and Supply Chain Management
Undergraduate Independent Study in Computing in Civil Engineering
Undergraduate Independent Study in Optimization Modeling
Undergraduate Independent Study in Distributed Computing for Combinatorial Optimization Problems

Other

What are the chances of that? Probability in everyday life. A seminar presented to junior high and high school teachers as part of the UCI-Santa Ana Teachers institute
Everyday applications of statistics A seminar presented to junior high and high school teachers as part of the UCI-Santa Ana Teachers institute
What are the chances? Probability, Computing and Simulation. A course presented in the UCI COSMOS program (California State Summer School in Math and Science).
Introduction to Simulation Modeling A course presented in the UCI COSMOS program
Discrete Mathematics for Computer Science. A course presented in the UCI COSMOS program
The Magic of Discrete Mathematics A course presented in the UCI COSMOS program

Graduate Student Supervision

MS Students

Sreeram Jagannathan (MS, September 1999)
Thesis: Analysis of dynamic dispatching heuristics for carrier fleet operations in a GIS framework
Fenghuan Wang (MS, September 2000)
Barbara McGahey (MS, September 2001)
Srinivas Nandiraju (MS September 2002)

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Thesis: Examination of Alternative Cutting Plane Methods for Integer Programming Problems with Binary Variables

Sankar Janakiraman(MS June 2002)
Thesis: Empirical Examination of Alternative Assignment models for Time Constrained Local Fleet Assignment in which Service and Travel Times are Stochastic

Kyra Tao (MS, June, 2005)
Thesis: Diverting Trucks to Rail: The Southern California Case Study

Karou Sperry (MS, September 2005)
Thesis: Data Mining for improved understanding of Truck Involved Accidents

Marcel Lopez (MS, Summer, 2007)
Thesis: Teaching basic optimization algorithms using graphical calculators

Maury Gridley (MS, Fall 2011)
Thesis: The use of Stochastic Local Search for Solving Combinatorial Auctions

Arun Balagopalan (MS, Winter, 2012)
Thesis: Improving Topic Reproducibility in Topic Models

Ali Mehrabi Davoodabadi (MS Summer, 2012)
Topic: On-Line Secretary Problems and their Variants

Ross Wagner (MS Spring, 2013)
Topic: Parallel Metaheuristics on GPUs for Precedence Constrained Traveling Salesman Problems

Karina Hermawan (MS, Spring, 2016)
Topic: Fatal Accidents and Passenger Mortality Risks: Measuring Recent Air Travel Safety Across Countries

Runyi Wang (MS, Spring 2017)
Topic: Estimating the supply and demand mismatch for a large transportation management company using machine learning.

Boyian Jiang (MSCEE, Fall 2020)
Topic: Missing data in Machine Learning Models of short term Traffic Flows

Boyian Jiang (MSCS, Fall 2021)
Topic: New Missing data in Machine Learning Models of short term Traffic Flows

Dozens of MS papers and final projects supervised in Computer Science, Transportation Science and Civil Engineering.

PhD Students Graduated

Xiubin Wang (Ph.D, December 2000), Professor of Civil Engineering, Texas A&M University
Dissertation: Dynamic and stochastic carrier fleet management: Application to local truckload trucking operations

Xiangwen Lu (Ph.D, September, 2001), Formerly Assistant Professor, Industrial Engineering and Operations Research, Hong Kong University of Science and Technology, currently Business Analyst, Cisco, Bay Area, California
Dissertation: Dynamic and Stochastic Routing Optimization: Algorithm Development and Performance Analysis

Paul Forster, (PhD, Summer 2002), Associate Professor, Hong Kong University of Science and Technology
Sadly, Paul's life was cut short by a sudden illness in December 2020.
Dissertation: Information Technology Adoption and Use in US Scheduled Air Cargo Forwarders and Airlines

Jiongjiong (John) Song (PhD, June 2003), Vice President, AECOM, Austin Texas
Dissertation: Optimal strategies in combinatorial auctions: The case of freight transportation contracting

Minyoung Park (PhD, December, 2005), Dean and Professor, Inha University, South Korea

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Dissertation: Capacity analysis for large scale freight transportation systems

Srinivas Nandiraju (PhD, March, 2006), Senior Leader, Supply Chain Optimization and Data Science, Apple
Dissertation: Optimal contracting for freight transportation services

Choong Heon Yang (PhD, March, 2008), Senior Researcher, Korea Institute of Civil Engineering and Building Technology
Dissertation Research: Multi-Criteria Decision Making for Prioritizing Potential Alternative Truck Management Strategies

Pruttipong (Palm) Apivatanagul (PhD, Fall 2008), Logistics Management Consultant, Thailand.
Dissertation Research: Network Design Formulations, Modeling, and Solution Algorithms for Strategic Planning Long Haul Freight Movements

Jiana-Fu (Jeff) Wang (PhD, Fall, 2008) Associate Professor, National Chung Hsing University, Taiwan
Dissertation Research: Optimization of large scale cross docking operations

Mei-Ting (May) Tsai (PhD, Fall, 2009) Associate Professor, National Chung Hsing University, Taiwan
Dissertation Research: A real-options approach to freight transportation derivatives contract development

Joseph Chow (PhD March, 2010), Associate Professor, New York University
Dissertation Research: Network Design Under Uncertainty using a Real Options Approach

Rex Chen (PhD Fall, 2010), 5G Evangelist, Venture Capital Investor
Dissertation Research: Broadcasting in Vehicular Ad Hoc Networks

James Benvenuto (PhD, Fall 2010), Research Staff Member at HRL Laboratories, Center for Neural and Emergent Systems, Santa Monica, CA
Dissertation Research: Epitaxis A System for Deductive and Constructive Program Queries

Di Wu (PhD, Winter 2013) Professor, Computer Science, Hunan University, China
Dissertation Research: Location Based Services in Vehicular Networks

Tianbing Xu (PhD, Fall 2013), Senior Research Scientist/Software Engineer, Facebook, Bay Area, California
Dissertation Research: Online Advertising: A Large Scale Computing Perspective

Scott Godfrey (PhD, 2016), Senior Engineer, Zoox, Bay Area, California
Dissertation Research: Cross-System Runtime Prediction of Parallel Applications on Multi-Core Processors

Dmitri Arkhipov (PhD, 2017), Independent Software Engineering Consultant, Irvine
Dissertation Research: Computational Models for Scheduling in Online Advertising

Karina Hermawan (PhD, 2018), Senior Data Analyst, Hyundai Air Mobility
Dissertation Research: Transportation Network Companies' (TNC) Impacts and Potential on Airport Access

Reza Asadi (PhD, Spring 2020), Machine Learning Research Engineer, Uber
Dissertation Research: Neural Network Models for Spatio-Temporal Data Forecasting and Analysis

Amari Lewis (PhD Spring, 2021), UC San Diego Department of Computer Science, Post Doctoral Researcher and lecturer.
Dissertation Research: Case Studies in Secure Contracting and communication in Transportation Systems,

Uber Exhibit 1003 - p. 485
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Dalal Alharthi (PhD Spring, 2021), University of Arizona, Assistant Professor of Practice in Cyber Systems (tenure track)

Dissertation Research: Social Engineering Defense Mechanisms and InfoSec Policies: A Survey and Qualitative Analysis, University of Arizona, Assistant Professor of Practice in Cyber Systems

Ceasar Aguma (PhD Summer, 2022), Data Scientist, ETS
Dissertation Research: Auction Mechanism Design for Housing and Transportation Resource Allocation

Post Doctoral Researcher Supervision

Dmitri Arkhipov, PhD Computer Science, University of California, Irvine

Soumia Ichoua, PhD Computer Science, University of Montreal
Research area: Applications of Optimization Techniques to Dynamic and Stochastic Distribution Systems, Telecommunication Systems and E-commerce, Location Theory

Xiangwen Lu, PhD Transportation Systems Engineering, University of California, Irvine
Research area: Dynamic and Stochastic Routing and Scheduling, Inventory Management

Jiongjiong Song, PhD Transportation Systems Engineering, University of California, Irvine
Research area: Emissions Modeling, Truck/Rail Tradeoffs

Choon Heon Yang, PhD, Transportation Systems Engineering, University of California, Irvine
Research area: Freight Flow Modeling

Service (UC Irvine)

Departmental, School, Academic Senate and UC Wide Committee Appointments

Civil & Environmental Engineering Graduate Studies Committee (Graduate Admissions Coordinator: Transportation Group, 1998-2001)
Civil & Environmental Engineering Computer Committee (Chair)
Civil & Environmental Engineering Corporate Affiliates Program - Program Planning Committee
School of Engineering Library Committee (Chair)
School of Engineering Committee on Computing
Computer Science Graduate Admissions Committee, 2008-Present
UCI Academic Senate Committee on Teaching (Chair 2001-2002, 2002-2003)
UCI Academic Senate Committee on Student Experiences (Co-Chair 2003-2004)
UCI Faculty Board for Undecided Undeclared Students (2006-2009)
UCI Faculty Committee on Parking (2005-2007)
UCI Academic Senate Committee on Rights, Responsibilities & Welfare
Ad Hoc Study Group on the Summer Session
UCI EVC's working group on the expansion of the Summer Session, academic senate representative
UCI RGS Faculty Advisory Group on the Electronic Educational Environment to the Office of Academic Computing
UCI RGS Advisory Group on the development of an electronic environment in support of graduate recruiting, retention and student life
University of California Teaching Learning and Technology Center Grant Evaluation Committee 2001-2003
University of California Pacific Rim Research Program Grant Evaluation Committee 2003-2006, 2006-2009
UCI Pacific Rim Research Program Internal Grant Evaluation Committee 2009-2012
UCI Committee on Academic Personnel 2010-2013

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ICS, Department of Computer Science Admissions Committee, 2008-2013
University of California President's Postdoctoral Fellowship Program, application reviewer, 2011-2013
ICS Student Affairs Director Search Committee, 2012
ICS Executive Committee, Vice Chair, 2013-2014
CS Decade Mentor, 2013- Present
Faculty Director, MS and PhD programs in Transportation Science, 2015-2018
Faculty Director, CS MCS Degree Program, 2015-2018
UCI Representative System Wide UCOLASC (Committee on Scholarly Communication and the Libraries), 2016 – 2019

Other Substantial UCI Service

Division of Undergraduate Education, Advisor, Unaffiliated Undeclared Students 1999-2007
Director, UCI/Anaheim School District Teachers as Scholars Program, 2002-2003
Faculty Advisor, Society of Women Engineers, 2001-2004
UCI-Santa Ana Teachers Institute, Instructor, 2000-2002
California State Summer School in Math and Science, Instructor, 2001-2003, 2005
Participant, Newport/Mesa, Santa Ana and Los Angeles School Districts "Ask a scientist" nights
McNair Program Board of Directors, 2001-2003
Regular speaker, CAMP (California Alliance for Minority Participation), McNair and AGEP (Alliances for Graduate Professionals and the Sciences) programs
Participant, UCI Graduate Fellowship Selection Committees
Faculty Mentor for the winning team in the 2003 ICS extreme computing competition
Faculty Mentor, 2004 ICS extreme computing competition
Acting Associate Dean, Division of Undergraduate Education, Summer, Fall 2003
Statistics Department Search Committee, 2003-2004, 2004-2005
CALIT2 search committee 2005-2006
Transportation Economics Search Committee, 2003-2004
Statistics Department Search Committee, 2004-2005
Dean, Undergraduate Education Search Committee, 2004-2005
CALIT2 Faculty Advisory Board, 2007-2012

Professional Memberships/Service

Institute for Operations Research and the Management Sciences (INFORMS)
- Transportation Science Section: Council Member, 1999-2001, Vice Chair, 2003-2004, Chair 2004-2005
  Cluster Coordinator for fall 1998 meeting, Cluster Coordinator for fall 2002 meeting
- Logistics Section; Cluster Coordinator for fall 1999 meeting
- Women in ORMS Forum, 1997-2001, VP Communications & Webmaster, 1997-2001, VP and President Elect, 2002-2003, President, 2003-2004
- Teaching of Practice Prize Committee Member, 1999-2001

Transportation Research Board (TRB)
- Member, Freight Planning and Logistics Committee: Contributor and Primary Editor, Freight Planning and Logistics TRB Millennium Paper, Paper and Session Editor for the 2002, 2003, 2004 Meetings, Logistics Subcommittee Chair 2002-2008
- Member, Network Analysis Committee, Network and Commercial Fleet Subcommittee Chair 2003-2009

IEEE

University of California Transportation Center, Advisory Board, 2000-2004, Chair, dissertation prize committee 2000-2002

World Congress on Transportation Research
- Founding member of the SIG on Traffic Theory and Modeling, 2014-present

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Editorial Advisory Board

Transportation Research, Part B, Methodological, 1997-2018
Transportation Research Record (Freight Planning and Logistics Committee, Network Analysis Committee), 1999-2009

Editorial Board

International Journal of Advanced Logistics, 2014- present

Paper Reviewer

4OR - A Quarterly Journal of Operations Research
Applied Mathematical Modelling
Artificial Intelligence Review
Computational Optimization and Applications
Computers and Industrial Engineering
Computers and Operations Research
Computing Reviews
European Journal of Operations Research
European Journal of Transport and Infrastructure Research
EURO Journal on Transportation and Logistics
IEEE Transactions on Automation Science and Engineering
IEEE Transactions on Intelligent Transportation Systems
IEEE Transactions on Networks
IEEE Transactions on Vehicular Technology
IEEE Intelligent Transportation Systems Magazine
IIE Transactions
Interfaces
International Journal of Quality, Statistics, and Reliability
Journal of Multi-Criteria Decision Analysis
Journal of Optimization Theory and Applications
Journal of the Operational Research Society
Journal of Transportation Engineering
Journal of Transport Geography
KSII Transactions on Internet and Information Systems
Management Science and Operations Management
Management Science and Operations Research
Naval Logistics Quarterly
Networks and Spatial Economics
Operational Research
Operations Research
PLOS-One
Research in Transportation Economics
Sensors
Transport Policy
Transportation Research Record
Transportation Research, Part A: Policy and Practice
Transportation Research, Part B: Methodological
Transportation Research, Part C: Emerging Technologies
Transportation Research, Part E: Logistics and Transportation Review
Transportation Science
World Congress of Transportation Research

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Proposal Reviewer

PATH
USC METRANS
Oregon OTREC
Purdue JTPR
Maryland Industrial Partnerships
Northwestern University Transportation Center
Hong Kong Research Council
Singapore Agency for Science Technology and Research,
Chilean National Science Foundation FONDECYT
Dutch Technology Foundation STW
Israel Science Foundation
United States – Israel Binational Science Foundation
Qatar National Research Fund
NSF
- Construction and Transportation Engineering Review Panel, June, 1999,
- Innovations in Service Systems Review Panel, June 2002
- CAREER Review Panel, Fall 2003
- Math Science Partnership Review Panel, February, 2004
- CAREER Review Panel, Fall 2006
- Transportation Review Panel, Fall 2008
- CMMI Review Panel, Fall 2011(ad hoc reviewer)
- CMMI Review Panel, Spring 2012
- Transportation Review Panel, Spring 2015
- Smart and Connected Cities Panel, Spring 2020
- Smart and Connected Cities Panel, Spring 2021

Other

Member, National Academies of Sciences Panel on International Trade and Transportation, 2003-2004
Participant: NSF workshop on Planning, Design, Management and Control of Transportation Systems (December, 1997), NSF Engineering Education Scholars Program (June, 1997), NSF workshop on Teaching Simulation (August, 1998), NSF workshop on Women in Industrial Engineering in Academia, May, 2012
Team Leader, National Academies of Sciences Panel on Committee on Technologies and Approaches for Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles, Phase 2, 2013-2017
Member, search committee for Chaired Professor at the Technical University of Dresden, 2021

Consulting

Market Data Corporation, on the development of electronic freight marketplaces 2000-2001
Fortigo, Corporate Advisor on the development of an ASP to facilitate Shipper/Carrier interactions, 2001
NTE, on the development of an ITS architecture for the Ports of Long Beach/LA, 2004
USAID, on the application of emerging technologies for port efficiency, safety and security in Jordan, 2005

Expert Witness Experience

On the quality of a large scale third party logistics software system for Gordon Thomas Honeywell, 2011-2013

University College London
Reuben Smeed Memorial Professorial Research Fellow, Center for Transport Studies**,** March 2015-July 2015

The Athens University of Economics and Business

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Visiting Professor, Decision Sciences Summer 2002, Spring 2003, Spring 2004, Spring 2005, Spring 2006

Technical University of Denmark
Visiting Professor, Operations Research Summer, 2003

The University of Texas, Department of Civil Engineering, Austin TX
Graduate Research Assistant, September 1991-December 1996

University of Montreal, Center for Research on Transportation Montreal, (Quebec)
Visiting Graduate Research Assistant, Fall 1994

Arrowsmith Technologies, Austin TX 1992-1994
Operations Research/Systems Engineering Analyst (Part time)

United Parcel Service/ROADNET Technologies, Baltimore, MD 1988-1991
Software Engineer/Operations Research Analyst/Industrial Engineering Supervisor

Association of American Railroads, Washington, DC 1987 - 1988.
Research Analyst

United Parcel Service, Philadelphia, PA 1986 - 1987.
Industrial Engineering Intern

Awards

Best Paper Award – VEHITS 2021 -- A Trusted Blockchain-based Emissions Trading System for Vehicle-to-Vehicle Networks, Lam D Nguyen, Amari Lewis, Israel Leyva-Mayorga, Amelia Regan and Petar Popovski
Best Paper Award -- ACM SIGSPATIAL – Predict2019 Workshop, Spatio-Temporal Clustering of Traffic Data with Deep Embedded Clustering, Resa Asadi and Amelia Regan.
Rueben Smeed Memorial Professorial Research Fellowship, University College London 2014-2015
INFORMS Featured Article on-line, Chow, J.Y-J., and A.C. Regan (2011), Real Option Pricing of Network Design Investments, Transportation Science, 45(1), http://www.informs.org/Sites/IPOL/Featured-Articles
University of California Irvine Academic Senate Distinguished Faculty Mid-Career Award for Service, 2005-2006
University of California, Irvine, Department of Civil Engineering, Outstanding Assistant Professor Award, 2000
National Science Foundation CAREER Award, 1999-2003
Dwight D. Eisenhower Dissertation Fellowship, 1993-1996
University of Texas at Austin Advanced Institute for Transportation Infrastructure and Engineering Fellow, 1991, 1992, 1996
Winner, National Motor Carrier Symposium Student Paper Competition, 1992

Publications (over 175 refereed journal articles, conference proceedings and book chapters)

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C 51. Yang, C.H. and A.C. Regan (2009), Prioritization of Potential Alternative Truck Management Strategies using the Analytical Hierarchy Process, Proceedings of the 2009 meeting of the Transportation Research Board

C 50. Yang, C.H., Y-J. Chow and A.C. Regan (2009), State-of-the Art of Freight Forecasting Modeling: Lessons Learned and the Road Ahead, Proceedings of the 2009 meeting of the Transportation Research Board.

C 49. Tsai, M-T, J-D, Saphores, and A.C. Regan (2009), Freight Transportation Contracting Under Uncertainty, Proceedings of the 2009 meeting of the Transportation Research Board.

C 48. Chen, R. and A.C.Regan (2009), Wireless Networks for Car-and-Ride Sharing Systems, Assessment of 802:11 Wi-Fi, Proceedings of the 2009 meeting of the Transportation Research Board.

C 47. Tsai, M-T, A.C. Regan and J-D, Saphores (2008) Freight Transportation Derivatives Contracts: State of the Art and Future Developments, Proceedings of the 87th meeting of the Transportation Research Board

C 46. Wang, J-F, A.C. Regan and M-T Tsai (2008) Minimizing Departure Time for Outgoing Trucks in a Crossdock, Proceedings of the 87th meeting of the Transportation Research Board

C 45. Apivatanagu1, P and A. C. Regan (2008), A Solution Algorithm for Long Haul Freight Network Design Using Shipper-Carrier Freight Flow Prediction with Explicit Capacity Constraints, Proceedings of the 87th meeting of the Transportation Research Board

C 44. Yang, C.H. and A.C. Regan (2007), Impacts of Left Lane Truck Restriction on Urban Freeways, Proceedings of the 2nd Annual National Urban Freight Conference

C 43. Tsai, M-T, A.C. Regan and J-D, Saphores (2007) Freight Transportation Derivatives Contracts: State of the Art and Future Developments, Proceedings of the 2nd Annual National Urban Freight Conference

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C 42. Wang, J-F, A.C. Regan and M-T Tsai (2007) Minimizing Departure Time for Outgoing Trucks in a Crossdock Proceedings of the 2nd Annual National Urban Freight Conference

C 41. Apivatanagu1, P and A. C. Regan (2007), A Solution Algorithm for Long Haul Freight Network Design Using Shipper-Carrier Freight Flow Prediction with Explicit Capacity Constraints, Proceedings of the 2nd Annual National Urban Freight Conference

C 40. Apivatanagu1, P and A. C. Regan (2007), A Modeling Framework for the Design of a Multimodal Long Haul Freight Network, Proceedings of the 86th meeting of the Transportation Research Board

C 39. Yang, C.H. and A.C. Regan (2007), Evaluation of General Truck Management Strategies Based on Integrated Simulation Studies (Case Study: I-710 in Southern California) Proceedings of the 86th meeting of the Transportation Research Board

C 38. Nandiraju S. and A.C. Regan (2007), Shipper Collaboration Models for Asset Repositioning: A Cooperative Game Theory Approach, Proceedings of the 86th meeting of the Transportation Research Board

C 37. Apivatanagul, P and A. C. Regan (2006), Improving Loop Detector Based Estimates of Large Truck Traffic for Accident Analysis, Proceedings of the ISSOT (International Student Symposium on Transportation Research), Bangkok, Thailand

C 36. Golob, T and A.C. Regan (2005), Truck-Involved Crashes And Traffic Levels On Urban Freeways, Proceedings of the 84th meeting of the Transportation Research Board

C 35. Nandiraju, S., and A.C. Regan (2005), Freight Transportation Electronic Marketplaces: A Survey of the Industry snd Exploration of Important Research Issues, Proceedings of the 84th meeting of the Transportation Research Board

C 34. Park, M. and A.C. Regan, (2005), Capacity Modeling in Transportation: A Multimodal Perspective Proceedings of the 84th meeting of the Transportation Research Board

C 33. Song, J., A.C. Regan and S. Nandiraju (2005), A Bid Analysis Model with Business Constraints for Transportation Procurement Auctions, Proceedings of the 84th meeting of the Transportation Research Board.

C 32. Golob, T and A.C. Regan (2004), Truck-Involved Crashes And Traffic Levels On Urban Freeways, *Transportation Research Record*, proceedings of the 83rd meeting of the Transportation Research Board.

C 31. Song, J. and Regan, A.C. (2004), An Auction Based Collaborative Carrier Network, proceedings of the 83rd meeting of the Transportation Research Board.

C 30. Regan, A. C. and T.F. Golob (2004) Trucking Industry Demand for Urban Shared Use Freight Terminals, proceedings of the 83rd meeting of the Transportation Research Board.

C 29. Park, M.Y. and A.C. Regan (2004), Issues In Emerging Home Delivery Operations, proceedings of the 83rd meeting of the Transportation Research Board.

C 28. Zografos, K, and A.C. Regan (2004), Current Challenges for Intermodal Freight Transport and Logistics in Europe and the US, proceedings of the 83rd meeting of the Transportation Research Board.

C 27. Song, J. and A.C. Regan (2004), Approximation Algorithms for the Bid Valuation and Structuring Problem in Combinatorial Auctions for the Procurement of Freight Transportation Contracts proceedings of the 83rd meeting of the Transportation Research Board.

C 26. Wang, X. and A.C. Regan (2004), Stochastic And Dynamic Yield Management when Aircraft Assignments are Subject to Change, proceedings of the 83rd meeting of the Transportation Research Board.

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C 25. Forster, P.W., A.C. Regan (2004), Information Technology adoption and use in non-integrated Air Cargo Operations, *Transportation Research Record*, proceedings of the 83rd meeting of the Transportation Research Board.

C 24. Song, J and A.C. Regan (2003), Combinatorial Auctions for Transportation Service Procurement: An Examination of Carrier Bidding Policies, proceedings of the 2003 meeting of the IATBR.

C 23. Golob, T.F. and A.C. Regan (2003), Surveying and Modelling Trucking Industry Perceptions, Preferences and Behaviour, proceedings of the 2003 meeting of the IATBR.

C 22. Wang, C. and A.C. Regan (2003), Risks and Prevention Measures in Logistics Outsourcing, proceedings of the 82nd meeting of the Transportation Research Board.

C 21. Wang, X and A.C. Regan (2003) Two Time Window Discretization Methods for the Multiple Traveling Salesman Problem with Time Windows, proceedings of the 82nd meeting of the Transportation Research Board.

C 20. Golob, T.F. and A.C. Regan (2003), Traffic Congestion and Trucking Managers' Demand for Routing and Scheduling Software, proceedings of the 82nd meeting of the Transportation Research Board.

C 19. Song, J. and A.C. Regan (2003), Combinatorial Auctions for Transportation Service Procurement: The Carrier Perspective, proceedings of the 82nd meeting of the Transportation Research Board.

C 18. Golob, T.F. and A.C.Regan (2003), Trucking Industry Perceptions of Traveler Information for Drivers Using Wireless Internet-enabled Devices, proceedings of the 82nd meeting of the Transportation Research Board.

C 17. Lu, X, A.C. Regan and S. Irani (2002), Dynamic Traveling Repair Problem: Examination of an Asymptotically Optimal Algorithm, proceedings of the 81st meeting of the Transportation Research Board.

C 16. Regan, A.C., J. Herrmann, and X. Lu (2002), The Relative Performance of Heuristics for the Dynamic Traveling Salesman Problem, proceedings of the 81st meeting of the Transportation Research Board.

C 15. Irani,S, X. Lu and A.C. Regan (2002), Competitive Analysis of Algorithms for the Dynamic Traveling Salesman Problem, proceedings of the 2002 meeting of the Symposium on Discrete Algorithms, San Francisco, January.

C 14. Lu, X. A.C. Regan and S. Irani (2001), Dynamic and Stochastic Fleet and Freight Management: Algorithm Development and Performance Analysis, Proceedings of the 2001 TRISTAN Conference, San Pablo, June.

C 13. Wang, X and A.C. Regan (2001), Assignment models for local truckload trucking problems with stochastic service times and time window constraints, Proceedings of the 80th meeting of the Transportation Research Board, Washington DC, January.

C 12. Golob, T.F. and A.C. Regan (2001), Carrier perceptions of the Usefulness of Various Sources of Information, Proceedings of the 80th meeting of the Transportation Research Board, Washington DC, January.

C 11. Regan, A.C. and J. Song (2001), An Industry in Transition: Third Party Logistics in the Information Age, Proceedings of the 80th meeting of the Transportation Research Board, Washington DC, January.

C 10. Golob, T.F. and A.C. Regan (2001), Impacts of Information Technology on Personal Travel and Commercial Vehicle Operations: Research Challenges and Opportunities, Proceedings of the 80th meeting of the Transportation Research Board, Washington DC, January.

C 9. Regan, A.C., S. Jagannathan, and X. Wang (2000), Mixed global and local assignment algorithms for quasi dynamic local truckload trucking operations with strict time-windows, proceedings of the 79th meeting of the Transportation Research Board, Washington DC, January.

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C 8. Golob, T. and A.C. Regan (2000), Trucking Industry Demand for Information Technologies, A Multivariate Discrete Choice Model, Proceedings of the 79th meeting of the Transportation Research Record, Washington DC, January.

C 7. Regan, A.C. and R.A. Garrido (2000), Freight demand and shipper behavior modeling: State of the art, directions for the future, resource paper*, proceedings of the 2000 meeting of the International Association of Travel Behavior Modeling (IATBR),* Gold Coast, Australia, July.

C 6. Golob, T. and A.C. Regan (2000), Impacts of Highway Congestion on Freight Operations, Perceptions of Industry Managers, Proceedings of the 79th meeting of the Transportation Research Record, Washington DC, January.

C 5. Golob, T., and A.C Regan (1999), Freight Industry Attitudes Towards Policies to Reduce Congestion, Proceedings of the 78h meeting of the Transportation Research Record, Washington DC, January.

C 4. Regan, A.C. and T.F Golob (1999), Freight Operators' Perceptions of Congestion Problems and the Application of Advanced Technologies: Results from a 1998 survey of 1200 companies operating in California, Proceedings of the 78h meeting of the Transportation Research Record, Washington DC, January.

C 3. Regan, A.C., Mahmassani, H.S. and P. Jaillet (1995), "Dynamic vehicle allocation under real time information: operational considerations and potential efficiencies", *proceedings of the Fourth International Conference on Applications of Advanced Technologies in Transportation Engineering*, Capri, Italy, June.

C 2. Regan, A.C., H.S. Mahmassani and P. Jaillet (1995), "Dynamic Vehicle Allocation for Fleet Management: Operational Changes for Improved Efficiency", *proceedings of the Second World Congress on Applications of Transport Telematics & Intelligent Vehicle-Highway Systems*.

C 1. Regan, A.C., H.S. Mahmassani and P. Jaillet (1994), "Real Time Information for Improved Efficiency of Commercial Vehicle Operations", *proceedings of the First World Conference on Applications Transport Telematics & Intelligent Vehicle-Highway Systems*.

Extended Abstracts

Regan, A.C. (2012), Cyber-Physical Transportation Systems: Promise and Challenges, Invited Position Paper, 1st International Workshop on Reliable CyberPhysical Systems, WRCPS 2012, University of California, Irvine, October 2012

Regan, A.C., Mahmassani, H.S. and P. Jaillet (1998), Dynamic Re-Sequencing and En-route Diversion Strategies for Carrier Fleet Operations: Simulation Investigation, *preprints of the TRISTAN III conference*, San Juan PR, June.

Published Book Reviews

R. 4 Regan A.C. (2014) Review of Combinatorial search : from algorithms to systems by Y. Hamadi, Springer Publishing Company, Incorporated, New York, NY, 2013

R. 3 Regan, A.C. (1999), Review of Information Systems in Logistics and Transportation, Bernard Tilanus (ed), *Transportation Research Part A*, Vol 33 A, No 6, pp. 478-480.

R.2 Regan, A.C. (2002), Review of Designing and Managing the Supply Chain, Simchi-Levi, Kaminski and Simchi-Levi, *Transportation Science*, 36(3) p 364.

R. 1 Regan, A.C. (2003), Review of Handbook of Logistics and Supply-Chain Management, *Transportation Research*, 37 (2) pp 189 – 190.

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Papers in Conference Proceedings (invited)

Golob, T.F. and A.C. Regan (2000), Impacts of Urban Congestion on Freight Operations: Perceptions of Trucking Industry Managers, proceedings of the Entretiens J. Cartier, Montreal, October, 2000.

Extended Abstracts

Regan, A.C. (2012), Cyber-Physical Transportation Systems: Promise and Challenges, Invited Position Paper, 1st International Workshop on Reliable CyberPhysical Systems, WRCPS 2012, University of California, Irvine, October 2012

Regan, A.C., Mahmassani, H.S. and P. Jaillet (1998), Dynamic Re-Sequencing and En-route Diversion Strategies for Carrier Fleet Operations: Simulation Investigation, *preprints of the TRISTAN III conference*, San Juan PR, June.

Selected Presentations

Warehouse Automation, University of Washington, Civil and Environmental Engineering Department, May 2022

Robots and Warehouses, MIT Center for Logistics and Transportation, May 2021

Matching Mechanisms for Congestion Pricing, MIT Center for Logistics and Transportation, March 2020.

Ethical Concerns in Emerging Transportation Industries, Invited Presentation, Transportation Research Forum Special On-line meeting, March 2020.

Ethical Considerations of Mobility-As-A-Service Operations, George Mason University, September, 2019

Ethical Considerations of Mobility-As-A-Service Operations, Texas A&M University, August, 2019

Problem based learning in Business and Engineering Education, National Chung Hsing University, Taichung, Taiwan, April 2019

Microtransit and Micromobility, National Chung Hsing University in Taichung, Taiwan, 2019

Emerging Trends in Microtransit and Micromobility, National Cheng Kung University, Taiwan, April 2019.

Emerging Trends in Microtransit and Micromobility: benefits to consumers, a few promising directions and many terrible ideas, VIP speaker, COTA International Conference of Transportation Professionals in Nanjing, China in July, 2020

Big Data & Emerging Vehicle Technology, Bejing University of Technology, July 2020

Managing Drone Swarms for Urban and Emergency Response Operations, National University of Singapore, March, 2019

Managing Drone Swarms for Urban and Emergency Response Operations, at Hong Kong Polytechnic University (PolyU), February, 2019

Surprising Opportunities for Sustainability in Transportation, Invited Talk, University College London, December 2016

Computational Problems in Transportation and Logistics, Invited Talk, Aalto University, Finland, September,

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2016

Integration of crowdsourced and traditional data for route analysis and route finding for pedestrians with disabilities, Transportation Research Forum, Toronto, April, 2016

A Safety Perception Indicator for Vulnerable Road Users In Urban Environments, Transportation Research Forum, Toronto, April, 2016

Computation Problems in Auctions, Invited Talk, Arizona State University, February, 2016

Computational Problems in Auctions with Applications in Transportation and Logistics, Invited Talk, Center for Transport Studies, University College London, December, 2015

Computation Problems in Auctions, Invited Talk, UCI Department of Computer Science, November, 2105

From Vehicles to What?, Invited Talk, SAE COMVEC, October, 2015.

Transformational Technologies on the Transportation Horizon: Topics Every Transportation Engineer Should Know, Invited Talk, Texas A&M University, March 2015.

Transformational Technologies and Logistics Systems, Invited Talk, Inha University, Asia Pacific School of Logistics, November, 2014

Transformational Technologies and Logistics Systems, Korean Aerospace University, November 2014

The Role of Public Agencies in the Adoption of Advanced Transportation Technologies, Invited Talk, Korean Korea Institute of Civil Engineering and Building Technology, November, 2014

Transformational Technologies on the Transportation Horizon, Invited Keynote Talk, Joint National Academy of Engineering/Chinese National Academy of Engineering IT 2020 Conference, Beijing, October 2014

Transformational Technologies on the Transportation Horizon, Invited Talk, Cal Poly San Luis Obispo, October, 2014.

Impediments to the Implementation of Ad Hoc Vehicular Networks for Improved Road Safety, Imperial College London, July, 2014

Vehicular Ad Hoc Networks: Finally a Reality? Transportation Research Forum, San Jose, CA, March 2014

Prioritization, Inventory Planning and Budgeting for Road Management Resources: A Case Study of South Korea, Transportation Research Forum, San Jose, CA, March 2014

Modeling Environmental Impacts and Adoption of Alternative Fuel Vehicles in Advancing the State of Freight Transportation, Part 1: Network and Logistics Modeling, Invited Presentation, Transportation Research Board Meeting, Washington, DC, January, 2014

Parallel and distributed computing for large-scale transportation network design problems, University of Maryland, September, 2013.

Current Ideas and Issues Related to Cyber-Physical Transportation Systems, 1st International Workshop on Reliable CyberPhysical Systems, WRCPS 2012, University of California, Irvine, October 2012

Providing a basic Operations Research Curriculum in the Absence of a formal OR program, NSF workshop in Women in IE Academic, Istanbul, Turkey, June 2012

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Computational Issues for Transportation Modeling, Presented at Texas A&M University, April 2012

Resource Location and Relocation Models with Forecasting for Wildland Fire Planning, Presented at the University of Southern California, May, 2011

Broadcasting in Ad Hoc Vehicular Networks, Presented at the University of Michigan, Dearborn, October 2009.

Current issues in modeling of logistics systems, Presented at Northwestern University, August 2009

Data for Freight Decision Making, Presented at the 2009 meeting of the National Urban Freight Conference, Long Beach, CA.

Long Haul Freight Network Design Using Shipper-Carrier Freight Flow Prediction: A California Network Improvement Case Study, Presented at the 2009 meeting of the Transportation Research Board, Washington DC, January 2009.

Heuristics for Freight Procurement Auctions with Carrier Capacity and Shipper Side Constraints, Presented at the 2009 meeting of the Transportation Research Board, Washington DC, January, 2009.

Prioritization of Potential Alternative Truck Management Strategies using the Analytical Hierarchy Process, Presented at the 2009 meeting of the Transportation Research Board, Washington DC, January 2009.

Freight Transportation Contracting Under Uncertainty, Presented at the 2009 meeting of the Transportation Research Board, Washington DC, January 2009.

Wireless Networks for Car-and-Ride Sharing Systems, Assessment of 802:11 Wi-Fi, Presented at the 2009 meeting of the Transportation Research Board, Washington DC, January 2009.

University of California, Irvine, Research Symposium, Invited Panel on Workforce Issues in the Technology Sector, May 2005

Women in Technology in the US, recent progress and continuing challenges, Presented at the first annual women in Leadership Conference, Tainan Women's College of Business and Technology, Tainan, Taiwan, May 2005

Issues in the US Logistics Industries, Invited Presentation, National Cheng Kung University, Tainan, Taiwan, May 2005

Truck-Involved Crashes And Traffic Levels On Urban Freeways, Presented at the 84th meeting of the Transportation Research Board, Jan, 2005

Freight Transportation Electronic Marketplaces: A Survey Of The Industry And Exploration Of Important Research Issues, Presented at the 84th meeting of the Transportation Research Board, Jan, 2005

Capacity Modeling in Transportation: A Multimodal Perspective, Presented at the 84th meeting of the Transportation Research Board, Jan, 2005

A Bid Analysis Model with Business Constraints for Transportation Procurement Auctions, Presented at the 84th meeting of the Transportation Research Board, Jan, 2005

Rule-based Price Discovery Methods in Transportation Procurement Auctions, Informs Conference on Revenue Management and Pricing, June 2004

Opportunities and Challenges for New Logistics Professionals, Invited Presentation, Beijing Jiaotong University, May, 2004

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Bidding and Bid Analysis Problems in Combinatorial Auctions for the Procurement of Transportation Service Contracts, the 2004 International Conference on Logistics, Beijing, May 2004

Truck-Involved Crashes And Traffic Levels On Urban Freeways, presented at the 2004 meeting of the Transportation Research Board, January, 2004

An Auction Based Collaborative Carrier Network, presented at the 2004 meeting of the Transportation Research Board.

Trucking Industry Demand for Urban Shared Use Freight Terminals, presented at the 2004 meeting of the Transportation Research Board, January, 2004

Issues In Emerging Home Delivery Operations, presented at the 2004 meeting of the Transportation Research Board, January, 2004

Current Challenges for Intermodal Freight Transport and Logistics in Europe and the US, presented at the 2004 meeting of the Transportation Research Board, January, 2004

Approximation Algorithms for the Bid Valuation and Structuring Problem in Combinatorial Auctions for the Procurement of Freight Transportation Contracts, presented at the 2004 meeting of the Transportation Research Board, January, 2004

Stochastic And Dynamic Yield Management when Aircraft Assignments are Subject to Change, presented at the 2004 meeting of the Transportation Research Board, January, 2004

Information Technology adoption and use in non-integrated Air Cargo Operations, presented at the 2004 meeting of the Transportation Research Board, January, 2004

Combinatorial Auctions for Transportation Service Procurement: An Examination of Carrier Bidding Policies, Presented at the 2003 meeting of the IATBR, Luzern, Switzerland, August, 2003

Surveying and Modelling Trucking Industry Perceptions, Preferences and Behaviour, presented at the 2003 meeting of the IATBR, Luzern, Switzerland, August, 2003

Emerging Issues in Short and Long Term Contracting for Trucking Services, invited presentation, University of Southern California, September, 2003.

Bidding in Combinatorial Auctions– Solving the Routing Sub-Problems, ROUTE 2003, Denmark

Combinatorial Auctions for Freight Transportation Service Contracting: Industry and Policy Implications, presented at the 2003 UCTC student conference, February, 2003.

Trucking Industry Perceptions of Traveler Information for Drivers Using Wireless Internet-enabled Devices, presented at the 2003 meeting of the Transportation Research Board, Jan, 2003.

Two Time Window Discretization Methods for the Multiple Traveling Salesman Problem with Time Windows, presented at the 2003 meeting of the Transportation Research Board, Jan, 2003.

Traffic Congestion and Trucking Managers' Demand for Routing and Scheduling Software, presented at the 2003 meeting of the Transportation Research Board, Jan, 2003.

Risks and Prevention Measures in Logistics Outsourcing, presented at the 2003 meeting of the Transportation Research Board, Jan, 2003.

Combinatorial Auctions for Transportation Service Procurement: The Carrier Perspective, presented at the 2003

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meeting of the Transportation Research Board, Jan, 2003.

Traffic Congestion and Trucking Managers' Demand for Routing and Scheduling Software, presented at the 2003 meeting of the Transportation Research Board, Jan, 2003.

Rebate, Returns, and Price Protection Polices in Supply Chain Coordination, presented at the 2002 meeting of INFORMS, November 2002.

A Priori Routing Policies for Dynamic and Stochastic Traveling Salesman Problems, presented at the 2002 meeting of INFORMS, November 2002.

Time-window Discretization Methods for the Multiple Traveling Salesman Problem with Time Windows, presented at the 2002 meeting of INFORMS, November 2002.

Revisiting the Probabilistic Traveling Salesman Problem: An examination of new heuristics, Presented at IFORS, Edinburgh, July, 2002

Analytical Examination of Heuristics for the Probabilistic Traveling Salesman Problem, Presented at IFORS, Edinburgh, July 2002

Combinatorial Auctions from the Carrier Perspective, , Presented at IFORS, Edinburgh, July 2002 Rebate, Returns, and Price Protection Polices in Supply Chain Coordination, Optimization Days, Montreal, May, 2002

Analytical Examination of a Heuristic for the Probabilistic Traveling Salesman Problem, Optimization Days, Montreal, May 2002

Location and Allocation Routing of Mobile Medical Units Optimization Days, Montreal, May, 2002

Combinatorial Auction in Procurement of Transportation Services from Carriers' Perspective, Optimization Days, Montreal, May 2002

A priori, rolling horizon and on-line optimization for dynamic and stochastic routing and scheduling, invited presentation, NSF workshop on real-time fleet management, Long Beach, April 2002

Dynamic and Stochastic Routing and Scheduling: Recent Developments and On-going Research, invited presentation, University of California, Berkeley, April, 2002.

Dynamic and Stochastic Routing and Scheduling: Recent Developments and On-going Research, invited presentation, University of California, Berkeley, March, 2002.

Dynamic and Stochastic Routing and Scheduling: Recent Developments and On-going Research, invited presentation, Northwestern University, February, 2002.

Dynamic and Stochastic Routing and Scheduling: Recent Developments and On-going Research, invited presentation, University of Southern California, February, 2002.

An Asymptotically Optimal Algorithm for the Dynamic Traveling Repair Problem, presented at the 81st meeting of the Transportation Research Board, January, 2002

The Relative Performance of Heuristics for the Dynamic Traveling Salesman Problem presented at the 81st meeting of the Transportation Research Board, January, 2002

Dynamic and Stochastic Network Optimization: Recent Developments and On-going Research, Presented at the University of Texas, September, 2001

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Impacts of Information Technology on Freight Transportation Optimization, presented at the 2001 meeting of the ITSC, Oakland, California, August, 2001.

The Irvine ITS California Test Bed, presented at the 2001 meeting of the ITSC, Oakland, California, August, 2001.

Dynamic and Stochastic Fleet Management, presented at the 4th international TRISTAN meeting, Sao Miguel, Portugal, June, 2001.

Impacts of Information Technology in Transportation Logistics, presented at the 4th international TRISTAN meeting, Sao Miguel, Portugal, June 2001.

Carrier perceptions of the Usefulness of Various Sources of Information, presented at the 80th meeting of the Transportation Research Board, January, 2001

An Industry in Transition: Third Party Logistics in the Information Age, presented at the 80th meeting of the Transportation Research Board, January, 2001

Impacts of Information Technology on Personal Travel and Commercial Vehicle Operations: Research Challenges and Opportunities, presented at the 80th meeting of the Transportation Research Board January, 2001

Assignment models for local truckload trucking problems with stochastic service times and time window constraints, presented at the 80th meeting of the Transportation Research Board, January, 2001.

Impacts of Urban Congestion on Freight Operations: Perceptions of Trucking Industry Managers, presented at the Entretiens J. Cartier, Montreal, October, 2000.

Freight demand and shipper behavior modeling: state of the art, directions for the future, resource paper presented at the 2000 meeting of the International Association of Travel Behavior Researchers, Gold Coast, Australia, July, 2000.

An Approximation Algorithm for Real-Time Application to Time-Constrained Vehicle Routing & Scheduling, INFORMS, Salt Lake City, May, 2000.

Use & Usefulness of Traffic Information Sources in Commercial Vehicle Operations: The Trucking Industry Perspective, INFORMS, Salt Lake City, May, 2000.

An Integer Programming Formulation of the Probabilistic TSP in which All Nodes have Equal Probability of Coverage, INFORMS, Salt Lake City, May, 2000.

An Algorithm for the Local Truckload Vehicle Routing Problem with Strict Time Window Constraints, presented at the 79th meeting of the Transportation Research Board, Washington DC, January 2000.

Mixed Global and Locally Optimal Heuristics for Local Truckload Trucking Operations with Strict Time-Windows, presented at the 79th meeting of the Transportation Research Board, Washington DC, January 2000.

Freight Industry Attitudes Towards Policies to Reduce Congestion, presented at the 79th meeting of the Transportation Research Board, Washington DC, January 2000.

Impacts of Highway Congestion on Freight Operators: Perceptions of Trucking Industry Managers, presented at the 79th meeting of the Transportation Research Board, Washington DC, January 2000.

Local Truckload Vehicle Routing with Strict Time-Window Constraints, INFORMS, Philadelphia, November, 1999.

The Dynamic Traveling Repairman Problem: New Formulations, INFORMS, Philadelphia, November, 1999.

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Modeling issues in Dynamic Fleet and Freight Management, Invited presentation, University of California, San Diego, Department of Mathematics, June, 1999.
Real-Time Routing and Assignment for Trucking Operations, Optimization Days, Montreal, May, 1999.

Establishing the Industry Baseline, panel discussion, Cargo Network Services Conference, May, 1999.

Issues in Routing and Assignment for Trucking Operations, invited presentation, University of California, Irvine, April, 1999.

Freight Industry Attitudes Towards Policies to Reduce Congestion invited presentation, Portland State University, April, 1999.

Dynamic Routing and Assignment for Trucking Operations, invited presentation, University of Southern California, March, 1999.

Routing and Assignment for Local Trucking Operations Supporting Intermodal Operations, Presentation to Executives and Managers of JB Hunt Transport, Inc., Irvine, February, 1999.

Real-Time Routing and Assignment for Trucking Operations, invited presentation, University of Texas at Austin, February, 1999.

Freight Industry Attitudes Towards Policies to Reduce Congestion, presented at the 78th meeting of the Transportation Research Board, January, 1999.

Fleet Operators Perceptions of Congestion Problems and the Application of Advanced Technologies: Results from a Survey of 1200 Companies Operating in California, presented at the 78th meeting of the Transportation Research Board, January, 1999.

Fleet Operator Perceptions of Network Conditions & Variability: Implications for Operational & Planning Model Development, presented at the fall meeting of INFORMS, October, 1998.

Dynamic Assignment & Load Acceptance in Local & Long-Haul Pickup & Delivery Operations, presented at the fall meeting of INFORMS, October, 1998.

Dynamic Re-Sequencing and En-route Diversion Strategies for Carrier Fleet Operations: Simulation Investigation, TRISTAN III, San Juan PR, June, 1998.

Development and Evaluation of Dynamic Fleet Management Systems, Invited presentation, University of California, Berkeley, Spring Transportation Symposium, Feb, 1998.

Implementation and Evaluation of Dynamic Fleet Management Systems, Invited presentation, Federal Express Corporation, Memphis, January, 1998.

Evaluation of Dynamic Fleet Management Systems: A Simulation Framework, presented at the 77th meeting of the Transportation Research Board, January, 1998.

Evaluation of Operational Strategies for Dynamic Fleet Management, presented at the fall meeting of INFORMS, October, 1997.

Operational Strategies for Dynamic Dispatching of Carrier Fleet Operations, presented at the fall meeting of INFORMS, October, 1997.

Dynamic Fleet and Freight Management, Invited Presentation, University of Texas, Austin, September, 1997.

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Carrier Fleet Operations Under Real-Time Information: Dynamic Assignment and The Effect of Congestion, presented at the spring meeting of INFORMS, May, 1997.

Carrier Fleet Operations Under Real-Time Information: Insights and Applications, presented at the fall meeting of INFORMS, November, 1996.

Trucking Operations Under Real-Time Information: Insights and Applications, presented at the meeting of the International Federation of Operational Research Societies (IFORS), Vancouver, BC, July 1996.

Real Time Information For Improved Efficiency of Commercial Vehicle Operations: Operational Considerations And Simulation Insights, invited presentation, University of California, Irvine, May, 1996.

Fleet Management Strategies for Trucking Operations Under Real-Time Information, presented at the spring 1996 meeting of INFORMS, April, 1996.

Real Time Information for Improved Efficiency of Commercial Vehicle Operations: Operational Considerations and Simulation Insights, invited presentation, Texas A&M University, April, 1996.

Real Time Information for Improved Efficiency of Commercial Vehicle Operations: Operational Considerations and Simulation Insights, invited presentation, Georgia Institute of Technology, March, 1996.

Real Time Information for Improved Efficiency of Commercial Vehicle Operations: Operational Considerations and Simulation Insights, invited presentation, Northwestern University, February, 1996.

Real Time Information for Improved Efficiency of Commercial Vehicle Operations: Operational Considerations and Simulation Insights, invited presentation, University of Maryland, February, 1996.

Real Time Information for Improved Efficiency of Commercial Vehicle Operations: Operational Considerations and Simulation Insights, invited presentation, University of Kentucky, February, 1996.

Real-Time Information For Improved Efficiency of Commercial Vehicle Operations, presented in the seminar on doctoral student research at the 75th annual meeting of the Transportation Research Board, January, 1996.

Dynamic Fleet Management for Trucking Operations, presented at the fall 1995 meeting of INFORMS, October, 1995.

Carrier Fleet Management Models Under Real-Time Information, presented at and published in the proceedings of the EURO Working Group on Transportation, Barcelona, Spain, September, 1995.

Dynamic Vehicle Allocation Under Real Time Information: Operational Considerations and Potential Efficiencies, Fourth International Conference on Applications of Advanced Technologies in Transportation Engineering, Capri, Italy, June, 1995.

Demand Responsive Fleet Management: Problem Overview and Simulation Insights, Invited presentation, University of California at Davis ITS seminar series, June, 1995.

Dynamic Vehicle Allocation Under Real Time Information, presented at the spring 1995 meeting of INFORMS, Los Angeles, April, 1995

Emerging Technologies in Automatic Vehicle Location and Two-way Communication Systems for Common Carrier Operations, presented at the 1993 International Motor Carrier Symposium, May, 1993.

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List of Testifying Experience

Regal West Corp. v. Grapecity Inc., No. 3:11-cv-05415-BHS (W.D. Wash. 2011)

APPENDIX B (List of Materials Considered)

Exhibit	Description
EX1001	U.S. Patent No. 11,475,047
EX1002	U.S. Patent No. 11,475,047 File History
EX1003	Declaration of Dr. Amelia Regan
EX1004	U.S. Patent Pub. No. 2007/0075136 ("Jacob")
EX1005	Certified Translation of Japanese Patent Application Publication JP 2005-332346 ("Tamura")
EX1006	Japanese Patent Application Publication JP 2005-332346
EX1007	Certified Translation of Japanese Patent Application Publication JP 2002-104622 ("Kono")
EX1008	Japanese Patent Application Publication JP 2002-104622
EX1009	Franklin & Zdonik, "Dissemination-Based Information Systems," "*Bulletin of the Technical Committee on Data Engineering*," Vol. 19, No. 3 (September 1996) ("Franklin")
EX1010	U.S. Patent No. 7,996,265 ("Evangelist")
EX1011	U.S Patent No. 7,894,936 ("Walker")
EX1012	U.S. Patent Pub. No. 2006/0085296 ("Strickland")
EX1013	U.S. Patent Pub. No. 2002/0186144 ("Meunier")
EX1014	U.S. Patent No. 8,050,976 ("Staib")
EX1015	U.S. Patent No. 8,051,015 ("Veit")
EX1016	U.S. Provisional Patent App. No. 60/737,071 ("Staib Provisional Application")
EX1024	March 22, 2023 Affidavit of Nathaniel E. Frank-White (regarding Franklin)
EX1025	IEEE Technical Committee on Data Engineering, Data Engineering Bulletin Issues, available at http://sites.computer.org/debull/bull_issues.html
EX1026	Choi, S. and Kimes, S., "Electronic Distribution Channels' Effect on Hotel Revenue Management," Cornell Hotel and Restaurant Administration Quarterly, Vol.43, Issue 2, June 2002.
EX1027	Listing of Issues of Cornell Hotel and Restaurant Administration Quarterly, *available at* https://www.sciencedirect.com/journal/the-cornell-hotel-and-restaurant-administration-quarterly/issues.

EX1028	Screenshot of https://journals.sagepub.com/doi/abs/10.1177/0010880402433002 showing Electronic Distribution Channels' effect on Hotel Revenue Management
EX1029	Excerpts of Phillips, R., "Pricing and Revenue Optimization" (2005) ("Phillips")
EX1031	Excerpts of Phillips, R., "Pricing and Revenue Optimization" (2005) from Library of Congress from Copies 1 and 2 (including March 27 and 28, 2023 Declarations of Kyle Noreiga)
EX1032	March 22, 2023 Affidavit of Nathaniel E. Frank-White (regarding Phillips)

APPENDIX C (Claim Charts)

Claim Chart – U.S. Patent No. 11,475,047

Claim Limitation	Exemplary Prior Art Disclosures
1[pre][1,2] A computer-implemented method of managing online bookings for transportation services inventory, the computer-implemented method comprising:	**Jacob discloses a computer-implemented method** (*e.g.*, "computer program systems comprised of a series of code segments," implemented with "computer software or computer hardware or a combination of computer software and hardware," "computerized database") **of managing online bookings** (*e.g.*, "reservations") **for transportation services inventory** (*e.g.*, "method for managing time-dependent inventory such as hotel rooms, rental automobiles, and airline seats as well as associated items")**.** **Phillips discloses a computer-implemented method** (*e.g.*, "computerized reservation systems"; "computerized revenue management systems", "computerized pricing support system," "software systems," "computerized systems," "revenue management systems," "Pricing and revenue optimization systems")**, including in the context of managing online bookings** (*e.g.*, "on a hotel's own Web site," "Expedia/Travelocity," airline's "Web site," etc.) **for transportation services** (*e.g.*, "hotels," "ticket for… airline," etc.)**, using software to optimize and automate functions so they can be performed without human intervention** (*e.g.*, "software systems that solve the underlying optimization problem", "recommend actions based on sophisticated mathematical algorithms," "computerized systems to recommend actions based on sophisticated mathematical algorithms", "the majority of prices will

[1] Claim elements correspond to the listing in the Claim Appendix.

[2] To the extent deemed limiting, the preamble is disclosed.

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	be updated automatically" including "moment to moment")**.** "Pricing and revenue optimization systems." EX1029, 9. "Analyze Alternatives… Historically… involved analysts' use of spreadsheets…. More recently it has involved the use of software systems that solve the underlying optimization problem to recommend new prices for every element of the PRO cube." EX1029, 30. "Choose the best alternative… In very rapidly changing environments such as the passenger airlines, the majority of prices will be updated automatically, with analysts only investigating the unusual or unexpected situations." EX1029, 30. "The ***operational PRO activities work continuously to set and update prices in the marketplace***. The timing of the decisions will depend on the application—***airline revenue management systems can change fares from moment to moment.***" EX1029, 30.[3] "In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations." EX1029, 30.

[3] All emphases/annotations added unless noted.

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	"Much of the interest in pricing and revenue optimization has focused on its use of mathematical analysis. Quantitative analysis is indeed critical in most pricing and revenue optimization settings, but it cannot provide sustainable improvement unless it is embedded in the right process." EX1029, 30. "Here, the effects of the most recent actions should be monitored so that immediate action can be taken if necessary." EX1029, 31. "As we discuss in Chapter 3, the corporate goal in a product /segment /channel combination determines the form of the objective function that will be used when optimizing that "cell" of the PRO cube." EX1029, 32. "At this point, most companies consider adopting some sort of computerized pricing support system." EX1029, 33. "Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented." EX1029, 121. "computerized revenue management systems." EX1029, 122. "at the heart of these systems are the ***booking control mechanisms that determine moment by moment***

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	which fare classes are available for sale and which are not."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted.***" EX1029, 126. "Revenue management systems. The primary job of a revenue management system is to calculate and update the booking limits within the reservation system…receives a feed of bookings and cancellations from the reservations system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems." EX1029, 134-135. "The *forecasting module* generates and updates for all products/fare class combinations for all future dates… These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights.***" EX1029, 134-135. "Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function. These departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms." EX1029, 141. "While most companies have pretty good prices in place most of the time, very few have the processes and capabilities needed to ***ensure that they have the right***

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	prices in place for all their products, to all their customers, through all their channels, all the time. This is ***the goal of pricing and revenue optimization***." EX1029, 1. "The range of costs shown in Figure 6.4 represents a ***channel-pricing*** opportunity. It also provides an expanded opportunity for ***revenue management—airlines and hotels can establish fare classes based on the channel*** of a booking request ***and determine whether or not to provide availability through that channel***. Furthermore, it provides a tremendous economic incentive for revenue management companies to ***steer demand as much as possible through lower-cost channels***." EX1029, 137-138. "Incremental costs may vary by channel and market segment. In particular, commissions and distribution fees are important components of incremental cost in many revenue management industries. SABRE charges $3 to $4 per flight segment for an airline booking and about $4 per room for a typical hotel booking. In addition, travel agents receive a commission of about 10% for every booking they make. On the other hand, the variable cost of a ***direct reservation on a hotel's own Web site*** is about $1.50 (Marvel 2004). Figure 6.4 shows distribution costs for a $325 ticket sold through different channels for a major U.S. airline in 2002. The cost per booking varies from less than $10 for an opaque ticket to almost $45 for a booking sold through a travel agency." EX1029, 137.

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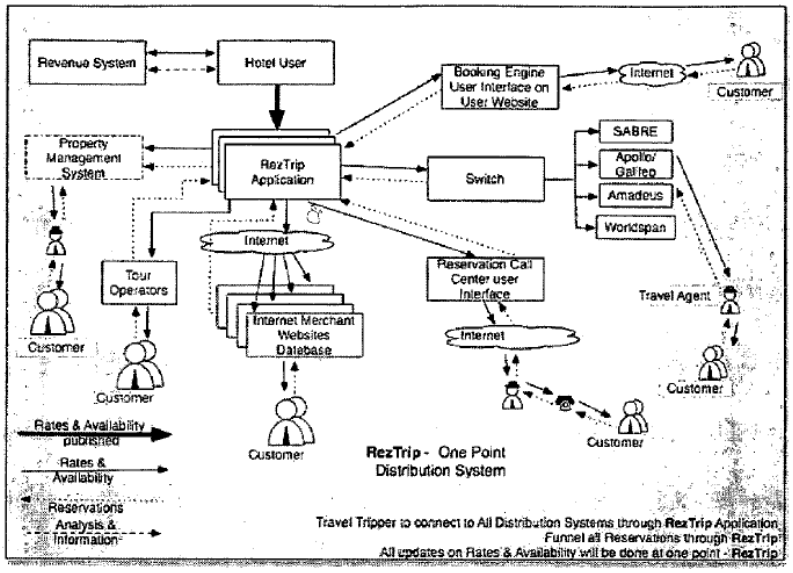
	distribution costs for "Expedia/Travelocity," "Web site," for "$325 ticket for a major U.S. airline". EX1029, Fig. 6.4 (p. 137). "A ***system and method for managing time-dependent inventory such as hotel rooms, rental automobiles, and airline seats as well as associated items is disclosed***. The system and method may be used to manage the price of inventory, the type of inventory, and the dates the inventory is offered for sale. The disclosed system and method simplify the management of inventory across multiple inventory types, inventory prices, and inventory availability dates by creating hierarchies and allowing changes to one element of a hierarchy to cause changes to other elements in the hierarchy." EX1004, Abstract. "The invention relates to the field of inventory management and distribution, specifically the management of time-dependent inventory such as hotel rooms, airline seats, rental automobiles, and other associated items." EX1004, ¶[0001]. "While the description that follows relates to hotel rooms, persons skilled in the art will realize that ***the problems described and solutions offered apply to rental items and time-dependent inventory generally***. The value of time-dependent inventory is a function of time. Yesterday's airline seat, yesterdays rental car, and yesterdays hotel room stay have no value today. Maximizing rental revenue relies on maximizing the use of rental property. One way to insure maximum use of time-dependent inventory is to take advantage of many different sales channels." EX1004, ¶[0002].

	"***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. ***The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" EX1004, ¶[0006]. "***In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations.*** The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations." EX1004, ¶[0009]. "As used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which

	manage data do so through their associated functions." EX1004, ¶[0078]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels**.** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the

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	invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." EX1004, ¶[0083]. "***Embodiments of the invention comprise a computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type

	data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." EX1004, ¶[0084].  Figure 7 EX1004, Fig.7

Jacob expressly discloses performing its various functions (*see, e.g.*, cl.1[h]-[i]) automatically (without needing human intervention), including, *e.g.*, "perform[ing]" price "calculations automatically" code segments "to analyze the information received from the sales channels," and/or receiving sale data relating

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to a sale price of each item. *E.g.*, EX1004, ¶¶[0005], [0006], [0010], [0131]-[0133]; cl.4 (*e.g.*, "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate"). To the extent it is argued further disclosure of automating the functions of Jacob is required, including so that they are performed automatically/without human intervention, **POSITA would at minimum have found it obvious based on Jacob in view of Phillips.**[4] Both Jacob and Phillips describe inventory management systems that allocate inventory to online distribution channels and that use sale data received from those channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0176], [0180]; EX1029, 9, 30, 33, 121-122, 134-135, 141. And Jacob discloses that a sales and inventory management system "should allow the administrator to change the pricing of all items… with a minimum of data entry by the staff." *E.g.*, EX1004, ¶[0005]. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed computer-implemented method of managing online bookings of inventory using Phillips's beneficial teachings of automating sales processes (including the analysis and "moment to moment" updating of inventory prices and allocations; *see also* cl.1[h]-[i].)** The combination would have advantageously increased the system's ability to monitor and track accurately each channel's revenue and inventory status, and, to the extent it is argued that it is required, allowed it to run automatically/without requiring human intervention, thereby permitting the system to better and more quickly adapt as described below—including, *e.g.*, to analyze whether and how prices/allocations should be adjusted to "maximize revenue" and whether/if a particular sales channel is in danger of running out of inventory or is out of inventory and to compare and determine accurately whether a particular channel is selling inventory better than other channels without having to wait for a human to perform calculations or otherwise provide input, and without introducing unnecessary human error. This would have furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" by, *e.g.*, increasing the efficiency of the system in responding to changing market conditions by adjusting prices and/or reallocating inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of inventory. *E.g.*, EX1004, ¶[0002]. This

[4] While this automaticity is disclosed (or, alternatively, rendered obvious) by Jacob alone, each of the Grounds discussed herein include Jacob-Phillips.

also would have reduced the response time/increased the speed of the system (by reducing the need to wait for and address user intervention), thereby allowing the system to more quickly address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory thus better "insur[ing] maximum use of time-dependent inventory." *E.g.*, EX1004, ¶¶[0002], [0005] (update prices with "minimum of data entry by the staff"). And it would have furthered Phillips's express goal of "pricing revenue and optimization" and to "ensure [companies] have the right prices in place for all their products, to all their customers, through all their channels, all the time." *E.g.*, EX1029, 1, 5 (discussing "pricing and revenue optimization (PHO) decisions" and the need to "manage and update prices in a fast-moving, highly transparent, online environment"), 7, 33 ("As price changes become more frequent and the pricing structure becomes more complex, it becomes less and less feasible for a company to apply in-depth analysis to each pricing decision… A common symptom is that despite expending more and more effort on pricing decisions, the company continually seems to be one step behind the market and the competition. At this point, most companies consider adopting some sort of computerized pricing support system."). This would also have minimized the need for costly human labor. For POSITA it would have been routine to make such an implementation choice, and (particularly in light of these disclosures) clear it would work and provide the expected functionality to yield predictable results with REOS.

1[a] establishing a channel interface that provides bidirectional communication between at least one server computing	**Jacob discloses establishing a channel interface** (*e.g.*, portion of "computer program system[]" (*see* cl.1[pre]) configured to manage communication between computers used by, *e.g.*, "hotel staff"/"employees" (with, *e.g.*, related "code segment[s]") including over a computerized network (*e.g.*, "wired or wireless networks")) **that provides bidirectional communication** (*e.g.*, enables "communications over wired or wireless networks"—*e.g.*, to permit hotel personnel to "set up"/"initially" "adminster[]" available hotel inventory "by entering relevant Property information" to be used by "reservation engine"/"RezTrip Application"; "delivers output to users, and accepts input from users";

device[5] and a vendor computing device[6];	"communicate[s] with the hotel staff") **between at least one server computing device** (*e.g.*, "[s]erver"/"computerized database" "implement[ing]" "RezTrip Application" (Fig.7)/"system to manage the sales, pricing, and inventory information related to time-dependent items") **and a vendor computing device** (*e.g.*, computer system of "Hotel User" (*see* Fig.7)[7] used by a hotel's "staff," employees, etc. to communicate "through a wired or wireless network" with, *e.g.*, "server"/"computerized database" "implement[ing]" "RezTrip Application"; "computer software or… hardware or a combination of computer software and hardware" used by "Superuser"/"Engine Administrator"/"Property Administrators" of "clients" (which can be "Individual Properties" or a "group of Properties") including "Companies who may not own Properties, but have bought batches of Rooms from other properties to sell to clients," "management company or chain that owns several properties," or "Portal," to "administer[]"/"manage" the "Property,"

[5] '047 states "'[c]omputer is any apparatus capable of carrying out data processing functions and includes a computer system, or a collection of one or more apparatus," EX1001, 37:58-62, and "'[s]erver' is a computer or other data processing apparatus that is capable of carrying out server side operations," EX1001, 38:4-5.

[6] '047 states "'vendor' is used broadly and can be interchanged with 'Property' as that word has been defined earlier" (EX1001, 31:1-3), and "Property is to be understood as a characteristic of the Rooms that makes comparison between the Rooms meaningful. For example, the rooms could be sourced from a common hotel franchise or from a particular geographical area," EX1001, 8:19-24. *See also* EX1001, 28:48-60.

[7] As discussed *infra,* POSITA would have understood the block of Fig.7 labeled "Hotel User" (like, *e.g.*, the "Revenue System" with which "Hotel User" exchanges data) to indicate a computer/system—not a person (like, *e.g.*, the "Customer," "Travel Agent," etc. illustrated in Fig.7 with icons indicating people).

	"group of properties," "batches of Rooms," "several properties," or "Portal")**.** **Tamura discloses establishing a channel interface** (*e.g.*, portion of "sales management server 20" and "merchandise distribution server 10" enabling "connect[ion]" between "sales management server 20" and "merchandise distribution server 10"/"connect[ion] to network" (*see* Fig.3); portion of "sales management server 20" and "merchandise distribution server 10" enabling "connect[ion]" between "sales management system 20"/"merchandise distribution server 10" and "sales rep part 50" (*see* Fig.3)) **that provides bidirectional communication** (*e.g.*, bidirectional communication links in Figs.1, 3; bidirectional communication links in Fig.3) **between at least one server computing device** (*e.g.*, "Merchandise distribution management server 10") **and a vendor computing device** (*e.g.*, "sales management system 20"; "sales rep part 50")**.** **Kono discloses establishing a channel interface** (*e.g.*, portion of "Market inventory control computer" and "DB server"/"database server" enabling communication via "LAN" to "Agency communication control computer") **that provides bidirectional communication** (*e.g.*, "acqui[sition]" of "information" by "DB server"; "acquiring product shipment information from the agency to the retail store and product inventory information of the agency"; "send instructions for product transfer from the maker-side server device") **between at least one server computing device** (*e.g.*, "Agency communication control computer") **and a vendor computing device**

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	(*e.g.*, "Market inventory control computer" and "DB server" (Fig.1)/"database server")**.** "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" EX1004, ¶[0006]. "***The system may be configured to communicate with the hotel staff, the hotel property management database, and a plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™, telephone reservation systems, a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems, and tour operators. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the***

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	sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." EX1004, ¶[0007]. "The system comprises a pricing code segment configured to allow the property administrators to manage room pricing information. The pricing code segment comprises the pricing functions. The prior art pricing change process is illustrated in FIG. 4. A property administrator wishing to change rates for rooms must manage each room type, rate type, date, and constraint type combination individually. As the number of room types, rate types, dates, and constraints grow, the task of changing and/or managing the information grows geometrically. As illustrated in FIG. 5, embodiments of the invention define a matrix of relationships between room types, rate types, and room constraints. The pricing code segment functions by basing room prices upon the price of a standard room offered at the best available rate (BAR). For example, a standard single occupancy room may be offered at a particular BAR. The hotel user then enters the rates of the other rooms as a function of the BAR. Double occupancy may command a rate of BAR plus an extra person charge, triple occupancy may command a rate of BAR plus 2 times the extra person charge. A deluxe room may be priced at 15% above BAR, or $50 above BAR, or some other figure based upon BAR. Prices based upon combinations of room type, occupancy, special discounts, group discounts, and preferred client pricing may be set. Once the matrix of the dependencies upon the BAR are set, the system can calculate the prices of the available rooms. The matrix of BAR dependencies needs only to be set once.

	Subsequent room pricing changes may be implemented by changing only BAR. The rest of the room prices and rates can be calculated automatically based upon the matrix of BAR dependencies. Individual room prices may be set manually, overriding prices calculated by the matrix of BAR dependencies. ***Once pricing changes have been implemented the results may be distributed through the communication code segment or code segments to the sales channels.*** By defining a matrix of relationships or hierarchies between room types, rate types, and constraints, embodiments of the invention allow PA's to modify one rate, for example the BAR rate of a standard room type, and have other rates (floating rates) automatically changed as illustrated in FIG. 6." EX1004, ¶[0008]. "In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations. ***The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations***." EX1004, ¶[0009]. "The system may further comprise a revenue management code segment. The ***revenue management code segment is used to analyze the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." EX1004, ¶[0010]. "As used herein Superuser, or SU, refers to the user or group of users that can perform every action in the

	system ***across any portal and Property that exist in the system***. The SU has complete authority to manage any function available in the system." EX1004, ¶[0064]. "As used herein an Engine Administrator, or EA is a user or group of users, similar to the Superuser, who can perform every action in the system, but only on properties and users which they have created in the system. An EA cannot view or edit details on properties/users created by other EA's." EX1004, ¶[0065]. "As used herein a Property Administrator or PA is a user or group of users who are the owners/***employees*** of ***properties that are managed with the system***. The PA is responsible for configuring and maintaining daily rates, the inventory, and the property features that show up via the reservation engine." EX1004, ¶[0066]. "As used herein ***a Portal refers to a Property or series of Properties managed as an entity. Users of the system may comprise owners of individual properties, owners of multiple properties, and others who may not own properties but instead agree to sell groups of rooms on a contract basis***. A direct Portal refers to all the Properties that are directly utilizing the services of the reservation engine. An indirect Portal refers to Properties that have contracted some or all of their rooms to an intermediary, and the intermediary has chosen to use the services of the reservation engine. A single physical Property can be part of either a direct portal or an indirect portal, or both. A portal is a logical grouping of rooms and/or properties that allows one

	person to manage groups of Properties/Rooms from a single point." EX1004, ¶¶[0069]-[0070]. "As used herein the Reservation Engine, Bookings Engine, and RezTrip™ Reservation Application refer to an application used by EU's to make reservations. One embodiment of the invention, RezTripTM, comprises a ***reservation engine*** for use by EUs, and an ***administrative application for use by hotel owners/employees***." EX1004, ¶[0071]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code

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	segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software. Embodiments of the invention may be located*** on one computer or ***on a plurality of computers connected to one another through a wired or wireless network***. ***Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser.*** User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript,

	VBScript, HTML, DHTML, CSS, and awk." EX1004, ¶[0083]. "***Embodiments of the invention comprise a computerized database such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data***. In addition, ***embodiments of the invention comprise code segments configured to interact with the database***, to interact with users (EU's, SU's, EA's, and PA's), ***and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks.***" EX1004, ¶[0084]. "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not

	intended to limit the invention to the specific embodiment described." EX1004, ¶[0085]. "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The data relating to the Property are stored in the system database. The EA or SU then associates a PA with the property. ***The PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies,*** and later by managing inventory and room rates. Once the PA has ***set up the Property within the system,*** EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property." EX1004, ¶[0086]. "Upon login the SU is presented with the option of ***picking the portal they want to work*** within as shown in FIG. 13; no other action is possible until a portal has been chosen. After choosing a portal, menu functions become available. While a SU may perform all system and property management functions, properties are generally managed by less privileged EA and PA users." EX1004, ¶[0088]. "The portal code segment is configured to manage Portal data and comprises Portal functions. ***A Portal refers to a Property or series of Properties managed as an entity.***" EX1004, ¶[0092].

	"The ***RezTrip™ application may have clients*** that comprise: A group of Properties Individual Properties Companies who may not own Properties, but have bought batches of Rooms from other properties to sell to clients. A management company or chain that owns several properties." EX1004, ¶¶[0093]-[0097]. "As shown in FIGS. 13, 14, and 15, the system allows SUs to select portals; create new portals, enter portal data, to edit portals, and to activate/inactivate portals. ***Portals are created, edited, and activated/inactivated by clicking on the appropriate menu items on the relevant screens and entering the required data in the forms. Each portal may have Properties and users created within it. The associations between a Property and users are performed within the scope of a portal. A Property from one portal cannot be associated with an EA or a PA from another portal.*** EAs operate within the portal with which they are associated. SUs may operate on any portal in the system." EX1004, ¶[0099]. "***During the course of working with a Property all SU, EA, and PA users are clearly shown the portal and the Property to which they are making changes.*** The administrative users (SU, EA, PA) have the ability to change Properties, to move from one Property to another. ***If the user is logged on as SU then the user***

	also has the ability to change portals." EX1004, ¶[0111]. "As shown in FIG. 17, the PA enters property data on the 'Add Property' screen. The data comprise address information including street, city, state, country, postal code, as well as radio buttons indicating whether to display special rate types, default amenities, default property facilities, default bed types, and default common room attributes. ***After a Property has been added to the system it may be managed by selecting it from the Property list, as shown in FIG. 18. Selecting a Property from the Property list brings up a form displaying the default Property information as shown in FIG. 19.*** Default information comprises reservation transaction fee, active/inactive status, low inventory alert level, guarantee/cancellation policy, minimum room price, default currency, default date format, and check-in/check-out times." EX1004, ¶[0113]. "Communicate the prices to a plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or communicate in response to a user initiated triggering event***, such as a mouse click." EX1004, ¶[0133]. "The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" EX1004, ¶[0185].

	"The ***communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions***. Once the Rate Types, Room Types, and inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels. Other information communicated to the selling channels may comprise add-on information, package information, amenity information, and facility information. ***The information is communicated to the selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click.*** As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such as the internet*** or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form." EX1004, ¶[0191]. "The reservation engine code segment is configured to manage reservation engine data and comprises reservation engine functions. ***When an EU, using the reservation engine, successfully completes a reservation, a confirmation is sent to the EU. The***

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	application also notifies the PA to allow the administrator to perform the associated financial and administrative tasks. The application sends confirmations to the EUs and notifications to the PA via communications over wired or wireless networks in either an encrypted or unencrypted form. Typically, the communications will comprise an electronic mail message or a facsimile message." EX1004, ¶[0192]. "The system of claim 1 further comprising ***a code segment configured to communicate pricing information and inventory information to a plurality of sales channels***." EX1004, cl.5; *see also* EX1004, cl.1. "The system of claim 5 further comprising ***a code segment to automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***." EX1004, cl.6.

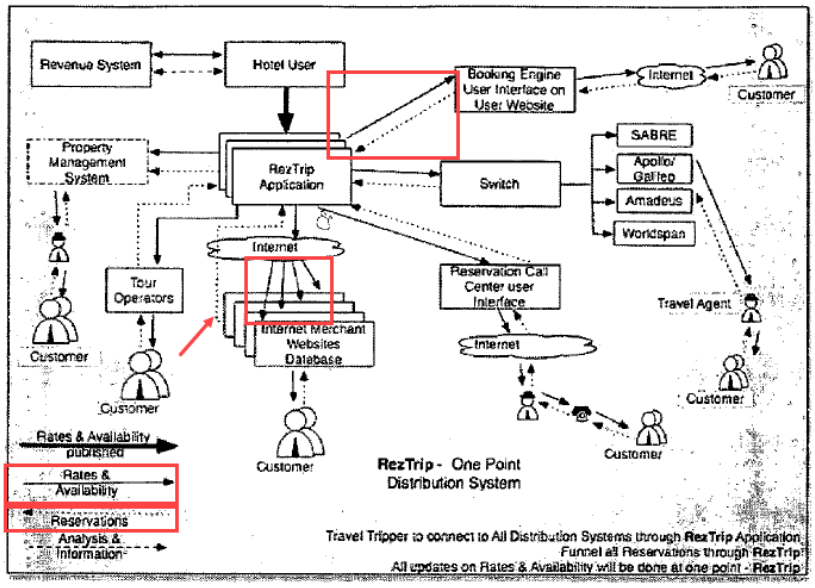


Figure 7

EX1004, Fig.7.

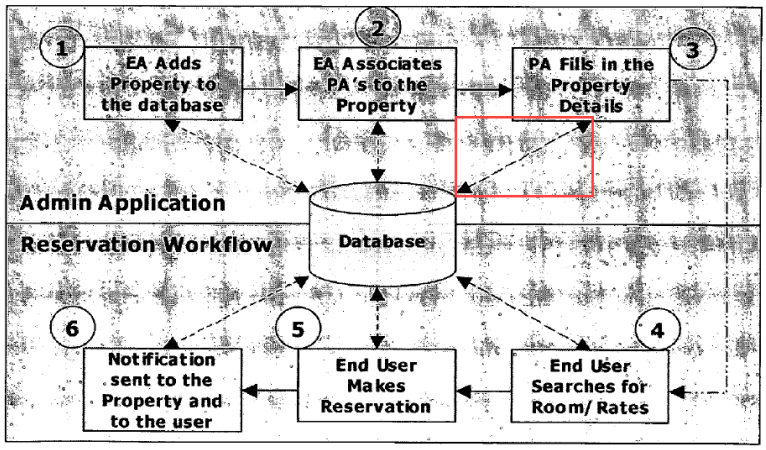


Figure 8

EX1004, Fig.8.

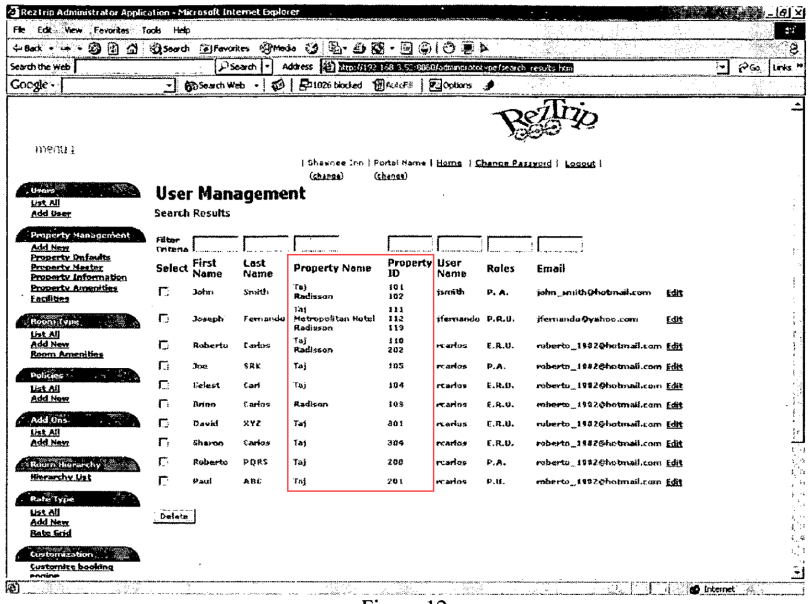


Figure 12

EX1004, Fig.12.

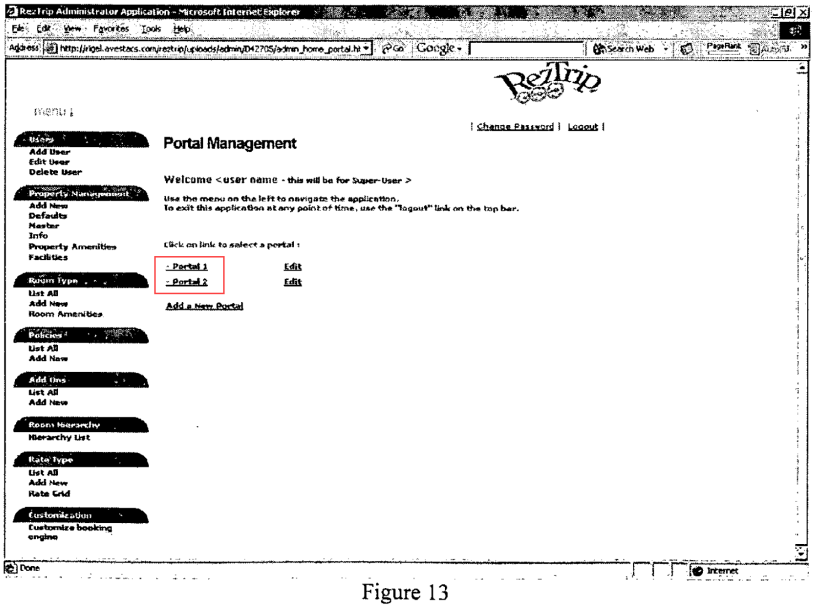


Figure 13

EX1004, Fig.13.

"Fig. 1 is a block diagram of the overall configuration of a sales management system illustrating a first embodiment of the invention. ***In the figure, the sales***

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	management system 20 is connected to a merchandise distribution management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period. For example, the server receives sales information from POS terminals at the retail stores, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise distribution management server 10 is also transmitted to the manufacturers' production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer's side, sales department personnel use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as to evaluate the selling capabilities of each retailer." EX1005, ¶[0017]. "Next, the time-of-sale purchase-price calculation unit 28 calculates the sold purchase price, based on the reference retail price, at the stage when the item purchased based on the allocation quantity is sold at each retail store (S108). Each time the item is sold, at each retail store, ***sales information is transmitted from the POS terminal to the sales management system 20***

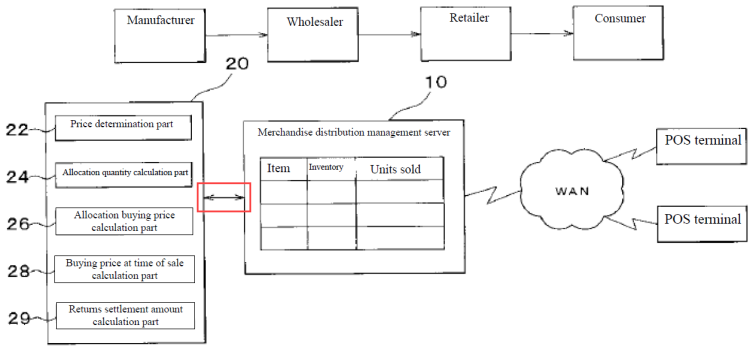
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	and the merchandise distribution management server 10." EX1005, ¶[0026]. "Fig. 3 is a block diagram of the general configuration of a sales management system which illustrates a second embodiment of the invention. This embodiment shows a situation in which merchandise is allocated not only by a merchandise planning entity such as a manufacturer, but also merchandise which is purchased by retailers that are handled as a group***. In the figure, the sales management system 20 is connected to the merchandise distribution management server 10, to the POS terminals installed in each retail store, and to a network, as well as to the supervisor part 40 and to the sales rep part 50.*** The sales management system 20 is designed to handle both merchandise allocated by a merchandise handling entity such as a manufacturer and merchandise which is purchased by retailers, and in addition to the value determination part 22, the allocation quantity calculation part 24, the allocation purchase price calculation part 26, the purchase price at time of sale calculation part 28, and the returned goods settlement amount calculation part 29 as described in Embodiment 1, the system also includes purchased merchandise quantity receiver part 32 and a purchased buying price calculation part 34." EX1005, ¶[0031]. "***The supervisor part 40 is authorized to manage the sales of merchandise purchased by the retailers based on the allocation quantities of the merchandise as set by the merchandise planning entity, and to manage the return of merchandise purchased by the retailers based on the allocation quantities using, for example, computers or information processing terminals which are connected to a communications network. The***

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supervisor part 40 is connected to a number of sales rep parts 50 within the scope of its management and can adjust the quantity of merchandise allocated to the retailers by the merchandise planning entity at any time based on information from the merchandise distribution management server 10 about the merchandise in question. The supervisor used by the supervisor part 40 is responsible for the sale of merchandise sent in by the merchandising entity; however, it is not responsible for sales performance of unsold merchandise ordered by retailers as merchandise which they have purchased. The supervisor's authority to transfer merchandise between retailers is underpinned by the fact that the allocation quantity of merchandise can be returned to the merchandising entity. In other words, the supervisor also has the authority to approve a retailer's request to return an allocated quantity of merchandise to the merchandising entity." EX1005, ¶[0034].

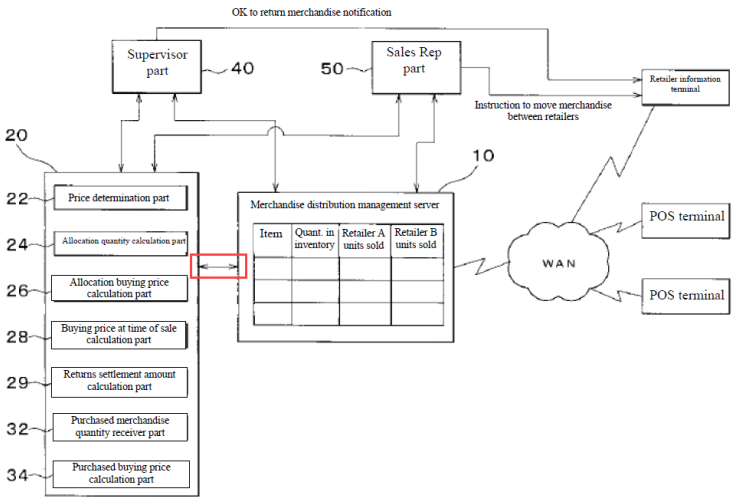
Fig. 1



EX1005, Fig.1.

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Fig. 3



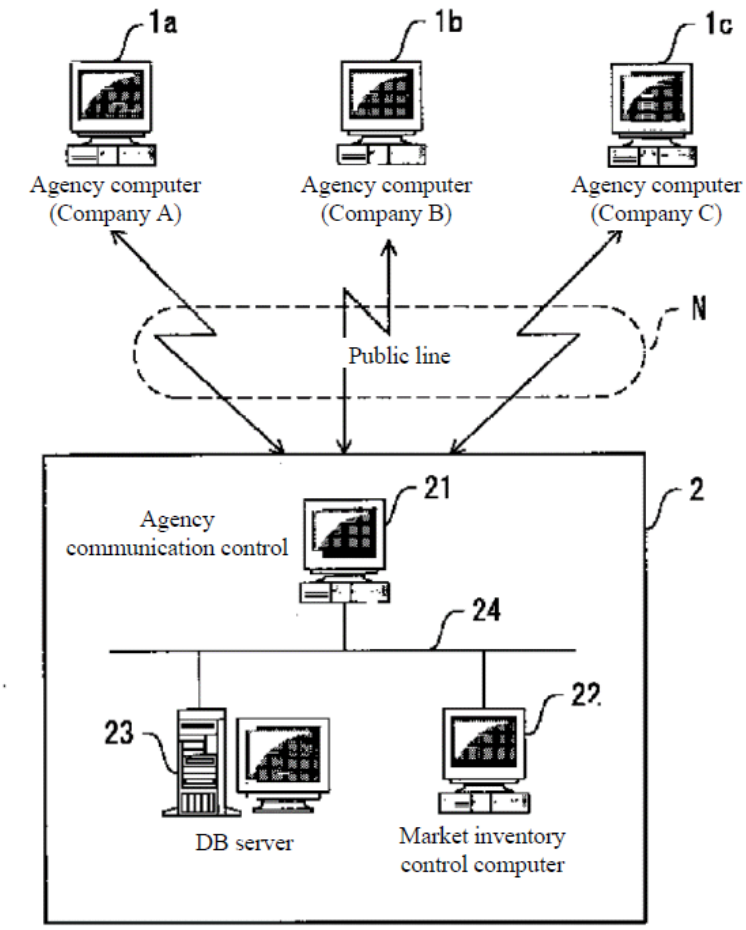
EX1005, Fig.3.

"This system is configured such that agency terminals 1a, 1b, 1c, ... installed at each agency having transactions and a server device 2 of the manufacturer (maker side) are connected via a network (public line) N. However, the agency terminals 1a, 1b, 1c, ... and the manufacturer server device (hereinafter referred to as the maker-side server device) 2 may be connected by a communication network such as the Internet." EX1007, ¶[0024].

"Moreover, ***the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like.*** Moreover, the market inventory control computer 22 is provided with: ***acquisition means of acquiring product shipment information from the agency to the retail store and product inventory***

	information of the agency from each agency terminal 1a, 1b, 1c, ...; analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency; and transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, ***instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instructing transfer between warehouses." EX1007, ¶[0025]. "These may be configured so as to ***send instructions for product transfer from the maker-side server device 2 to the agency-side terminals*** 1a, 1b, 1c, ..., or may be configured so that a sales representative of the maker directly presents the form to prompt transfer of the product. In this case, the agency side simply transfers the product within the normal routine scope of work to be a transfer between warehouses within the company. With regard to resale between different companies, the inventory information of the agency that is collected on a daily basis and the inventory information at each agency such as that illustrated in FIG. 4 are presented, and it is determined whether resale is necessary." EX1007, ¶[0046].

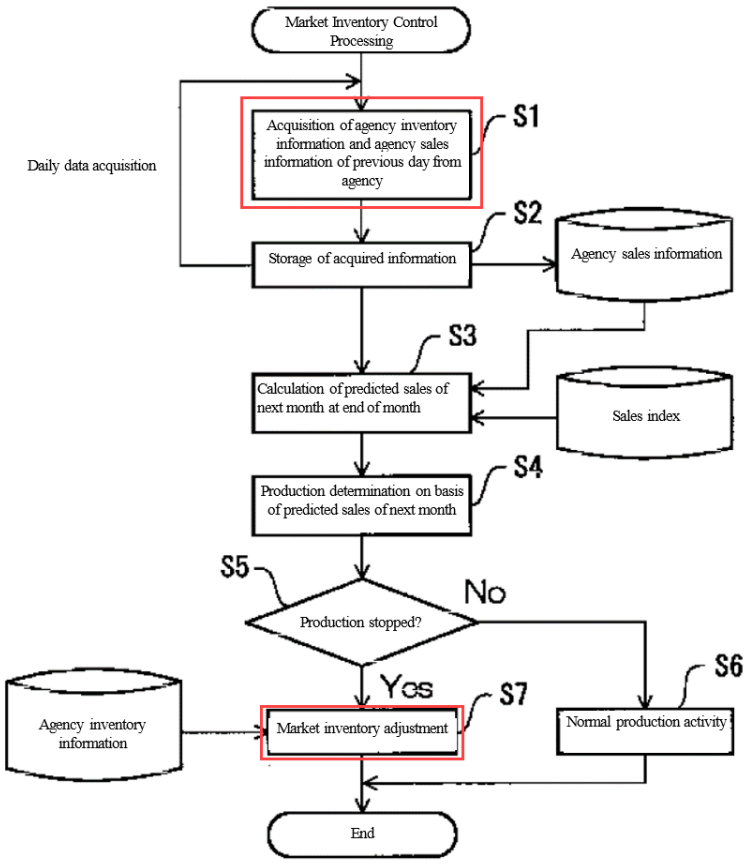
[FIG. 1]



EX1007, Fig.1 (showing "DB server").

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[FIG. 3]



EX1007, Fig.3.

Jacob expressly discloses its inventory management system (*e.g.*, computer/server running, *e.g.*, the "RezTrip" application ("RezTrip computer/server")) includes "computer software or computer hardware or a combination of computer software and hardware" used by personnel (*e.g.*, "Property Administrators") of Jacob's inventory-selling "clients" (*e.g.*, vendors such as "Individual Properties" or "a group of Properties") to "set up" and "administer[]" such Properties and to communicate property information to the RezTrip computer/server. *E.g.*, EX1004, ¶¶[0006], [0069], [0084]-[0086], [0093]-[0097], Figs.7-8. Jacob further discloses "[e]mbodiments" where its invention is "located… on a plurality of computers connected to one another through a wired or wireless network" (*e.g.*, EX1004, ¶[0082]), and POSITA would have understood

the block of Jacob's Fig.7 labeled "Hotel User" (like, *e.g.*, the "Revenue System" with which it exchanges data) to indicate a computer/system—rather than a person. *See* red annotation, *infra*. When, in contrast, Fig. 7 depicts a person (like, *e.g.*, a "Customer," "Travel Agent," etc.) it does so with an icon indicating people (*e.g.,* yellow annotations, *infra*):

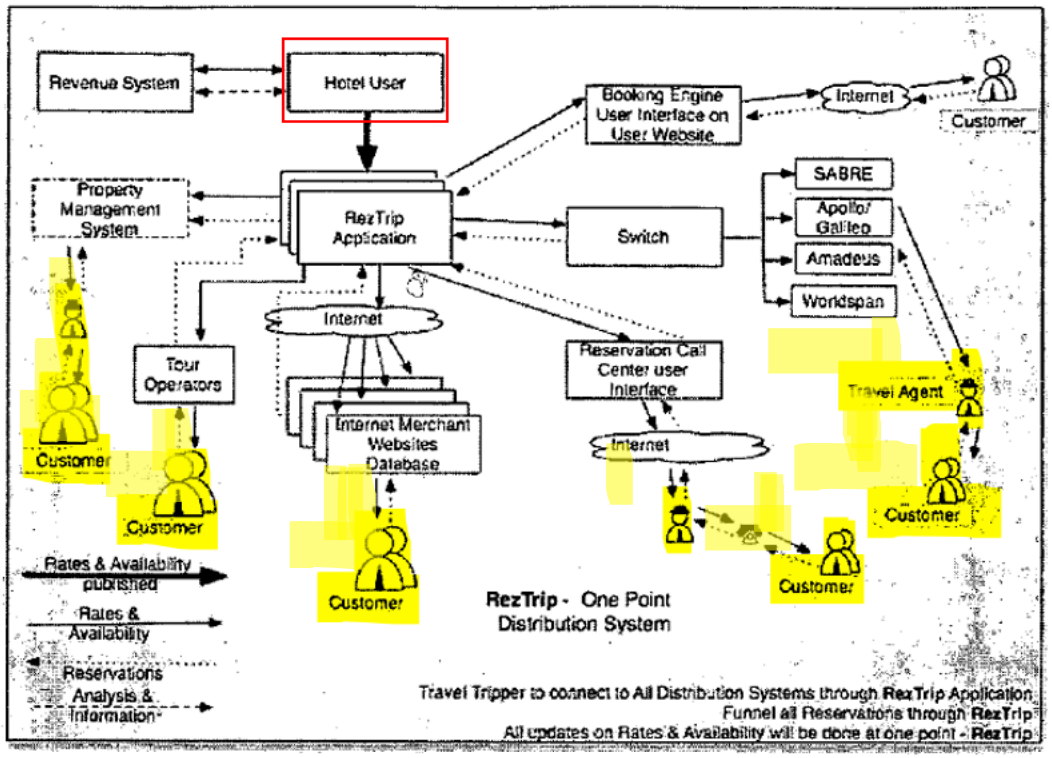


Figure 7

POSITA would thus have understood Jacob to disclose, expressly, a "vendor computing device." *See* n.6, *supra*.

To the extent it is argued further disclosure of a vendor computing device is required, at minimum, **this would have been obvious from Jacob (in the recited combinations).** As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and uses sale data received from those channels to more efficiently manage inventory and better adapt to market demand (*e.g.*, using Jacob's RezTrip application), and further discloses that the RezTrip application may have multiple "clients" (including, *e.g.*, "Individual Properties, "A group of properties," and "[a] management company or chain that owns several properties"). *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0093]-[0097],

[0176], [0180]. **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Jacob's disclosure that "[e]mbodiments of the invention may be located… on a *plurality* of computers connected to one another through a wired or wireless network," such that in the resulting system the multiple clients of the RezTrip application/owners of different properties or groups of properties each use their own vendor computing device (or multiple vendor computing devices) that exchanges information with, *e.g.*, a RezTrip computer/server (including its associated "database").** This would have enabled personnel of a client/property—*e.g.*, a hotel's administrator, staff, etc.—to connect (including remotely) to the RezTrip computer/server, and thus (using the hotel example for illustrative purposes only), among other things, beneficially: permit multiple hotel chain employees (and multiple hotel chains) in multiple locations to use a single shared server and database without requiring the RezTrip application and associated data to be replicated and constantly updated in its entirety in many separate locations; enabling the use overall of fewer (or just one) more powerful and faster—and, thus, more costly—computer/server installations running the RezTrip application; and allowing more updates to the RezTrip application and associated components to be done centrally/at fewer installations. Among other things, this would have further increased the system's speed and efficiency in managing property/inventory-related information, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory." This would also have beneficially facilitated communication and (to the extent desired and permitted) data sharing between and among Jacob's different owners/administrators of properties/groups of properties, or across properties/groups of properties with a common owner. For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See*, *e.g.*, EX1029, 33 ("computerized pricing support system"), 121 ("Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("Throughout the remainder of the 1980s and well into the 1990s, carriers such as United, Delta, and Continental invested millions of dollars in implementing computerized revenue management systems…."), Fig.6.1.

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Additionally, to the extent it is argued further disclosure of a "***server*** computing device" is required, **POSITA would have found this obvious from Jacob (in the recited combinations)**. As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and that uses sale data received from those channels to more efficiently manage inventory and better adapt to market demand, discloses the use of database servers (*e.g.*, Microsoft's relational database management system, "SQL **Server**™") "to manage hotel data" of the kinds input by hotel personnel for use by Jacob's RezTrip application, and further discloses that the RezTrip application may have multiple "clients" (including "Individual Properties, "A group of properties," and "[a] management company or chain that owns several properties"). *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0084] ("The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, [etc.]"), [0093]-[0097], [0176], [0180]. **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations (including its code segments, computer hardware/software, and database)) such that in the combined system the functions of the RezTrip computer/server are performed by a server computing device (including, *e.g.*, by a database server).** Implementing the RezTrip application on a server computing device would, *inter alia*, have beneficially provided the additional memory, processing capability, and accessibility by other software/processors that are made possible by servers, thus allowing the system to more quickly process and store data and make it available to the "plurality of computers connected to one another" that make up Jacob's disclosed system (as well as to other systems), thus allowing the system to work over a larger system topology with larger data sets (*e.g.*, sale data), to more simply bring in external data for use in its analyses, and to respond more quickly to changing market dynamics, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory." *See also* EX1004, ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it

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would work and provide the expected functionality to yield predictable results with REOS.[8]

To the extent it is argued further disclosure of a vendor computing device is required, at minimum, **this would have been obvious from Jacob (in the recited combinations) in view of Tamura.** Both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. Jacob further discloses receiving sale data such as "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate." EX1004, ¶¶[0086], [0123]-[0125], [0176], [0192]. As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and uses sale data received from those channels to more efficiently manage inventory and better adapt to market demand (*e.g.*, using Jacob's RezTrip application), and further discloses that the RezTrip application may have multiple "clients" (including, *e.g.*, "Individual Properties, "A group of properties," and "[a] management company or chain that owns several properties"). *E.g.*, EX1004, ¶¶[0001]-[0002], [0093]-[0097], [0176], [0180]. Tamura discloses "merchandise distribution management server 10," which performs functions of Tamura's system such as "record[ing] the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period," (*e.g.*, EX1005, ¶[0017]), and which POSITA would have understood is a "server computing device." Tamura further discloses a "sales management system 20," which is "installed in," *e.g.*, a "manufacturer's sales department" and includes components to, *e.g.*, determine a reference retail price

[8] POSITA's REOS here and for all of the obviousness arguments herein is further confirmed by this technology's predictability. As discussed above in my declaration (§V), POSITA would have been well aware of all the hardware and software used in the combinations discussed herein—*e.g.*, server computing devices were well known in the art. *E.g.*, EX1013, ¶[0156] ("CRMLS is comprised of one or several networked computer servers capable of rapidly processing a high volume of operations."); EX1011, 5:6-12 (discussing "server"); EX1004, ¶[0084] ("Embodiments of the invention comprise a computerized database such as… **SQL Server™**").

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for" inventory items "based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10" (*e.g.*, EX1005, ¶¶[0018]-[0019]), and which POSITA would have understood is a "vendor computing device." Tamura additionally discloses "sales rep part 50," which "manages the sales progress rate for each retailer" and "has the authority to transfer items from a retailer with a low sales progress rate in relation to the allocation quantity to retailers with a high sales progress rate," (*e.g.*, EX1005, ¶[0035]), and which POSITA would have understood is a "vendor computing device." **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Tamura's beneficial disclosures of a server computing device (*e.g.*, "merchandise distribution management server 10") and vendor computing devices (*e.g.*, "sales management system 20" and "sales rep part 50")**. Implementing the RezTrip application on a **server** computing device (such as Tamura's "merchandise distribution server 10") would, *inter alia*, have beneficially provided the additional memory, processing capability, and accessibility by other software/processors that are made possible by servers, thus allowing the combined system to more quickly process and store data and make it available to the "plurality of computers connected to one another" that make up Jacob's disclosed system (as well as to other systems), thereby enabling the system to work over a larger system topology with larger data sets (*e.g.*, sale data), to more simply bring in external data for use in its analyses, and to respond more quickly to changing market dynamics, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" (*e.g.*, EX1004, ¶[0002]) and Tamura's express goal of "reducing lost sales opportunities," *e.g.*, EX1005, ¶¶[0001], [0009]). *See also* EX1004, ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). Additionally, implementing the combined system using Tamura's beneficial disclosure of **vendor computing devices** would have enabled personnel of a client/property—*e.g.*, a hotel's administrator, staff, etc.—to connect (including remotely) to the RezTrip computer/server, and thus (using the hotel example for illustrative purposes only), among other things, beneficially: permit multiple hotel chain employees (and multiple hotel chains) in multiple locations to use a single shared server and database without requiring the RezTrip application and associated data to be replicated and constantly updated in its entirety in many separate locations; enabling the use overall of fewer (or just

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one) more powerful and faster—and, thus, more costly—computer/server installations running the RezTrip application; and allowing more updates to the RezTrip application and associated components to be done centrally/at fewer installations. Among other things, this would have further increased the system's speed and efficiency in managing property/inventory-related information, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Tamura's express goal of "reducing lost sales opportunities." This would also have beneficially facilitated communication and (to the extent desired and permitted) data sharing between and among Jacob's different owners/administrators of properties/groups of properties, or across properties/groups of properties with a common owner. For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See*, *e.g.*, EX1029, 33 ("computerized pricing support system"), 121 ("Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("Throughout the remainder of the 1980s and well into the 1990s, carriers such as United, Delta, and Continental invested millions of dollars in implementing computerized revenue management systems…."), Fig.6.1.

To the extent it is argued further disclosure of a vendor computing device is required, at minimum, **this would have been obvious from Jacob (in the recited combinations)[9] in view of Kono.** Both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). As discussed, Jacob describes an inventory management system that allocates transportation services inventory to distribution channels and uses sale data received from those channels to more efficiently manage inventory and better adapt to market demand (*e.g.*, using Jacob's RezTrip application), and further discloses that the RezTrip application may have multiple "clients" (including, *e.g.*,

[9] Although I use the phrase "in the recited combinations," this phrase does not refer to a combination of Tamura and Kono except for cl.1[i], cl.4[i], and the dependent claims.

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"Individual Properties, "A group of properties," and "[a] management company or chain that owns several properties"). *E.g.*, EX1004, ¶¶[0001]-[0002], [0093]-[0097], [0176], [0180]. Kono discloses "Agency communication control computer," which facilitates communications between Kono's sales channels (*e.g.*, "agencies") and its "DB server" and "Market inventory control computer," (*e.g.*, EX1007, ¶[0025]), and which POSITA would have understood is a "server computing device." Kono further discloses a "Market inventory control computer," which, *e.g.*, acquires product shipment information from the agency to the retail store and "performs a sales analysis at each agency," (*e.g.*, EX1007, ¶[0025), and which POSITA would have understood is a "vendor computing device." Kono additionally discloses a "DB server," (*i.e.*, "database server"), which stores information such as "agency inventory information," and "agency sales information," (*e.g.*, EX1007, ¶[0026], Fig.2), and which POSITA would have understood is a "vendor computing device." **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Kono's beneficial disclosures of a server computing device (*e.g.*, "Agency communication control") and vendor computing devices (*e.g.*, "Market inventory control computer" and "DB server")**. Implementing the RezTrip application on a **server** computing device (such as Kono's "Agency communication control") would, *inter alia*, have beneficially provided the additional memory, processing capability, and accessibility by other software/processors that are made possible by servers, thus allowing the combined system to more quickly process and store data and make it available to the "plurality of computers connected to one another" that make up Jacob's disclosed system (as well as to other systems), thus allowing the system to work over a larger system topology with larger data sets (*e.g.*, sale data), to more simply bring in external data for use in its analyses, and to respond more quickly to changing market dynamics, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" (*e.g.*, EX1004, ¶[0002]) and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" and reducing "unnecessary inventory on the market," *e.g.*, EX1007, Summary, ¶[0011]. *See also* EX1004, ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). Additionally, implementing the combined system using Kono's beneficial disclosure of **vendor computing devices** would have enabled personnel of a

client/property—*e.g.*, a hotel's administrator, staff, etc.—to connect (including remotely) to the RezTrip computer/server, and thus (using the hotel example for illustrative purposes only), among other things, beneficially: permit multiple hotel chain employees (and multiple hotel chains) in multiple locations to use a single shared server and database without requiring the RezTrip application and associated data to be replicated and constantly updated in its entirety in many separate locations; enabling the use overall of fewer (or just one) more powerful and faster—and, thus, more costly—computer/server installations running the RezTrip application; and allowing more updates to the RezTrip application and associated components to be done centrally/at fewer installations. Among other things, this would have further increased the system's speed and efficiency in managing property/inventory-related information, thereby furthering Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" and reducing "unnecessary inventory on the market." This would also have beneficially facilitated communication and (to the extent desired and permitted) data sharing between and among Jacob's different owners/administrators of properties/groups of properties, or across properties/groups of properties with a common owner. For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See*, *e.g.*, EX1029, 33 ("computerized pricing support system"), 121 ("Computerized reservation systems and global distribution systems play major roles in the way that revenue management is actually implemented."), 122 ("Throughout the remainder of the 1980s and well into the 1990s, carriers such as United, Delta, and Continental invested millions of dollars in implementing computerized revenue management systems…."), Fig.6.1.

1[b] storing, via a channel data structure, a channel record for each of a plurality of distribution channels;	**Jacob discloses storing** (*e.g.*, "store[]")**, via a channel data structure** (*e.g.*, "database" stored in "computer readable medium"/"hard disk storage")**, a channel record** (*e.g.*, record for a channel stored in "database configured to manage hotel data" comprising, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and

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	"other data") **for each of a plurality of distribution channels** (*e.g.*, "sales channels"/"selling channels" (including, *e.g.*, "web sites such as Expedia™, or Travelocity™," "global distribution systems (GDS's) such as Apollo™ or Sabre™," "other computerized reservations systems," "application used by EU's to make reservations," "Internet Merchant Website[]," (Fig.7) "internet web merchant[]," "User Website," (Fig.7) "major travel reservation systems," and "hotel's own website"))**.** **Tamura discloses storing** (*e.g.*, "stor[ing]"; "recording")**, via a channel data structure** (*e.g.*, data stored on "merchandise distribution management server"/"sales management system")**, a channel record** (*e.g.*, "merchandise distribution information"/"figures stored in the merchandise distribution management server" comprising, *e.g.*, "item," "quant. in inventory," (Fig.3) "Retailer A units sold," (Fig.3) "Retailer B units sold" (Fig.3)) **for each of a plurality of distribution channels** (*e.g.*, "retailers") (*see* Fig.3)**.** **Kono discloses storing** (*e.g.*, "acquired product sales information," "product inventory information" "is stored")**, via a channel data structure** (*e.g.*, "agency inventory information database"; "agency sales (shipping) information database"; "form for performing an inventory analysis")**, a channel record** (*e.g.*, record for an agency comprising, *e.g.*, "agency sales information"; "agency inventory information") **for each of a plurality of distribution channels** (*e.g.*, "agencies") (*see* Fig.4)**.**

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	"Today several sales channels are available to hotels as shown in FIGS. 1, 2 and 3. ***Rooms may be booked*** *directly through the hotel's reservation staff,* ***through the hotel's web site, through consolidator web sites such as Expedia™ or Travelocity™****, through tour operators,* ***through travel agents using global distribution systems such as Sabre[]™ or Apollo™****, through telephone reservation services providers,* ***and through other computerized reservations systems.*** The wide variety of sales channels has brought great benefits to consumers as well as hotels, however the growth in the number of sales channels has created a sales and inventory management problem." EX1004, ¶[0003]. "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. ***The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" EX1004, ¶[0006].

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	"The system may be configured to communicate with the hotel staff, the hotel property management database, and a ***plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™,*** *telephone reservation systems,* ***a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems,*** *and tour operators*. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." EX1004, ¶[0007]. "As used herein a GDS, or Global Distribution System, is a term used for major travel reservation systems (such as Apollo™, Sabre™, Worldspan™) which have a worldwide presence and were originally designed to provide reservations for the airline industry. Approximately 500,000 travel agents have access to these systems, which have been extended to allow bookings for the hotel/travel industry…. As used herein End User, or EU refers to the users who come to a Property website, search for rooms, and optionally make a reservation. An EU may be a hotel customer or a travel agent using a GDS, a tour operator, a telephone reservation center worker, or other person using the system to make a reservation." EX1004, ¶[0063]. "***As used herein the Reservation Engine, Bookings Engine, and RezTrip™ Reservation Application refer to an application used by EU's to make reservations.***

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	One embodiment of the invention, RezTrip™, comprises a reservation engine for use by EUs, and an administrative application for use by hotel owners/employees." EX1004, ¶[0071]. "As used herein a Sales Channel or Selling Channel refers to a wholesale or retail selling channel. Sales channels may comprise GDS system, telephone reservations systems, tour operators, ***hotel web sites***, ***consolidator web sites such as Expedia™ or Travelocity™.***" EX1004, ¶[0077]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the

	system and a plurality of sales channels**.** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript,

	VBScript, HTML, DHTML, CSS, and awk." EX1004, ¶[0083]. "***Embodiments of the invention comprise a computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." EX1004, ¶[0084]. "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described." EX1004, ¶[0085].

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	"A hotel pricing and inventory management system comprising: ***a database configured to manage hotel data***; a code segment configured to manage user interaction; a code segment configured to manage portal data; a code segment configured to manage property data; a code segment configured to manage room type data; a code segment configured to manage room hierarchy data; a code segment configured to manage rate type data; a code segment configured to manage rate grid data; a code segment configured to communicate with a plurality of selling channels." Jacob cl.1.

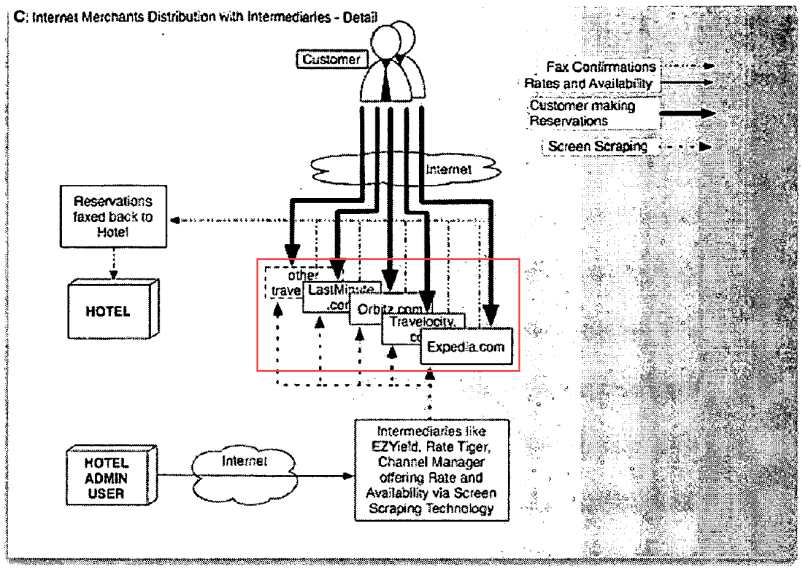


Figure 3

EX1004, Fig.3 (showing ***prior art*** systems with internet sales channels such as "LastMinute.com," "Orbitz.com," "Travelocity.com," and "Expedia.com").

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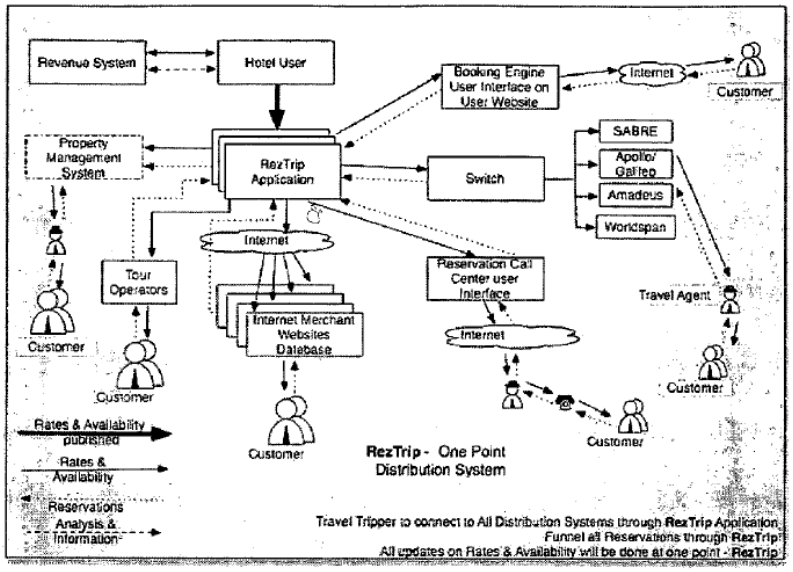


Figure 7

EX1004, Fig.7

"The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step***: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100); a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold

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	quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." EX1005, ¶[0014]. "Fig. 1 is a block diagram of the overall configuration of a sales management system illustrating a first embodiment of the invention. ***In the figure, the sales management system 20 is connected to a merchandise distribution management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period.*** For example, the server receives sales information from POS terminals at the retail stores, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise distribution management server 10 is also transmitted to the manufacturers' production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer's side, sales department personnel use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as to evaluate the selling capabilities of each retailer." EX1005, ¶[0017].

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	"The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10.*** For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and with reference to the merchandise's distribution market." EX1005, ¶[0019]. "The allocation quantity calculation part 24 calculates the allocation quantity of the item for each retailer. In principle, the quantity to be allocated is determined based on the actual sales of each item sold by each retailer as stored in the merchandise distribution management server 10, but regional factors and customer base are also taken into consideration. For example, a 10% increase is determined based on regional factors, and a further 5% increase is determined based on the customer base. As a result, each retailer will, in principle, purchase merchandise in accordance with the allocation determined by the allocation calculation part 24. The incentive for retailers is to purchase more merchandise if they find that the merchandise is a strong seller. However, since the number of orders placed by retailers is not accepted

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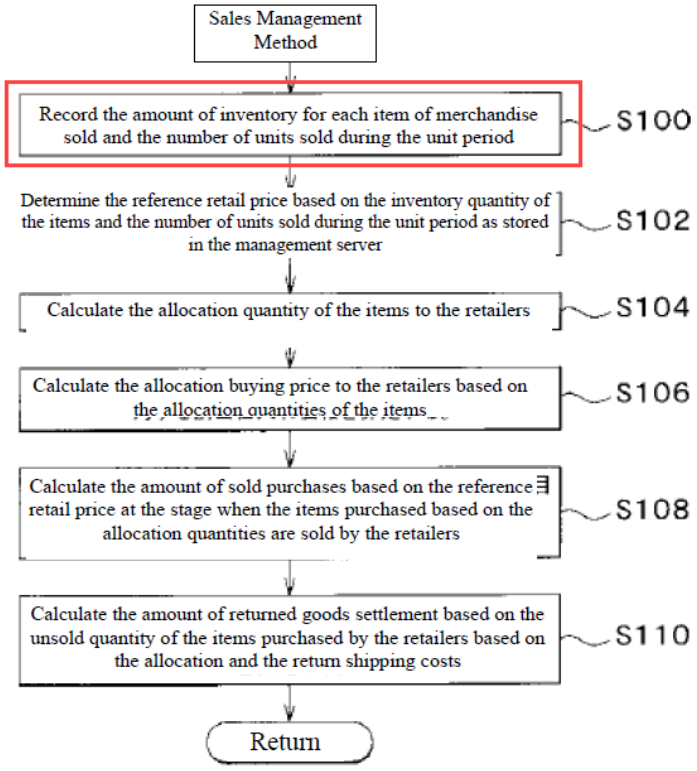
	for the allocated merchandise, retailers need to constantly improve their sales performance and ensure that the figures stored in the merchandise distribution management server 10 are good." EX1005, ¶[0020]. "Next, the price determination part 22 sets a reference retail price ***based on the inventory quantity of the item in question and the number of units sold during the unit period as stored in the merchandise distribution management server 10*** (S102). The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based on the allocation buying price and the allocation quantity of the item." EX1005, ¶[0025], "A sales management system comprising: a price determination part that determines the reference retail price of an item for sale ***based on the inventory and the number of items sold during the unit period for each item for sale, which is stored in a merchandise distribution management server***; an allocated quantity calculation part that calculates the allocated quantity of the items for each retailer; an allocated stocking price calculation part that calculates the allocated stocking price for each retailer based on the allocated quantity of the item calculated by the allocated quantity calculation part; a time of sale stocking price calculation part that calculates the stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each

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	retailer; and a returned goods settlement amount calculation part that calculates the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity." EX1005, cl.1. "A sales management method for executing each step using a computer: ***recording the inventory and the number of units sold during the unit period for each item of merchandise for sale***; determining the reference retail price based on the inventory and the number of units sold during the unit period of the item as stored in the management server; calculating the allocated quantity of the items for each retailer; calculating the allocated stocking price of the items for each retailer based on the allocated quantity of the items; calculating stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and calculating the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity." EX1005, cl.5.

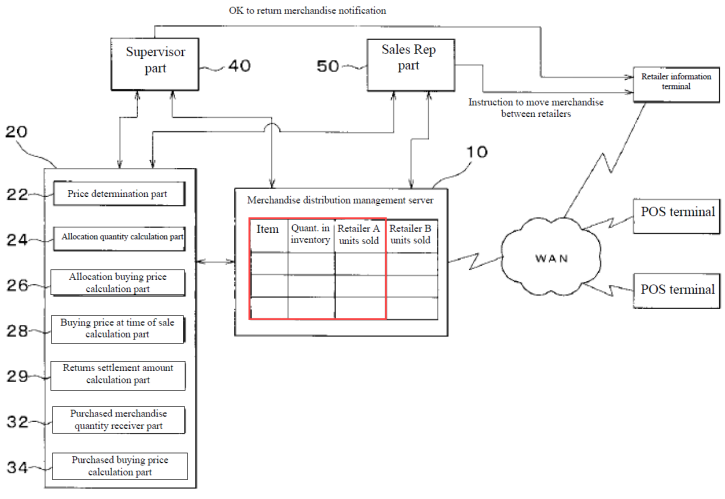
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Fig. 2



EX1005, Fig.2.

Fig. 3



EX1005, Fig.3.

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	"[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, ***the manufacturer server device is provided with***: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; ***analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency***; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses. Moreover, the above configuration is further provided with: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and the ***sales index of each agency stored in the agency shipment information database*** and the sales index database, estimate the sales volume of the product on the overall market and ***performs a sales analysis at each agency***." EX1007, ¶[0009]. "According to the present invention having such characteristics, by connecting the manufacturer server

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	device and the terminals of each agency by a direct network, ***the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each agency in real time***. The manufacturer server device estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and monthly sales index data of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, transfer (resale, etc.) of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." EX1007, ¶[0010]. "According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network***, can acquire product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time***. The maker estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and sales index of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." EX1007, ¶[0014].

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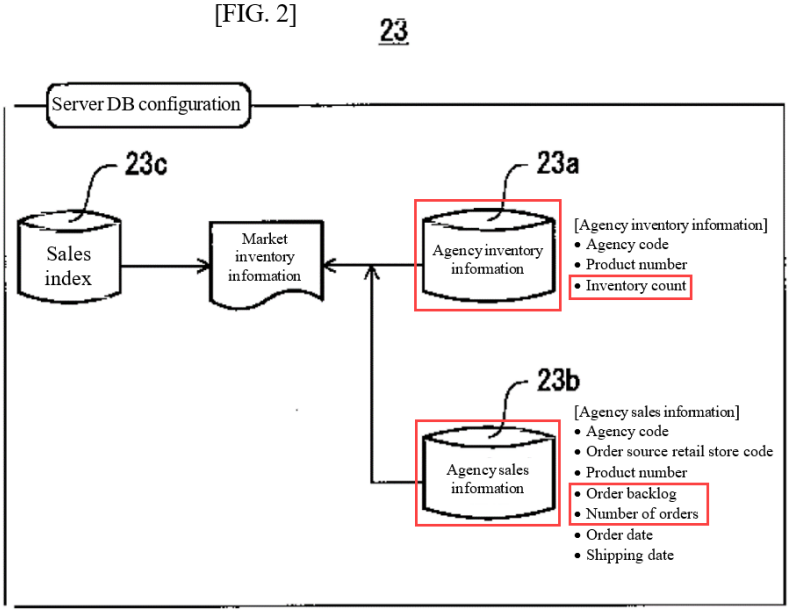
	"Moreover, according to the market inventory control method of the present information, in the third stage, when transferring inventory product between agencies, a response is made by resale of the inventory product from the agency where sales have fallen to the agency that still sells, and only the distribution cost required for resale is borne by the manufacturer." EX1007, ¶[0020]. "Moreover, the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like. Moreover, the market inventory control computer 22 is provided with: acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency from each agency terminal 1a, 1b, 1c, ...; ***analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency***; and ***transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instructing transfer between warehouses." EX1007, ¶[0025]. "FIG. 2 illustrates an example of various databases controlled by the database server 23. Three kinds of databases controlled by the database server 23 are

	prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the agency sales information database 23b. Moreover, ***monthly sales indexes of the previous year and current year are saved in the sales index database 23c***. In the database server 23, these data are updated daily so that ***the data can be stored and analyzed***. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software." EX1007, ¶[0026]. "***A maker-side server device 2 acquires, on a daily basis, product shipping (sales) information of the day before from the agency to the retail store and product inventory information of the day before of the agency from each agency terminal 1a, 1b, 1c, ... (step S1). The acquired product sales information is stored in the agency sales information database 23b of the database server 23, and the product inventory information is stored in the agency inventory information database 23a of the database server 23 (step S2). In this manner, daily information is stored and, at the end of the month, the maker-side server device 2 calculates the predicted sales volume of the next month (step S3).*** This calculation is as already described above. Thereafter, on the basis of the calculated predicted sales volume for the next month, a determination is made as to whether to perform or stop production of the product (steps S4, S5). The determination criterion at this time is determined by

	whether the predicted sales volume is on a decreasing trend and the sales volume matches the production cost. As a result, if even one of these conditions is resolved (if No is determined at step S5), the operation proceeds to step S6, and normal production activity is performed as before." EX1007, ¶[0039]. "The market inventory control system according to claim 1, further comprising: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and ***the sales index of each agency stored in the agency shipment information database and the sales index database***, estimate the sales volume of the product on the overall market and performs a sales analysis at each agency." EX1007, cl.2. "An explanatory diagram illustrating an example of a form for performing an inventory analysis of an agency." EX1007, Brief Description of Drawings.

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[FIG. 2]



[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

EX1007, Figs.2, 4.

Jacob expressly discloses this limitation. For example, Jacob discloses an inventory management and distribution system that stores—in, *e.g.*, a "computerized…relational database[]"—the system's data, including *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data." *E.g.*, EX1004, ¶[0084]. Jacob further discloses that its system comprises code segments (stored on, *e.g.*, "a computer readable medium," (*e.g.*, EX1004, ¶[0082]), to, *e.g.*, "communicate with other systems, such as sales systems (sales channels)," (*e.g.*, EX1004, ¶[0084]), such as "web sites"/"Internet Merchant Website"/"internet web merchants"/a "hotel's own website" (*e.g.*, EX1004, ¶¶[0007], [0077], [0085], Fig.7). Jacob further discloses

that its, *e.g.*, RezTrip computer/server is "configured to run on general purpose computers," that its general purpose computers include "hard disk storage," and that its system "comprises a computerized database" (*e.g.*, EX1004, ¶¶[0083]-[0084]), that its system communicates, *inter alia*, "pricing and inventory information to the sales channels" (*e.g.*, EX1004, ¶[0185]), and that its system receives and processes information from the channels to make channel-specific determinations over time, *e.g.*, "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels" (*e.g.*, EX1004, ¶[00180], cls.1[h]-[i], 2). **POSITA would thus have understood that Jacob expressly discloses that its system stores, via a channel data structure (including, *e.g.*, as data accessible in a "relational database[]"), a channel record for *each* of a plurality of distribution channels.** At minimum, **POSITA would have understood that Jacob's RezTrip computer/server necessarily, and thus inherently, stores, via a channel data structure, a channel record for each of a plurality of distribution channels, to facilitate computerized storage in Jacob's disclosed databases of channel-specific information to which it requires access over time (*e.g.*, to determine "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels"), and to facilitate communications with Jacob's plurality of distribution channels, including the storage and communication of pricing and inventory information over, *e.g.*, "wired or wireless networks."** To the extent it is argued that further disclosure is required, **POSITA would at minimum have found it obvious, straightforward, and advantageous to implement Jacob's disclosed RezTrip computer/server (in the recited combinations) such that it stores, via a channel data structure, a channel record for *each* of a plurality of distribution channels.** This would have, *e.g.*, facilitated consistent, automatic storage and more accurate tracking of, *e.g.*, initial inventory allocations, and ongoing reallocations and sales and inventory levels, and storing and modifying of pricing information and other data by, *e.g.*, the RezTrip computer/server, as well as facilitated efficient and automatic communication of such data to Jacob's plurality of sales channels (and receipt of data from such channels), thereby furthering Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" while minimizing the data entry required by, *e.g.*, hotel staff and "insur[ing] that each sales channel would always be working with the most up-to-date pricing, availability, *e.g.*, EX1004, ¶¶[0002], [0005], [0010], [0154] ("A property does its bookings through various channels…in order to maximize occupancy rate and

maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

To the extent it is argued further disclosure of storing, via a channel data structure, a channel record for ***each*** of a plurality of distribution channels is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Tamura.** Both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. And, as discussed, Jacob discloses an inventory management and distribution system that stores, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data" (*e.g.*, EX1004, ¶[0084]), and that its system comprises code segments to, *e.g.*, "communicate with other systems, such as sales systems (sales channels)," (*e.g.*, EX1004, ¶[0084]) including, *e.g.*, "web sites"/"Internet Merchant Website"/"internet web merchants"/a "hotel's own website." *E.g.*, EX1004, ¶¶[0084], [0007], [0077], [0085], Fig.7. Jacob further discloses that its system (*e.g.*, running the "RezTrip" application) is "configured to run on general purpose computers," that its system "comprises a computerized database" (*e.g.*, EX1004, ¶[0084]), that its system communicates, *inter alia*, "pricing and inventory information to the sales channels" (*e.g.*, EX1004, ¶[0185]), and that its system receives and processes information from the channels to make channel-specific determinations over time, *e.g.*, "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels" (*e.g.*, EX1004, ¶[00180], cls.1[h]-[i], 2). Tamura discloses "recording," on "merchandise distribution management server"/"sales management system" channel records, "the amount of inventory for each item of merchandise sold" by each of Tamura's retailers (*e.g.*, "Retailer A," "Retailer B") and other "merchandise distribution information." *E.g.*, EX1005, ¶¶[0014], [0017], Figs.2-3. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management and distribution system (in the recited combinations) using Tamura's beneficial teachings of storing, via a channel data structure, a channel record for *each* distribution channel.** This would have, *e.g.*, allowed

the resulting system to consistently and automatically store and accurately track, *e.g.*, inventory allocations, the number of reservations booked, the prices at which such reservations were booked, remaining inventory, and other data, as well as to efficiently and automatically communicate such data and receive data from Jacob's plurality of sales channels, thereby furthering Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" while minimizing the data entry required by, *e.g.*, hotel staff and "insur[ing] that each sales channel would always be working with the most up-to-date pricing, availability, and other information, EX1004, ¶¶[0002], [0005], [0010], [0154] ("A property does its bookings through various channels…in order to maximize occupancy rate and maximize room rate."), and Tamura's express goals of "reducing lost sales opportunities" and "eliminating a great deal of waste in the distribution process." *E.g.*, EX1005, ¶¶[0001], [0015]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

Alternatively, to the extent it is argued further disclosure of storing, via a channel data structure, a channel record for ***each*** of a plurality of distribution channels is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Kono.** Both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). And, as discussed, Jacob discloses an inventory management and distribution system that stores, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data" (*e.g.*, EX1004, ¶[0084]), and that its system comprises code segments to, *e.g.*, "communicate with other systems, such as sales systems (sales channels)," including, *e.g.*, "web sites"/"Internet Merchant Website"/"internet web merchants"/a "hotel's own website." *E.g.*, EX1004, ¶¶[0084], [0007], [0077], [0085], Fig.7. Jacob further discloses that its "RezTrip" system is "configured to run on general purpose computers," that its system "comprises a computerized database" (*e.g.*, EX1004, ¶[0084]), that its system communicates, *inter alia*, "pricing and inventory information to the sales channels" (*e.g.*, EX1004, ¶[0185]),

and that its system receives and processes information from the channels to make channel-specific determinations over time, *e.g.*, "[i]f a sales channel's Room Type inventory is sold out or is selling better than other channels" (*e.g.*, EX1004, ¶[00180], cls.1[h]-[i], 2). Kono discloses acquiring and storing "product sales information," and "product inventory information" and records for each agency comprising, *e.g.*, "agency sales information" and "agency inventory information" in an "agency information database" including an "agency sales (shipping) information database" and in a "form for performing an inventory analysis." *E.g.*, EX1007, ¶¶[0009], [0026], Figs.1-4. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management and distribution system (in the recited combinations) using Kono's beneficial teachings of storing, via a channel data structure, a channel record for *each* distribution channel.** This would have, *e.g.*, allowed the resulting system to consistently and automatically store and accurately track, *e.g.*, inventory allocations, the number of reservations booked, the prices at which such reservations were booked, remaining inventory, and other data, as well as to efficiently and automatically communicate such data and receive data from Jacob's plurality of sales channels, thereby furthering Jacob's express goals of goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels" while minimizing the data entry required by, *e.g.*, hotel staff and "insur[ing] that each sales channel would always be working with the most up-to-date pricing, availability, and other information, EX1004, ¶¶[0002], [0005], [0010], [0154] ("A property does its bookings through various channels…in order to maximize occupancy rate and maximize room rate."), and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" (Kono Summary) and reducing "unnecessary inventory on the market," EX1007, ¶¶[0011], [0015], [0017]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

1[c] receiving, from the vendor computing device through the channel interface, a selection, from the	**Jacob discloses receiving** (*e.g.*, receiving from "user interaction code segment")**, from the vendor computing device** (*see* cl.1[a]) **through the channel interface** (*see* cl.1[a])**, a selection** (*e.g.*, vendor's

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plurality of distribution channels, of one or more participant channels for a transportation service;	"[]allocat[ion]… to the… channel"[10]**), from the plurality of distribution channels** (*see* cl.1[b])**, of one or more participant channels for a transportation service** (*e.g.*, particular "sales channel"/"selling channel"/"Internet Merchant[]" (Fig.7)/"internet web merchant"/"User Website" (Fig.7) through which "reservation" is "made"; "sales channel" that is "selling"; *see* cl.1[b])**.** **Evangelist discloses receiving a selection, from a plurality of distribution channels, of one or more participant channels for inventory** (*e.g.*, "Controller" "allocat[es] a first portion of inventory for on-line fulfillment to a particular inventory location"/"allocate[s] inventory for… on-line… fulfillment" to, *e.g.*, "Web site that accepts requests for delivery of movies to customers," "store" or "on-line… channels"/"initially designate[s]" as "on-line inventory" of "store" or "on-line… channel"; "Controller… initially allocates inventory… to… stores"; "allocates inventory")**.**

[10] Jacob teaches allocating or "allott[ing]" inventory for various purposes, including, *e.g.*, to specific "Rate Types" and "Date Range[s]" (*e.g.*, EX1004, ¶[0189] ("Information comprising… inventory allotment… may be entered."), Fig.40 ("Change Allotment," "Allotment Date Range")), and also to different ***distribution channels*** (*e.g.*, EX1004, ¶[0180] ("reallocate inventory to the better-selling channel")). Jacob thus discloses or at minimum renders obvious selecting one or more participant channels for a transportation service. As discussed *infra* (following cl.1[c]), POSITA would have recognized Jacob's explicit disclosure of "**reallocat[ing]** inventory to the better-selling channel" as disclosing making changes to an *already-existing, original selection of one or more participant channels/allocation of inventory* among channels (or at minimum would have found such an original allocation was necessarily, and thus inherently, disclosed). *See, e.g.*, EX1004, Fig.7.

	"The system may be configured to communicate with the hotel staff, the hotel property management database, and a ***plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™,*** *telephone reservation systems,* ***a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems,*** *and tour operators*. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." EX1004, ¶[0007]. "In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations. ***The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations***." EX1004, ¶[0009]. "The system may further comprise a revenue management code segment. The revenue management code segment is used to analyze ***the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." EX1004, ¶[0010].

	"As used herein a GDS, or Global Distribution System, is a term used for major travel reservation systems (such as Apollo™, Sabre™, Worldspan™) which have a worldwide presence and were originally designed to provide reservations for the airline industry. Approximately 500,000 travel agents have access to these systems, which have been extended to allow bookings for the hotel/travel industry. [] As used herein End User, or EU refers to the users who come to a Property website, search for rooms, and optionally make a reservation. An EU may be a hotel customer or a travel agent using a GDS, a tour operator, a telephone reservation center worker, or other person using the system to make a reservation." EX1004, ¶[0063]. "***As used herein the Reservation Engine, Bookings Engine, and RezTrip™ Reservation Application refer to an application used by EU's to make reservations.*** One embodiment of the invention, RezTrip™, comprises a reservation engine for use by EUs, and an administrative application for use by hotel owners/employees." EX1004, ¶[0071]. "As used herein a Sales Channel or Selling Channel refers to a wholesale or retail selling channel. Sales channels may comprise GDS system, telephone reservations systems, tour operators, ***hotel web sites***, ***consolidator web sites such as Expedia™ or Travelocity™.***" EX1004, ¶[0077]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code***

	segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data. Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. ***Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts***

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	input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described." EX1004, ¶[0085]. "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The data relating to the Property are stored in the system database. The EA or SU then associates a PA with the property. The ***PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies***, and later by managing inventory and room rates. Once the ***PA has set up the Property within the system***, EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation. ***After an EU has made a reservation, confirmation***

information is sent to both the EU as well as the Property." EX1004, ¶[0086].

"***If a sales channel's Room Type inventory is sold out or is selling better than other channels***, the PA might choose to ***reallocate inventory to the better-selling channel***. Alternatively, the PA may choose to close the Rate Type/Room Type, for a given date or a series of dates, for certain channels." EX1004, ¶[0180].

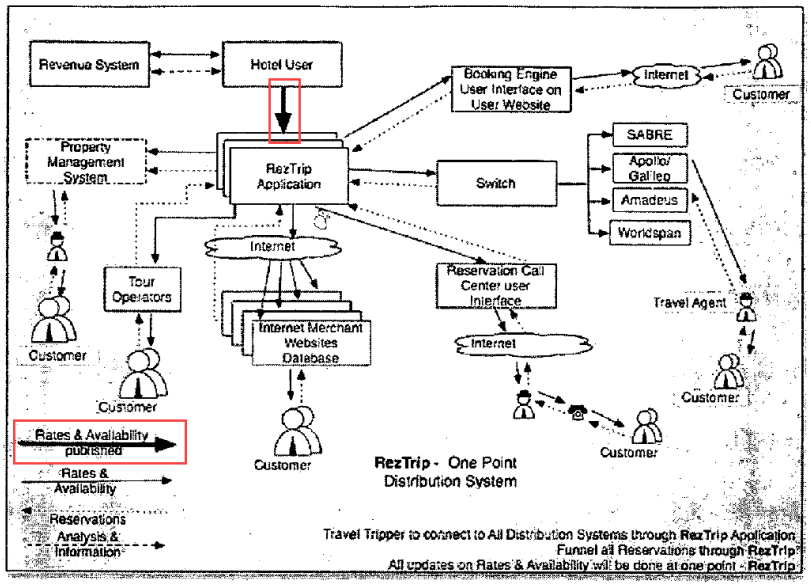


Figure 7

EX1004, Fig.7.

"Certain embodiments of the invention may provide one or more technical advantages. A technical advantage of one embodiment includes providing an efficient method of providing a customer with rented media. The system analyzes various criteria and selects an inventory location to fulfill a customer request. Inventory locations may include both fulfillment

	centers and stores, where the stores can ***allocate inventory for*** both ***on-line*** and in-store ***fulfillment***. Another technical advantage of an embodiment includes monitoring the activity of rentals and adjusting the inventory based on the rental activity. Adjusting the inventory to meet customer demand also promotes efficient operations and higher customer satisfaction." EX1010, 1:34-46. "For example, controller 100 may include a Web site that accepts requests for delivery of movies to customers 104." EX1010, 2:30-32. "Network 102 allows controller 100 to communicate with other networks, customers 104, fulfillments centers 106, and/or stores 108. Network 102 may include a public switched telephone network (PSTN), a local area network (LAN), a wide area network (WAN), any other public or private data network, a local, regional, or global communication network such as the Internet, an enterprise intranet, other suitable wireline or wireless communication link, or any combination of the preceding. Network 102 may include any combination of gateways, routers, hubs, switches, access points, base stations, and any other hardware and/or software that may implement any suitable protocol or communication." EX1010, 2:49-60. "Stores 108 each represent an entity, such as a person, a group of persons, and/or appropriate hardware and controlling logic, capable of fulfilling requests or invoices for media. In some embodiments, stores 108 may include technology capable of exchanging

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	information through network 102, for example, telephony equipment, computers, databases, a cable headend, satellite links, media players, or any other appropriate hardware and/or software. Furthermore, stores 108 may include traditional movie and game rental operations, such as viewable shelves of media inventory and point-of-sale equipment, which accommodate in-store media requests. Stores 108 include media inventory 110a-110c (generally referred to as inventory 110) that may be allocated based on the mode of fulfillment. For example, some of the media may be on-line inventory 110a designated for customers 104 who make on-line requests while other media may be in-store inventory 110b designated for customers 104 that make in-store requests. Also, visiting inventory 110c may represent media that belongs to another store 108 or fulfillment center 106." EX1010, 3:35-52. "Inventory information 212 indicates the availability of media at fulfillment centers 106 and stores 108. For example, inventory information 212 includes the identity and geographic locations of inventory locations (fulfillment centers 106 and stores 108) in system 10. Inventory information 212 maintains a count of different types of inventories 110 for each media title at each inventory location. Inventory information 212 may also include information regarding the store performance of stores 108, including a maximum number of on-line fulfillments allowed at store 108, accuracy and efficiency in meeting on-line requests, accounting information to credit revenue to store 108 for fulfilling on-line requests, and other similar information. Controller 100 updates inventory information 212 based on fulfilled requests, returned media, inventory updates and reconciliations, and other

	communications and activities in system 10. Thus, inventory information 212 may be based upon actual inventories. Alternatively or in addition, inventory information 212 may be based upon projections and forecasts of future inventories." EX1010, 5:20-38. "When initially designated, available media count 302a designated as on-line inventory 110a coincides with line 300, and available media count 306a designated as in-store inventory 110b coincides with line 304. Over time, customers 104 make media requests through on-line and in-store channels and the available media decreases. Available media count 302b represents the number of available on-line inventory 110a after a period of time, the available media decreases to zero at available media count 302c, and store 108 does not have any on-line inventory 110a of the media title. The media designated as in-store inventory 110b also decreases over time. Available media counts 306b-306e represent the decrease of in-store inventory 110b. For example, the maximum count of inventory 110 is available for a media title released on a Tuesday before customers 104 make requests. Available media count 302a represents the total available on-line inventory 110a and available media count 306a represents the total available in-store inventory 110b. As customers 104 begin making requests for the media title, the available media count decreases. By close of business on Thursday, on-line inventory 110a has decreased to available media count 302b and in-store inventory 110b has decreased to available media count 306b. By the end of Friday, on-line inventory 110a has an available media count 302c of zero and in-store inventory 110b decreases to available media count 306c. In-store inventory 110b continues to decrease on Saturday and Sunday, but an available media count

	306e remains at the time an evaluation occurs." EX1010, 6:59-7:17. "At point A, controller 100 determines the actual in-store rental activity of the media title. For example, the actual in-store activity may be determined after the media is available for a week, after the media is available for five days, or for any suitable period of time. The actual in-store rental activity is evaluated to determine whether inventories 110a and 110b should be reallocated. The evaluation includes comparing the maximum amount of available media and the actual in-store rental activity, considering expected demand that is not as high based on historical trends that show demand decreases some time after release of a media title, or any suitable evaluation. In the illustrated embodiment, available media count 306e indicates available in-store inventory 110b when the evaluation occurs, while on-line inventory 110a is zero. Because there is in-store inventory 110b 'left-on-shelf,' controller 100 determines to allocate more media to on-line inventory 110a. The total amount of available inventory 110 for distribution through both channels remains the same, but the particular allocation between in-store inventory 110b and on-line inventory 110a changes. After reallocation, on-line inventory 110a increases $?_1$, while in-store inventory 110b decreases by $?_1$." EX1010, 7:18-38. "Customers 104 continue to request media for distribution through on-line and in-store channels over time. The activity continues after point A and the available media decreases as customers 104 continue to make requests. The actual in-store rental activity of media distribution is reevaluated at point B. For

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	example, the reevaluation may occur a week after the initial evaluation, a month, or at any suitable time. Again, the evaluation may include comparing the amount of available media to the actual in-store rental activity, considering expected demand that is not as high based on historical trends that show demand decreases some time after release of a media title, or any suitable evaluation. At point B, in-store inventory 110b exceeds the demand for media through in-store requests, available media count 306h, while on-line inventory 110a does not meet the demand. In the illustrated embodiment, on-line inventory 110a and in-store inventory 110b is reallocated based on the comparison of projected activity and actual in-store rental activity. In-store inventory 110b decreases by Δ_2 and on-line inventory 110a increases by Δ_2. The reevaluation may continue additional times by comparing actual in-store rental activity to the projected activity. Reallocation of on-line inventory 110a and in-store inventory 110b may occur based on the reevaluations." EX1010, 7:39-60. "FIG. 4 is a flowchart 40 illustrating fulfilling a media request***. Controller 100 determines available inventory locations at step 400.*** Controller 100 considers fulfillment centers 106 and stores 108 based on geographical factors that may provide customer 104 the media in the shortest time. ***At step 402, controller 100 determines available inventory types in fulfillment centers 106 and stores 108. Controller 100 initially allocates inventory 110 to fulfillment centers 106 and stores 108 based on demographics, historical demands, or any suitable factor.*** Controller 100 further designates inventory 110 distributed to particular inventory locations. For example, controller 100 may determine that a particular store 108 receives fifty total

	copies of a media title, ten copies may be designated as on-line inventory 110a and forty copies may be designated as in-store inventory 110b. At step 404, controller 100 determines metrics of stores 108, such as the efficiency and accuracy of store 108. Controller 100 may consider other factors to select the inventory location in addition to the factors in steps 400-404. Furthermore, steps 400-404 may occur in parallel, sequentially, or in any suitable order." EX1010, 8:10-29. "FIG. 5 is a flowchart 50 illustrating the reallocation of media. Controller 100 may initially project on-line inventory 110a of a total available inventory 110 for on-line fulfillment and project in-store inventory 110b for in-store fulfillment. ***Based on this projection or using some other technique, controller 100 allocates inventory 110 at step 502.*** Controller 100 tracks the actual in-store rental activity at step 504. Tracking the actual in-store rental activity may occur over a specific period of time. For example, controller 100 may track the actual in-store rental activity over a week, compare the projections and actual activity, and then continue tracking the actual in-store rental activity. Controller 100 tracks the actual in-store rental activity for any configurable period of time." EX1010, 9:17-29. "A method performed on a computer for fulfilling a media request, comprising: allocating a first portion of inventory for on-line fulfillment to a particular inventory location; allocating a second portion of inventory for in-store fulfillment to the particular inventory location; determining in-store rental activity of the second portion of inventory, wherein determining in-store rental activity comprises:

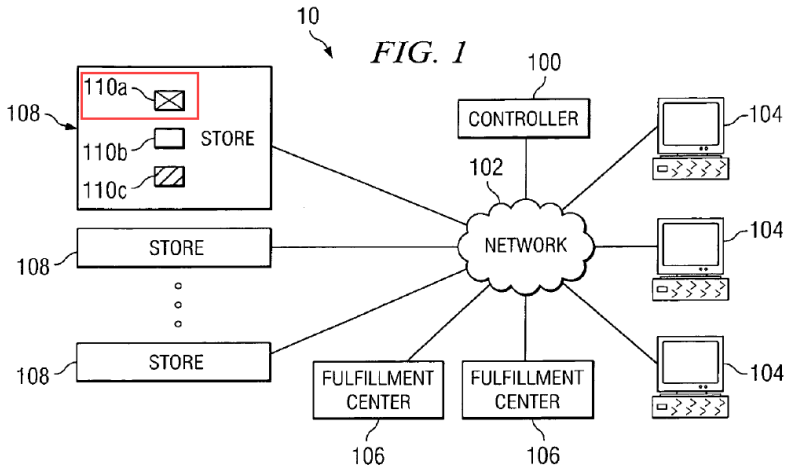
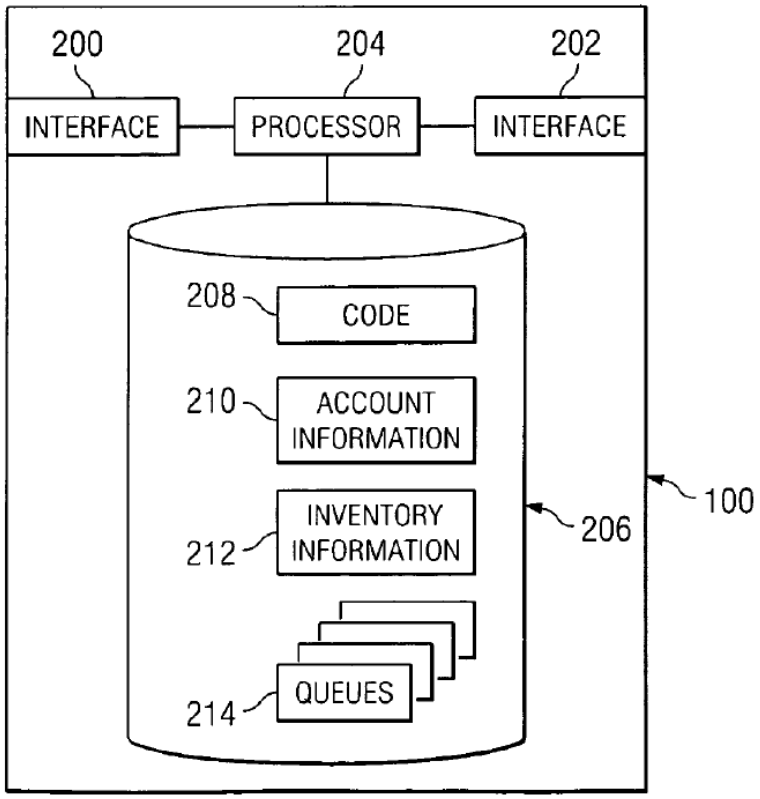
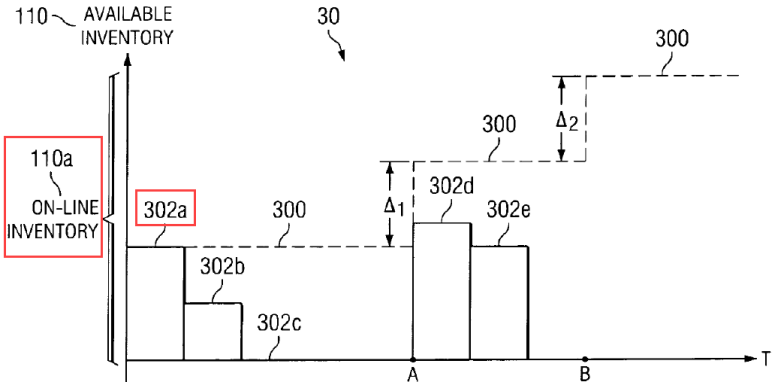
	determining a protected in-store rental activity of the second portion of inventory based on past in-store rental activity; determining an actual in-store rental activity of the second portion of inventory; and comparing the protected in-store rental activity and the actual in-store rental activity to determine whether to reallocate the first and second portions of inventory; reallocating the first and second portions of inventory in accordance with the determined in-store rental activity; receiving, at a computer, a media request associated with a subscriber account; and selecting, by the computer, one of a plurality of inventory locations to fulfill the media request, wherein at least one of the inventory locations accommodates in-store media rental requests." EX1010, cl.1. *see also* EX1010, cls.9-10, 18-19, 22-23.  EX1010, Fig.1.

FIG. 2

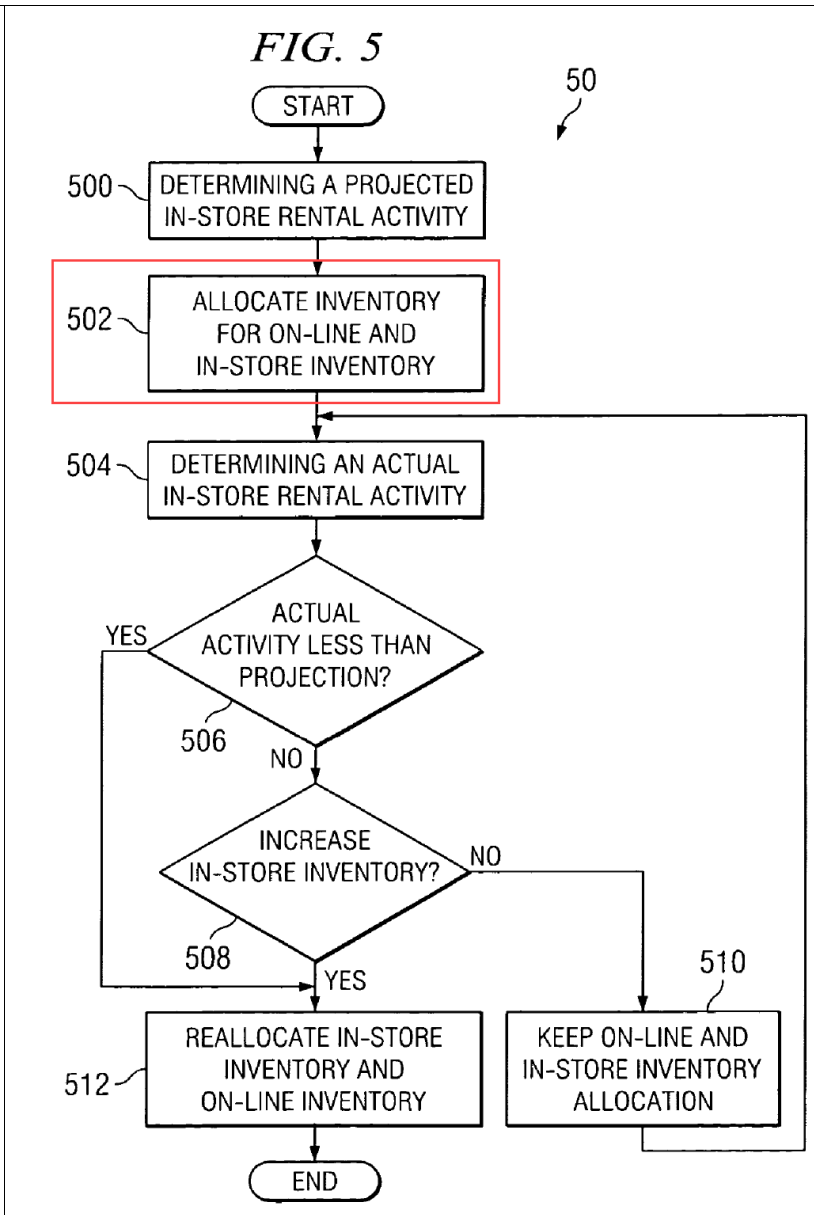


EX1010, Fig.2.

FIG. 3



EX1010, Fig.3.



EX1010, Fig.5.

Jacob expressly discloses that under various circumstances a property's "PA ["Property Administrator" (*e.g.*, EX1004, ¶[0066])] might choose to reallocate inventory to the better-selling channel" (*e.g.*, EX1004, ¶[0180]), and allocating/"allott[ing]" inventory for various purposes (*e.g.*, EX1004, ¶[0189] (specific "Rate Types," "Date Range[s]"), Fig.40), including to different ***distribution channels*** (*e.g.*, EX1004, ¶[0180]). **POSITA would have understood this to be an express disclosure that personnel associated with a Property**

(such as a hotel) in Jacob have—by communicating with the RezTrip computer/server through a vendor computing device (*see* cl.1[a])—previously performed an *allocation* of inventory (*i.e.*, a selection of one or more participant channels) to each distribution channel prior to "*re*allocat[ing]" such inventory and that such allocation was thus received from the vendor computing device.[11] *See, e.g.*, EX1004, ¶[0086] (describing that "The EA or SU… associates a PA with the property. The ***PA administers the property, initially by entering relevant Property information***…. Once the ***PA has set up the Property within the system***, EUs may connect to the reservation engine… and make a reservation"). The fact that a Property's personnel perform this allocating/selecting by connecting to the RezTrip computer/server from their vendor computing device is further confirmed by the fact that Jacob discloses the RezTrip computer/server *communicating*—to each channel—*information about* this allocation to each channel and about the inventory allocated. *See, e.g.*, EX1004, ¶¶[0154], [0086] ("Once the PA has set up the Property within the system, EUs may connect to the reservation engine [RezTrip computer/server], either directly or through intermediaries, select a room, and make a reservation. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property"), [0180]-[0181], [0185] ("Frequent updating and communication of pricing and inventory information to the sales channels"), [0191] ("Once the Rate Types, Room Types, and inventory have been managed… the pricing information, inventory information, and other information is communicated to the selling channels"), cls.5&6 ("code segment configured to communicate pricing information and inventory information to a plurality of [sales/selling] channels"), Fig.7 ("Rates and Availability" provided to each "Internet Merchant Website Database," "Booking Engine User Interface on User Website," etc., and then to each of their respective "Customer[s]" *for the inventory available from each such channel*). Alternatively, POSITA would at minimum have recognized that in order to "***reallocate*** inventory to the better-selling channel" Jacob necessarily, and thus inherently, allocates such inventory/selects a distribution channel prior to "reallocat[ing]." This must be the case, as without an initial "allocation" there could be no "reallocat[ing]." Further, POSITA would have recognized Jacob's disclosure of "**reallocat[ing]** inventory to the better-

[11] Similarly, Jacob also teaches defining "room constraints" for various purposes, including constraints as to specific "Rate Types" and "room types" (*e.g.*, EX1004, ¶¶[0008], [0162], Figs.5, 6).

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selling channel" as disclosing making changes to an *already-existing original allocation of inventory* among channels (or at minimum would have found such an original allocation was necessarily, and thus inherently, disclosed). To the extent, *arguendo*, further disclosure is required, **POSITA would at minimum have found it obvious, straightforward, and advantageous to implement Jacob's (in the recited combinations) disclosed "transportation services inventory" and "plurality of distribution channels" using Jacob's beneficial teachings of "reallocat[ing] inventory" such that Jacob's vendor computing device (*see* cl.1[a]) performs an allocation (*i.e.*, selection) of each item of Jacob's transportation services inventory to a distribution channel**. This would have, *e.g.*, beneficially allowed personnel associated with a Property (such as a hotel) in Jacob to make an initial allocation of inventory—by communicating with the RezTrip computer/server through a vendor computing device—to certain selected/preferred distribution channels, including to distribution channels that better suit the needs of the transportation services inventory provider or that are deemed to have a greater likelihood of selling inventory of a particular type or on a particular date at a higher price or in higher quantities than other distribution channels, thereby furthering Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels." EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.[12]

[12] As discussed (*e.g.*, in §V), and as is true for the other Grounds herein, as well, POSITA's REOS here is further confirmed by this technology's predictability, as confirmed by, *e.g.*, similar systems known to POSITA. *See, e.g.*, EX1026, 1-2 ("[t]he potential to reduce distribution costs using internet channels has made hotel managers more conscious of the need to ***maximize contributions to gross profit (revenue less distribution costs)*** rather than just the revenue obtained from a given room sale. In addition to ***considering rate and timing of sales***, hotel managers must evaluate the ***effects of distribution-channel management*** on their current revenue-management practices ["selling the right inventory to the right customer for the right price at the right time"] and determine how to benefit from it."), 3-4 ("A reasonable proposition is that ***it is most beneficial for hotels to book***

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To the extent it is argued further disclosure of allocating/selecting is required, **POSITA would have found it obvious based on Jacob (in the recited combinations) in view of Evangelist.** Jacob, Phillips, Tamura, Kono, and Evangelist describe inventory management systems that allocate inventory to distribution channels and that use sale data received from those channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0176], [0180]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"); EX1010, 1:34-46 ("technical advantage… includes providing an efficient method of providing a customer with rented media" and "[a]djusting the inventory to meet customer demands also promotes efficient operations and higher customer satisfaction"), ("controller 100 initially allocates inventory to… stores 108 based on demographics, historical demands, or any suitable factor"); EX1029, 9, 30, 33, 120-121, 134-135, 141. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed computer-implemented method of managing online bookings for transportation services inventory using Evangelist's beneficial teachings of initially allocating inventory to distribution channels.** Implementing Jacob's disclosed computer-implemented method of managing online bookings of transportation services inventory (in the recited combinations)—including with initial input/"set up" information received from the vendor computing device of an owner/administrator/personnel of a Property/Properties (*e.g.*, EX1004, ¶[0086])—using Evangelist's beneficial teachings of, *e.g.*, initially allocating inventory to such channels, including by using, *e.g.*, projections, demographics or historical demands to select such channels, would have beneficially increased the likelihood

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reservations through the least-expensive channels, if there is sufficient demand via those channels. To ***manage revenue by distribution channel***, revenue-management forecasting and optimization models must be revised to consider the relevant information"), 8 (""hotels with a small gap between room rates and a wide range of distribution costs are likely to attain a larger benefit from the extended method" of revenue forecasting for inventory allocation using "rate, length of stay, ***and distribution channel***").

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that the proper quantities and most relevant types of inventory are initially allocated to each sales channel, thereby increasing the ability of the system to fulfill Jacob's express goal of "maximiz[ing]… revenue" by better accounting for marketplace dynamics. For POSITA (including from the express disclosures of Jacob, Evangelist, and Phillips, discussed above, and other similar systems known to POSITA) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1026, 2 ("Since the hotel industry adopted revenue management in the 1980s, it has been developed and practiced by different hotel companies at varying levels of sophistication. Some hotels use daily occupancy forecasts to determine rate availability, while others develop multiple arrival forecasts for combination of rate, length of stay, and room type, and optimize the inventory allocation at every 15th booking."; "Allocation decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions"), 3 ("Detailed forecasts by rate category and length of stay have been shown to reduce forecast error").

1[d] establishing, via the channel data structure, one or more active channel records based upon the one or more participant channels for the transportation service;	**Jacob discloses establishing** (*e.g.*, designating)**, via the channel data structure** (*e.g.*, cl.1[b])**, one or more active channel records** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries showing "sales channel" is active (*e.g.*, via "sales channel data," "inventory data," "other data" reflecting, *e.g.*, channel is allocated inventory (*see* cl.1[c])/actively selling) **based upon the one or more participant channels for the transportation service** (*see* cl.1[c])**.** **Tamura discloses establishing** (*e.g.*, designating)**, via the channel data structure** (*e.g.*, cl.1[b])**, one or more active channel records** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries showing "retailer" is selling) **based upon one or more participant channels** (*e.g.*, particular "retailer" (*e.g.*, "Retailer A" (Fig.3),

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	"Retailer B" (Fig.3)) by which "item of merchandise" is "sold") (*see* Fig.3)**.** **Kono discloses establishing** (*e.g.*, designating)**, via the channel data structure** (*e.g.*, cl.1[b])**, one or more active channel records** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries (*e.g.*, "contents of…form") showing "agency" is selling) **based upon one or more participant channels** (*e.g.*, agency (*e.g.*, "aaaa," (Fig.4) "bbbb," "Company A," (Fig.1) "Company B," (Fig.1) "Company C" (Fig.1)) at which "order" or "orders" are placed; agency with more than "0" "Inventory Count," "Order Backlog" and "Shipping Volume") (*see* Fig.4)**.** "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. ***The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" EX1004, ¶[0006].

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	"As used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which manage data do so through their associated functions." EX1004, ¶[0078]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels. The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random

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	access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." Jacob¶[0082]. "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." EX1004, ¶[0083].

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	"***Embodiments of the invention comprise a computerized database such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The database is configured to manage hotel data*** comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, ***inventory data***, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, ***sales channel data***, communications data, and other data. In addition, embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." EX1004, ¶[0084]. "The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100)***; a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items

	purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110).” EX1005, ¶[0014]. “Fig. 1 is a block diagram of the overall configuration of a sales management system illustrating a first embodiment of the invention. ***In the figure, the sales management system 20 is connected to a merchandise distribution management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period. For example, the server receives sales information from POS terminals at the retail stores***, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise distribution management server 10 is also transmitted to the manufacturers’ production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer’s side, sales department personnel use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as

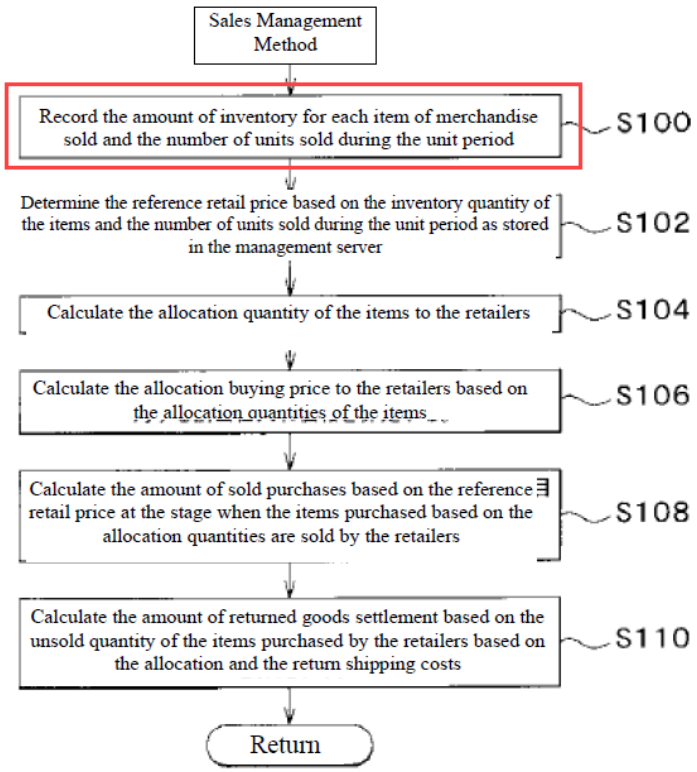
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	to evaluate the selling capabilities of each retailer." EX1005, ¶[0017]. "Following is a description of the flow of merchandising transactions in the sales management system thus configured. Fig. 2 is a flowchart describing the sales management method. ***First, the inventory quantity for each item of the sold merchandise and the number of units sold during the unit period are stored in the merchandise distribution management server 10 (S100), as well as the retailer identification information of the sold merchandise. Additionally, the merchandise distribution management server 10 also stores information related to each item of sold merchandise, such as the item number, allocated buying price, reference retail price, sold purchase amount, and returned goods settlement amount.*** Such information related to each item of merchandise sold may be identified and managed, for example, by means of tags attached to the merchandise sold." EX1005, ¶[0024]. "Next, the time-of-sale purchase-price calculation unit 28 calculates the sold purchase price, based on the reference retail price, at the stage when the item purchased based on the allocation quantity is sold at each retail store (S108). Each time the item is sold, at each retail store, ***sales information is transmitted from the POS terminal to the sales management system 20 and the merchandise distribution management server 10***." EX1005, ¶[0026]. "A sales management method for executing each step using a computer: ***recording the inventory and the***

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number of units sold during the unit period for each item of merchandise for sale; determining the reference retail price based on the inventory and the number of units sold during the unit period of the item as stored in the management server; calculating the allocated quantity of the items for each retailer; calculating the allocated stocking price of the items for each retailer based on the allocated quantity of the items; calculating stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and calculating the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity." EX1005, cl.5.

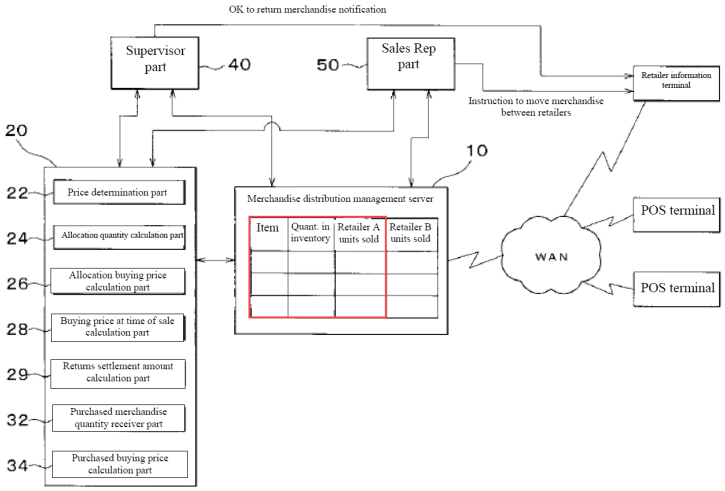
Fig. 2



EX1005, Fig.2.

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Fig. 3



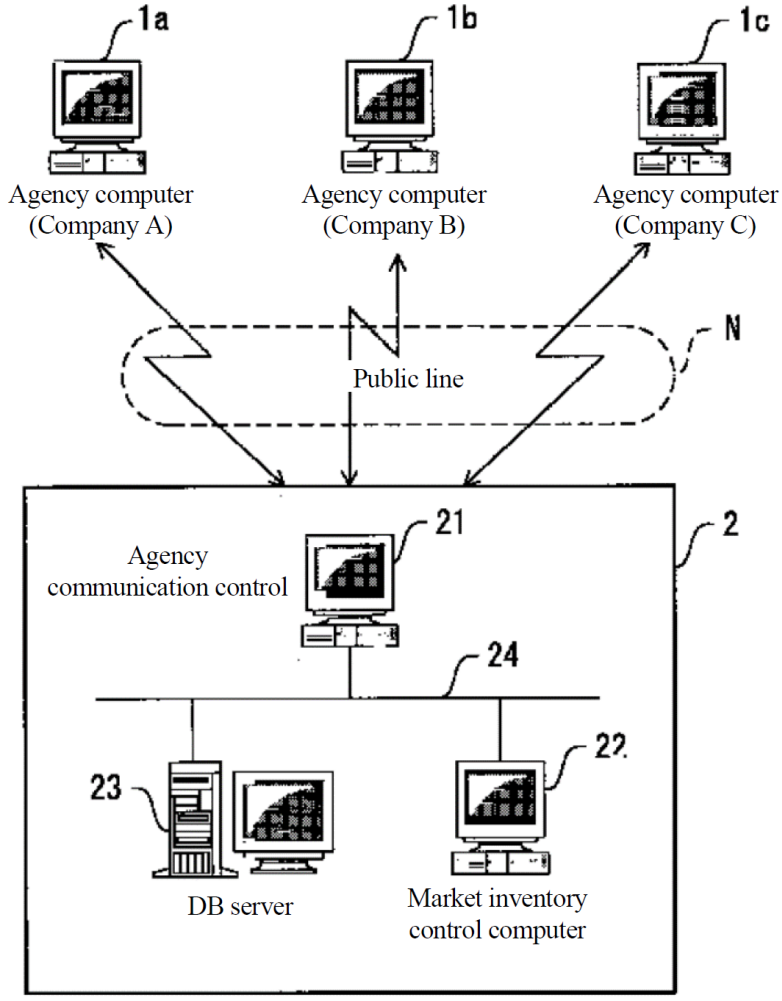
EX1005, Fig.3.

"A maker-side server device, the maker being a manufacturer, ***acquires product shipment information from an agency to a retail store and product inventory information of the agency from each agency*** (steps S1, S2), calculates a predicted sales volume for the next month based on the acquired product shipment information and product inventory information of each agency (step S3), and determines whether to produce or stop production on the basis of the calculated predicted sales volume for the next month (steps S4, S5) and the like. When, as a result, production is stopped, for the product whose sales on the market have fallen, inventory adjustment is performed on the market by instructing resale of the inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instructing transfer between warehouses (step S7)." EX1007, Summary.

	"FIG. 2 illustrates an example of various databases controlled by the database server 23. Three kinds of databases controlled by the database server 23 are prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the agency sales information database 23b. Moreover, ***monthly sales indexes of the previous year and current year are saved in the sales index database 23c***. In the database server 23, these data are updated daily so that ***the data can be stored and analyzed***. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software." EX1007, ¶[0026]. "***The maker-side server device 2 checks the sales of each agency by referring to the contents of this form***. In the example illustrated in FIG. 4, at the agency "ffff" the shipping volume for the last month is 250, and the backlog of orders is 250, while the remaining inventory is more than enough at 2,500. Since the production of product "AAAAAAA" has been stopped and a new substitute product is already scheduled to be introduced to the market, the product "AAAAAAA" will not be sold in the future. In this case, conventionally, products that are no longer necessary at the agency will be returned from the commercial practice of daily necessities, and the maker must pay the agency for the price of the return. On the other hand, at the agency "bbbb," the inventory count is 336, and the backlog of orders remaining is 2,390, and movement of products is

still active, and products are presently still out of stock." EX1007, ¶[0043].

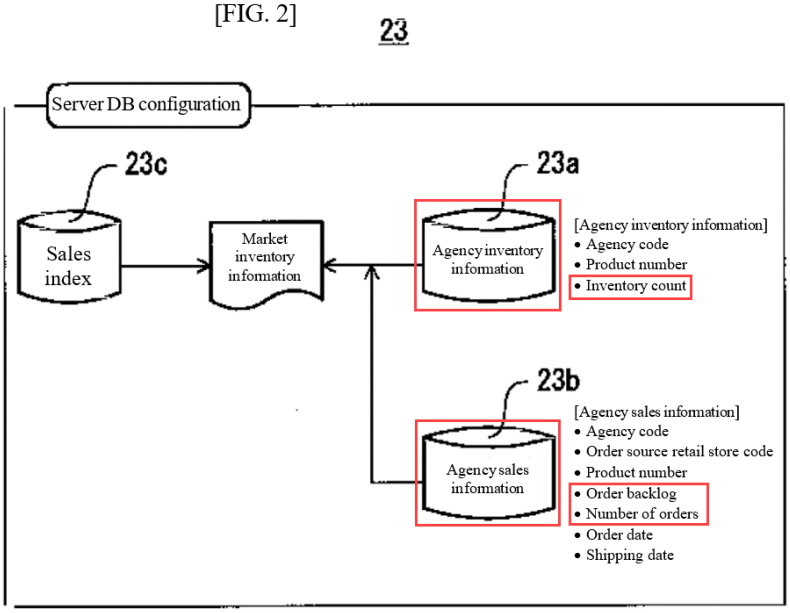
[FIG. 1]



EX1007, Fig.1.

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[FIG. 2]



EX1007, Fig.2.

[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

EX1007, Fig.4.

Jacob expressly discloses or at minimum renders obvious storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*, EX1004, ¶[0084]) via a channel data structure (*see* cl.1[b]). As discussed, Jacob (in the recited combinations) also expressly discloses allocating inventory to each sales channel (*see* cl.1[c]) and closing Rate Types/Room Types for certain channels (*e.g.*, EX1004, ¶[0180]). Based on these disclosures, **POSITA would have further understood the system of Jacob (in the recited combinations)**

differentiates between channels that are allocated inventory and are selling (*i.e.*, participant channels) and those that are not, and does so by designating, via data stored in the channel data structure (*i.e.*, record for a channel comprising, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data") a record of such participant channels (*e.g.*, record contains data indicating channel is active—allocated inventory/selling). At minimum, **POSITA would have understood that Jacob necessarily, and thus inherently does so in order to allow Jacob's system to differentiate between channels that are selling (and thus, *e.g.*, should be considered for purposes of determining whether another channel is, *e.g.*, "selling better") and those that are not**. To the extent it is argued further disclosure is required, **POSITA at minimum would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed channel data structure and storage of "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data" using Jacob's beneficial teachings of allocating inventory to/selecting particular sales channels such that Jacob's system (in the recited combinations) establishes via the channel data structure one or more active channel records based upon the one or more participant channels for the transportation service.** This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should additional sales channels become necessary (*e.g.*, if participant channels are not selling well). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels." EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

To the extent it is argued further disclosure of establishing one or more active channel records based upon one or more participant channels, **this would have been obvious based on Jacob (in the recited combinations) in view of Tamura.** As discussed, both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more

efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. And, as discussed, Jacob expressly discloses storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*, EX1004, ¶[0084]) via a channel data structure (*see* cl.1[b]). Tamura discloses storing a channel record (*see* cl.1[b]) establishing that a particular "retailer" (*e.g.*, "Retailer A"; "Retailer B") is selling ("item of merchandise" is "sold"). *E.g.*, EX1005, ¶¶[0017], [0024], Fig.3. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management and distribution system (in the recited combinations), including its disclosures of storing "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data" using Tamura's beneficial teachings of establishing one or more active channel records based upon one or more participant channels.** This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should additional sales channels become necessary (*e.g.*, if participant channels are not selling well). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels," (*e.g.*, EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Tamura's express goals of "reducing lost sales opportunities" and "eliminating a great deal of waste in the distribution process." *E.g.*, EX1005, ¶¶[0001], [0015]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See*, *e.g.*, EX1029, 31 (discussing, *e.g.*, "a 'pricing matrix' database [that] specifies which prices are available to which customers through which channels").

Alternatively, to the extent it is argued further disclosure of establishing one or more active channel records based upon one or more participant channels, **this would have been obvious based on Jacob (in the recited combinations) in view of Kono.** As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more

efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). And, as discussed, Jacob expressly discloses storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*, EX1004, ¶[0084]) via a channel data structure (*see* cl.1[b]). Kono discloses designating entry/entries (*e.g.*, "contents of… form") showing that a particular "agency" is selling (*e.g.*, agency "aaaa" or "Company A" at which "order" or "orders" are "placed"). *E.g.*, EX1007, ¶[0043], Fig.4. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management and distribution system (in the recited combinations), including its disclosures of storing "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data" using Kono's beneficial teachings of establishing one or more active channel records based upon one or more participant channels.** This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should additional sales channels become necessary (*e.g.*, if participant channels are not selling well). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels," (*e.g.*, EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" (*e.g.*, EX1007, Summary) and reducing "unnecessary inventory on the market," *e.g.*, EX1007, ¶¶[0011], [0015], [0017]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See*, *e.g.*, EX1029, 31 (discussing, *e.g.*, "a 'pricing matrix' database [that] specifies which prices are available to which customers through which channels").

1[e] establishing, via the channel data	**Jacob discloses establishing** (*see* cl.1[d])**, via the channel data structure** (*see* cl.1[b])**, one or more**

structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service;	**inactive channel records based upon one or more non-participant channels for the transportation service** (*e.g.*, channel record (*see* cl.1[b]) with entry/entries showing "sales channel" is inactive (*e.g.*, via "sales channel data," "inventory data," "other data" reflecting, *e.g.*, channel is not allocated inventory (*see* cl.1[c])/not actively selling), "Rate Type/Room Type" "close[d]" "for certain channels")) (*see* cl.1[c], [d])**.** **Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive** (*e.g.*, "Some products may not be offered through some channels"; "Southwest Airlines and JetBlue… do not accept bookings through any… GDS" other than "SABRE")**.** "The system may be configured to communicate with the hotel staff, the hotel property management database, and a ***plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™,*** *telephone reservation systems,* ***a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems,*** *and tour operators*. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." EX1004, ¶[0007].

	"As used herein a GDS, or Global Distribution System, is a term used for major travel reservation systems (such as Apollo™, Sabre™, Worldspan™) which have a worldwide presence and were originally designed to provide reservations for the airline industry. Approximately 500,000 travel agents have access to these systems, which have been extended to allow bookings for the hotel/travel industry. [] As used herein End User, or EU refers to the users who come to a Property website, search for rooms, and optionally make a reservation. An EU may be a hotel customer or a travel agent using a GDS, a tour operator, a telephone reservation center worker, or other person using the system to make a reservation." EX1004, ¶[0063]. "As used herein a Sales Channel or Selling Channel refers to a wholesale or retail selling channel. Sales channels may comprise GDS system, telephone reservations systems, tour operators, ***hotel web sites***, ***consolidator web sites such as Expedia™ or Travelocity™.***" EX1004, ¶[0077]. "***Embodiments of the invention comprise a computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. ***The database is configured to manage hotel data comprising*** portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, ***inventory data***, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, ***sales channel data***, communications data, and other data. In addition, embodiments of the invention comprise code

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	segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PA's), and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." EX1004, ¶[0084]. "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described." EX1004, ¶[0085]. "***A Property does its bookings through various channels, and it associates inventory with various Rate Types*** in order to maximize occupancy rate and maximize room rate for each Room Type." EX1004, ¶[0154]. "If a sales channel's Room Type inventory is sold out or is selling better than other channels, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, ***the PA may choose to close the Rate Type/Room Type, for a given date or a series of dates, for certain channels***." EX1004, ¶[0180].

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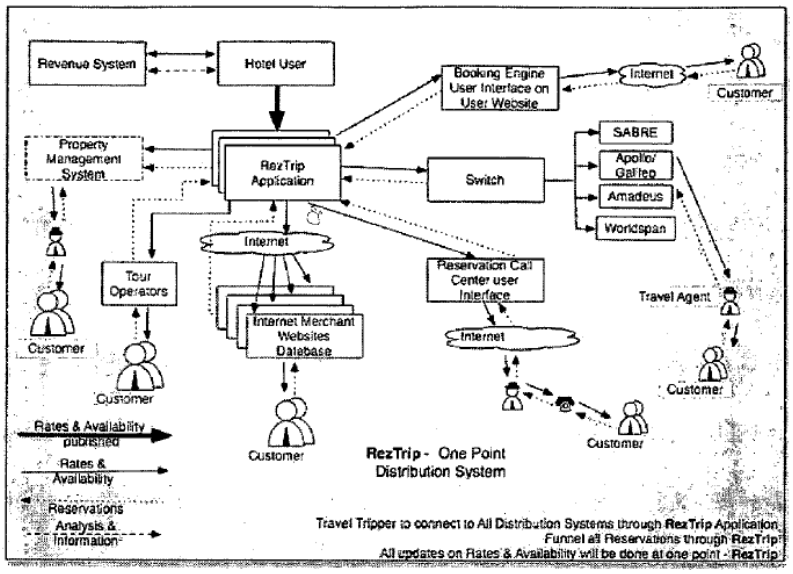


Figure 7

EX1004, Fig.7

"**The goal of pricing and revenue optimization is to provide the right price,**

- for every product
- to every customer segment
- **through every channel**

and to update those prices over time in response to changing market conditions. The three dimensions of pricing and revenue optimization can be illustrated in a cube, as shown in Figure 2.4. Each element within the cube represents a combination of product, channel, and customer segment. Each element (or *cell*) has an associated price. For example, one element might be:

> *medium-size turbines sold to large customers in the northeast via the direct sales channel*

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	Another element might be: *Replacement gears sold to small companies via online sales* In theory, each cell within the PRO cube could correspond to a different price. In practice, some cells may not be meaningful. **Some products may not be offered through some channels,** for example." EX1029, 26 (italics in this quote original). "Global distribution systems provide a conduit connecting the reservation system and a number of important sales outlets-particularly travel agents. There are currently over 180,000 GDS terminals worldwide. Most of these terminals are placed with travel agents, but some are in the travel offices oflarge companies (Marvel 2004). The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan…. Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines. Most airlines, major hotel chains, major rental car companies, and cruise lines have contracts with most or all of the global distribution systems allowing them to distribute and sell their products. There are exceptions: ***Both Southwest Airlines and JetBlue Airways subscribe only to SABRE and do not accept bookings through any other GDS*** (Kontzer 2004)." EX1029, 126. "In fact, ***it is not uncommon for individual sellers to be utilizing different approaches for different products through different channels***. For example, an automobile manufacturer is likely to sell the majority of vehicles through dealers, utilizing a combination of

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	"shelf price" (in this case, the wholesale price) and promotions. However, Ford Motor Company receives about 9% of its revenue in North America from group sales of cars to corporate, government, and industrial fleets. These sales are generally priced through individual negotiations or bids. Finally, ***a manufacturer may also be selling <u>some</u> cars directly to the public through a deal with an online channel***. In this case, the manufacturer needs to apply pricing and revenue optimization across the entire range of its channels and pricing mechanisms in order to maximize total profitability." EX1029, 29. "The range of costs shown in Figure 6.4 represents a channel-pricing opportunity. It also provides an expanded opportunity for revenue management—***airlines and hotels can establish fare classes based on the channel of a booking request and determine whether or not to provide availability through that channel.*** Furthermore, it provides a tremendous economic incentive for revenue management companies to steer demand as much as possible through lower-cost channels. While online travel has been booming, the global distribution systems still account for about 60% of bookings for a typical airline and about 68% for a typical hotel, leaving plenty of scope for future savings (Grossman 2004)." EX1029, 137-38. "Special ***"Web-only" fares for airline tickets are available through the Internet but not through travel agencies***." EX1029, 79.

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	"For an airline or hotel, prices are updated by opening or closing fare classes—a process discussed in more detail in Chapter 6. In other cases, ***a "pricing matrix" database specifies which prices are available to which customers through which channels***." EX1029, 31.

As discussed, Jacob expressly discloses or at minimum renders obvious storing "hotel data," including, *e.g.*, "sales channel data" and "inventory data" (*e.g.*, EX1004, ¶[0084]) via a channel data structure (*see* cl.1[b], 1[d]). As discussed, Jacob (in the recited combinations) also expressly discloses or at minimum renders obvious allocating inventory to each sales channel (*see* cl.1[c]) and closing Rate Types/Room Types for certain channels (*e.g.*, EX1004, ¶[0180]). Jacob further discloses not selecting (or de-selecting) certain channels—*e.g.*, that "[a] Property does its bookings through ***various*** channels, and it associates inventory with various Rate Types in order to maximize occupancy rate and maximize room rate for each Room Type," but ***"for certain channels" a "Rate Type/Room Type" may be "close[d]"*** (EX1004, ¶¶[0154], [0180]). Based on these disclosures, **POSITA would have further understood the system of Jacob (in the recited combinations) differentiates between channels that are not allocated inventory and are *not* selling (*i.e.*, non-participant channels) and those that *are*, and does so by designating, via data stored in the channel data structure (*i.e.*, record for a channel comprising, *e.g.*, "inventory data," "availability data," "audit trail data," "sales channel data," "communications data," and "other data") a record of such non-participant channels (*e.g.*, record contains data indicating channel is inactive—not allocated inventory/not selling).** At minimum, POSITA would have understood that **Jacob necessarily, and thus inherently does so in order to allow Jacob's system to differentiate between channels that are selling (and thus, *e.g.*, should be considered for purposes of determining whether another channel is, *e.g.*, "selling better") and those that are not.**

To the extent it is argued further disclosure is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Phillips.** As discussed, both Jacob and Phillips describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004,

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¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1029, 9, 30, 33, 121-122, 134-135, 141. In addition to Jacob's teachings, Phillips expressly discloses the existence of non-participant channels that are known to be inactive, teaching that, *e.g.*, ***"[s]ome products may not be offered through some channels,"*** and, *e.g.*, "***Southwest Airlines and JetBlue***… subscribe ***only*** to ***SABRE*** and ***do not accept bookings through any other GDS***." *E.g.*, EX1029, 26, 126, 29 ("a manufacturer may also be ***selling some cars*** directly to the public ***through a deal with an online channel***"), *see also* EX029, 31 ("a 'pricing matrix' database specifies ***which prices are available to which customers through which channels***"), 79 ("Special "Web-only" ***fares*** for airline tickets are ***available through the Internet but not through travel agencies***."), 137-38 ("airlines and hotels can establish fare classes based on the channel of a booking request and determine ***whether or not to provide availability through that channel***."; noting there is "***tremendous economic incentive for revenue management companies to steer demand as much as possible through lower-cost channels***."). At minimum, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's system (in the recited combinations), including its disclosures of storage of "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data," using Jacob's and Phillips's beneficial teachings of not selecting/de-selecting certain channels (discussed *supra*) to participate/from participating in selling Jacob's transportation services inventory such that the system (in the recited combinations) establishes, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service,** including by establishing a record of non-participant channels with data reflecting that they are inactive. This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should a price adjustment or additional sales channels become necessary (*e.g.*, if existing participant channels are not selling well or if they have a lower expected net contribution to revenue). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing]

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advantage of many different sales channels," (*e.g.*, EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Phillips's express goal of, *e.g.*, "maximizing *expected net contribution*," which is "price (fare) minus incremental cost," consistent with Phillips's teaching that there is "tremendous economic incentive… to steer demand as much as possible through lower-cost channels." EX1029, 136-38 (emphasis original). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

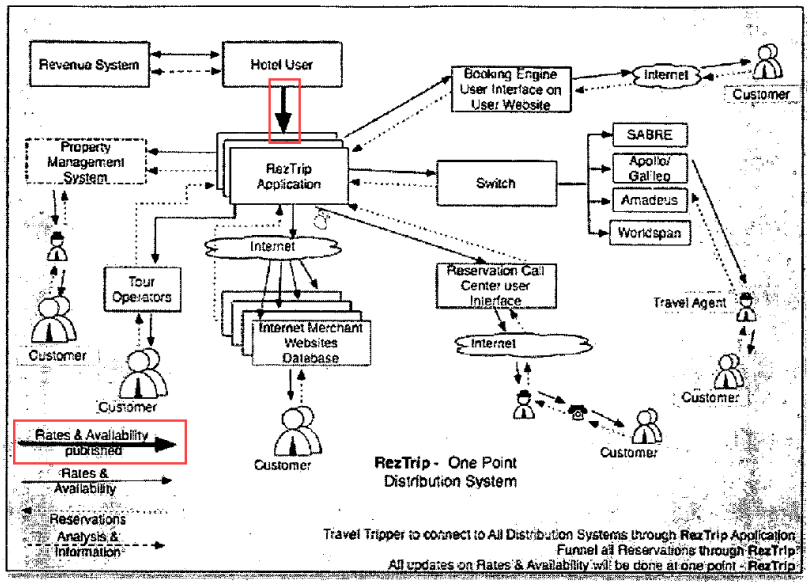
1[f] linking the one or more active channel records to the channel interface;	**Jacob discloses linking the one or more active channel records** (*e.g.*, cl.1[d]) **to the channel interface** (*see* cl.1[a]) (*e.g.*, making the records available via the interface (including, *e.g.*, using "code segments configured to interact with the [system's] database" that allow the RezTrip computer/server to access the "system database" storing the records), such that, "[o]nce the PA has set up the Property within the system, EUs may connect to the reservation engine [RezTrip],… select a room, and make a reservation.") (*see* cl.1[a])**.** **Kono discloses linking the one or more active channel records** (*e.g.*, cl.1[d]) **to the channel interface** (*see* cl.1[a]) (*e.g.*, making the records available via the interface) (*see* cl.1[a])**.** "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a***

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	code segment configured to manage hotel data, and other time-dependent inventory data. Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. ***Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web***

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	browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "Embodiments of the invention comprise a ***computerized database*** such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases. The ***database is configured to manage hotel data*** comprising portal data, property data, room type data, rate type data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, ***embodiments of the invention comprise code segments configured to interact with the database, to interact with users (EU's, SU's, EA's, and PAs), and to communicate with other systems, such as sales systems (sales channels) of vendors***. Communications may be encrypted or unencrypted and may take place on wired or wireless networks." EX1004, ¶[0084]. "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. As shown in FIG. 7, ***the RezTrip™ system communicates with the hotel user***, the hotel property management system, tour operators, ***internet web merchants***, reservation call centers, GDS systems, and the hotel's own website. It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not

	intended to limit the invention to the specific embodiment described." EX1004, ¶[0085]. "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The ***data relating to the Property are stored in the system database***. The EA or SU then associates a PA with the property. The PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies, and later by managing inventory and room rates. ***Once the PA has set up the Property within the system, EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation***. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property." EX1004, ¶[0086].  Figure 7

	EX1004, Fig.7. "***The maker-side server device 2 checks the sales of each agency by referring to the contents of this form***. In the example illustrated in FIG. 4, at the agency "ffff" the shipping volume for the last month is 250, and the backlog of orders is 250, while the remaining inventory is more than enough at 2,500. Since the production of product "AAAAAAA" has been stopped and a new substitute product is already scheduled to be introduced to the market, the product "AAAAAAA" will not be sold in the future. In this case, conventionally, products that are no longer necessary at the agency will be returned from the commercial practice of daily necessities, and the maker must pay the agency for the price of the return. On the other hand, at the agency "bbbb," the inventory count is 336, and the backlog of orders remaining is 2,390, and movement of products is still active, and products are presently still out of stock." EX1007, ¶[0043]. "This system is configured such that agency terminals 1a, 1b, 1c, ... installed at each agency having transactions and a server device 2 of the manufacturer (maker side) are connected via a network (public line) N. However, the agency terminals 1a, 1b, 1c, ... and the manufacturer server device (hereinafter referred to as the maker-side server device) 2 may be connected by a communication network such as the Internet." EX1007, ¶[0024]. "Moreover, ***the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in***

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	the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like. Moreover, the market inventory control computer 22 is provided with: ***acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency*** from each agency terminal 1a, 1b, 1c, ...; analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency; and transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, ***instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instructing transfer between warehouses." EX1007, ¶[0025]. [FIG. 4] Good Class. / Product No. / Product Name / Agency Name / Inventory Count / Order Backlog / Shipping Volume / Inventory Date KC0742 / AAAAAA / Sorting pedal bin #40 / aaaa / 100 / 0 / 3 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / bbbb / 336 / 2390 / 2351 / 8/21/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / cccc / 560 / 20 / 15 / 8/21/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / dddd / 365 / 1200 / 1350 / 8/21/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / eeee / 10 / 10 / 10 / 8/21/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / ffff / 2500 / 250 / 250 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / gggg / 0 / 0 / 0 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / hhhh / 0 / 0 / 0 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / iiii / 0 / 0 / 0 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / jjjj / 0 / 0 / 0 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / kkkk / 0 / 0 / 0 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / llll / 9 / 5 / 10 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / mmmm / 45 / 5 / 5 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / nnnn / 0 / 0 / 0 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / oooo / 9 / 3 / 20 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / pppp / 5 / 0 / 0 / 8/22/2000 KC0742 / AAAAAA / Sorting pedal bin #40 / qqqq / 96 / 20 / 85 / 8/22/2000 EX1007, Fig.4

As shown in cls.1[a]-[c], Jacob (in the recited combinations) discloses or at minimum renders obvious a channel interface, through which, *e.g.*, Property personnel may, *inter alia*, "set up" and later modify the allocation, price, and other attributes of Jacob's time-dependent inventory—and that, after being, *e.g.*, received from the "PA" (Property Administrator), the "data relating to the Property are stored in the system database"—including in channel records for each channel, *see* cl.1[b]. Jacob additionally explains that, "[o]nce the PA has set up the Property

within the system, [end users] may connect to the reservation engine [RezTrip], [including] through intermediaries, select a room, and make a reservation." *E.g.*, EX1004, ¶¶[0086], [0066], [0113]-[0115] [0176], [0180], Figs.20-47. Jacob further discloses that its software includes "code segments configured to interact with the database," which, *inter alia*, stores "sales channel data," "inventory data," and "other data" (*e.g.*, EX1004, ¶¶[0082]-[0084]), as well as a "code segment configured to communicate pricing information and inventory information to a plurality of sales channels" (*e.g.*, EX1004, cl.5), serving the goal that "each sales channel would always be working with the most up-to-date pricing, availability, and other information." *E.g.*, EX1004, ¶[0005]. **POSITA would have understood from these disclosures that Jacob expressly discloses making available the one or more stored active channel records (*see* cl.1[b]) to the channel interface to permit Property personnel using the vendor computing device to exchange data with the RezTrip computer/server (and the database it accesses, facilitated by "code segments configured to interact with the [system's] database") through the channel interface, to perform both initial setup of, and later modification to, such records, which are used by the RezTrip computer/server in its interactions with the channels.** At minimum, **POSITA would have understood that Jacob (in the recited combinations) necessarily, and thus inherently, discloses that these records are made available via the channel interface in order to enable Jacob's above-discussed setup and modification of, and access to, the active channel records.** Alternatively, to the extent it is argued further disclosure is required, at minimum **POSITA would have found it obvious, straightforward, and advantageous to implement the combined system's disclosed database and code segments, and initial setup/later modification to attributes of Jacob's time-dependent inventory (in the recited combinations) such that the system's one or more active channel records are made available to the channel interface.** This would have, *e.g.*, beneficially allowed the system and its users to use and modify the active channel records using Jacob's (or the combined system's) disclosed computer hardware and software to, *e.g.*, set and update pricing information and/or inventory allocations in response to changing market conditions, and enabled the use (and communication to, *e.g.*, the channels) of the data these records contain. This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels." *E.g.*, EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to

maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *E.g.*, EX1029, 31 (discussing, *e.g.*, "a 'pricing matrix' database [that] specifies which prices are available to which customers through which channels"), 134 ("revenue management system includes a database with information on current bookings on all flights. It also includes a database incorporating fares for all product/fare class combinations, capacities on all flight legs, and passenger variable costs by product.").

To the extent it is argued further disclosure is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Kono.** As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). And, as discussed, Jacob expressly discloses a channel interface , through which, *e.g.*, Property personnel may, *inter alia*, "set up" and modify the allocation, price, and other attributes of Jacob's time-dependent inventory—and that, after being, *e.g.*, received from the Property Administrator, the "data relating to the Property are stored in the system database"—including in channel records for each channel, *see* cl.1[b]. Jacob explains: "Once the PA has set up the Property within the system, [end users] may connect to the reservation engine [RezTrip], [including] through intermediaries, select a room, and make a reservation." *E.g.*, EX1004, ¶¶[0086], [0066], [0113]-[0115] [0176], [0180], Figs.20-47. And Jacob discloses that its software includes "code segments configured to interact with the database," which, *inter alia*, stores the pertinent data (*e.g.*, EX1004, ¶¶[0082]-[0084]), as well as a "code segment configured to communicate pricing information and inventory information to a plurality of sales channels." *E.g.*, EX1004, cl.5, ¶[0005]. Kono further discloses storing and updating, using received sale data, the "contents of" Kono's "form," which include "Agency Name," "Inventory Count," "Order Backlog," and "Shipping Volume." *E.g.*, EX1007, ¶[0043], Fig.4. Kono further discloses that this agency inventory information such as "Inventory Count," "Number of orders," and "Order Backlog" are stored on and "controlled by the database server 23" and that "these data can be analyzed by general purpose

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spreadsheet software." EX1007, ¶[0026], Brief Description of Drawings, Fig.2. POSITA would have understood from these disclosures that Kono expressly discloses making available the "contents of" this form (including, *e.g.*, channel-specific inventory and shipping information) to the channel interface so that information in the form can be kept up to date with inventory and shipping information (received from, *e.g.*, the "Agency communication control computer" by the DB server) and can be used to determine whether inventory should be reallocated between Kono's agencies. **POSITA at minimum would have found it obvious, straightforward, and advantageous to implement Jacob's disclosed inventory management system (in the recited combinations) using Kono's beneficial disclosure of linking the one or more active channel records to the channel interface.** This would have, *e.g.*, beneficially allowed the system and its users to use and modify the active channel records using Jacob's (or the combined system's) disclosed computer hardware and software to, *e.g.*, set and update pricing information and/or inventory allocations in response to changing market conditions, and enabled the use (and communication to, *e.g.*, the channels) of the data these records contain. This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels," (*e.g.*, EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."), and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" (Kono Summary) and reducing "unnecessary inventory on the market," *e.g.*, EX1007, ¶¶[0011], [0015], [0017]. It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

1[g] receiving, in real time[13] for the one or	**Jacob discloses receiving** (*e.g.*, "receiv[ing]")**, in real time** (*e.g.*, "communication code segment" receives,

[13] I understand that "receiving, in real time" indicates receiving the most recent data "pushed" (sent by the "push" method) from the channels. *See* §VI.C. As discussed below, Jacob (in the recited combinations) discloses or Jacob-Phillips/Jacob-Phillips-Franklin (in the recited combinations) at minimum renders

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more participant channels corresponding to the one or more active channel records linked to the channel interface, sale data corresponding to at least one or more additional vendor computing devices;	*e.g.*, "information" pushed from sales channels; "confirmation information is sent to… the property"; *see also* "application sends… notifications to the PA via communications over wired or wireless networks"; receiving information in "real time" over "Internet," "wired or wireless networks," etc. (*see* cl.1[b])) **for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[c]-[d], [f])**, sale data**[14] (*e.g.*, "information received from the sales channels" including, *e.g.*, "reservations," "reservation engine data," "sales channel data," reservation "confirmation information" including "Rate Type," "selling rate," "rooms sold" (Fig.42) on "day," "number of rooms in the reservation") **corresponding to at least one or more additional vendor computing devices** (*e.g.*, regarding inventory (*e.g.*, "hotel rooms," "time-dependent inventory") corresponding to an additional vendor computing device (*see* cl.1[a]) of, *e.g.*, an additional "Superuser"/"Engine Administrator"/"Property Administrator[]"resulting in multiple "clients" from, *e.g.*, the same company (*e.g.*, at same or multiple "Properties" of the same company

this obvious. As discussed below, to the extent "in real time" is construed to require that the input and processing of data occur concurrently with an external activity and in time to affect that activity, Jacob (in the recited combinations) also discloses or at minimum renders obvious receiving "in real time" under this interpretation.

[14] Jacob discloses "sale data" as required by cl.1[g]. To the extent it is argued further disclosure is required, as discussed below Jacob in view of Tamura, or Jacob in view of Kono, renders obvious "sale data."

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	(*e.g.*, hotel chain))—selling through the same channel)**.**[15, 16] **Tamura discloses receiving** (*e.g.*, "merchandise distribution management server" "receives sales information from POS terminals at each retail store") **sale data** (*e.g.*, data reflecting "number of units sold") **for one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d])**.** **Kono discloses receiving** (*e.g.*, "acquir[ing]") **sale data** (*e.g.*, "product shipment information and product inventory information of each agency"; "agency sales information") **for one or more participant channels**

[15] Jacob expressly discloses implementing RezTrip's "clients" such that "Individual Properties" are each clients, and thus multiple properties within, *e.g.*, a single hotel chain (*e.g.*, different "Taj" hotels) are each a RezTrip "client," each with at least one user (*e.g.*, "Superuser"/"Engine Administrator"/"Property Administrators," "hotel owners/employees") (*see* EX1004 (Jacob), Fig.12) with an associated vendor computing device to, *e.g.*, interact with a RezTrip computer/server (including its database). *See* EX1004 (Jacob), Fig.12 (listing multiple "Taj" properties).

[16] In addition, POSITA would have recognized that it would have been obvious and advantageous to use sale data corresponding not only to multiple vendor computing devices of Properties/groups of properties of the same, *e.g.*, hotel chain, but also to use sale data corresponding to vendor computing devices of Properties/groups of Properties of different hotel chains/companies selling on the same channel. This would have, *e.g.*, beneficially provided additional sale data based on which the RezTrip application would have determined a performance indicator used to make repricing decisions in, for example, situations in which there was not enough sale data from Properties belonging to a single hotel chain/company (*e.g.*, very few rooms available for sale from a particular hotel chain's/company's Properties) to determine a performance indicator.

	(*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d])**.** **Franklin discloses receiving** (*e.g.*, "data is sent… to one other machine" that receives it; "data delivery") **data** (*e.g.*, "data") **in real time** (*e.g.*, data transmitted by "push,") **from another computer** (*e.g.*, "data is sent from a data source")**.** "Hotel reservation systems have been previously described, for example in U.S. patent application publications 2002/0152100, 2003/0144867, 2004/0249684, and in U.S. Pat. Nos. 5,832,451 and 5,832,454 all of which are hereby incorporated herein by reference. In addition to a system that accepts reservations, ***administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace***, pricing and repricing inventory as necessary ***based upon changes in availability***, reservation date, weather, ***and other factors***. The system should allow the administrator to change the pricing of all items based upon class, occupancy, discounts, package deals, preferred client, or any other factor affecting price, with a minimum of data entry by the staff. While current systems support the marketing of package deals, administrators would benefit from a system that would allow consumers to define their own package deals, tailored to their individual preferences. ***The system should quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time. Such a system would insure that each sales channel would always be working with the most up-***

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	to-date pricing, availability, and other information." EX1004, ¶[0005]. "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an analysis code segment, a revenue enhancement code segment, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware. The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" EX1004, ¶[0006]. "***The system may be configured to communicate with the hotel staff, the hotel property management database, and a plurality of selling channels, for example global distribution systems (GDS's) such as Apollo™ or Sabre™, telephone reservation systems, a hotel web site, consolidator web sites such as Expedia™ or Travelocity™, computerized reservation systems, and tour operators. The system allows hotel users to log into the system, check current room pricing and inventory information, change current pricing and inventory information, and distribute the updated pricing and inventory information to the***

	sales channels. The system also allows the hotel operators to distribute information related to other items for sale, allowing hotel patrons to create a dynamic al-a-carte package deal for themselves." EX1004, ¶[0007]. "The system comprises a pricing code segment configured to allow the property administrators to manage room pricing information. The pricing code segment comprises the pricing functions. The prior art pricing change process is illustrated in FIG. 4. A property administrator wishing to change rates for rooms must manage each room type, rate type, date, and constraint type combination individually. As the number of room types, rate types, dates, and constraints grow, the task of changing and/or managing the information grows geometrically. As illustrated in FIG. 5, embodiments of the invention define a matrix of relationships between room types, rate types, and room constraints. The pricing code segment functions by basing room prices upon the price of a standard room offered at the best available rate (BAR). For example, a standard single occupancy room may be offered at a particular BAR. The hotel user then enters the rates of the other rooms as a function of the BAR. Double occupancy may command a rate of BAR plus an extra person charge, triple occupancy may command a rate of BAR plus 2 times the extra person charge. A deluxe room may be priced at 15% above BAR, or $50 above BAR, or some other figure based upon BAR. Prices based upon combinations of room type, occupancy, special discounts, group discounts, and preferred client pricing may be set. Once the matrix of the dependencies upon the BAR are set, the system can calculate the prices of the available rooms. The matrix of BAR dependencies needs only to be set once.

	Subsequent room pricing changes may be implemented by changing only BAR. The rest of the room prices and rates can be calculated automatically based upon the matrix of BAR dependencies. Individual room prices may be set manually, overriding prices calculated by the matrix of BAR dependencies. ***Once pricing changes have been implemented the results may be distributed through the communication code segment or code segments to the sales channels.*** By defining a matrix of relationships or hierarchies between room types, rate types, and constraints, embodiments of the invention allow PA's to modify one rate, for example the BAR rate of a standard room type, and have other rates (floating rates) automatically changed as illustrated in FIG. 6." EX1004, ¶[0008]. "In addition to distributing information to the sales channels, the system may contain a code segment configured to accept reservations. ***The incoming information is used to make reservations, keep the hotel room inventory information up to date, and to allow confirmation of hotel reservations***." EX1004, ¶[0009]. "The system may further comprise a revenue management code segment. The ***revenue management code segment is used to analyze the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." EX1004, ¶[0010]. "As used herein Superuser, or SU, refers to the user or group of users that can perform every action in the

	system ***across any portal and Property that exist in the system***. The SU has complete authority to manage any function available in the system." EX1004, ¶[0064]. "As used herein an Engine Administrator, or EA is a user or group of users, similar to the Superuser, who can perform every action in the system, but only on properties and users which they have created in the system. An EA cannot view or edit details on properties/users created by other EA's." EX1004, ¶[0065]. "As used herein a Property Administrator or PA is a user or group of users who are the owners/employees of ***properties that are managed with the system***. The PA is responsible for configuring and maintaining daily rates, the inventory, and the property features that show up via the reservation engine." EX1004, ¶[0066]. "As used herein ***a Portal refers to a Property or series of Properties managed as an entity. Users of the system may comprise owners of individual properties, owners of multiple properties, and others who may not own properties but instead agree to sell groups of rooms on a contract basis***. A direct Portal refers to all the Properties that are directly utilizing the services of the reservation engine. An indirect Portal refers to Properties that have contracted some or all of their rooms to an intermediary, and the intermediary has chosen to use the services of the reservation engine. A single physical Property can be part of either a direct portal or an indirect portal, or both. A portal is a logical grouping of rooms and/or properties that allows one

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	person to manage groups of Properties/Rooms from a single point." EX1004, ¶¶[0069]-[0070]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, ***and at least one communications code segment configured to manage communications between the system and a plurality of sales channels.*** The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the

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	invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. ***Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser.*** User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." EX1004, ¶[0083]. "***Embodiments of the invention comprise a computerized database such as Oracle™, SQL Server™, DB2™, MySQL, Microsoft Access™ or other relational or non-relational databases.*** The database is configured to manage hotel data comprising portal data, property data, room type data, rate type

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	data, room hierarchy data, rate grid data, inventory data, add-on data, package data, policy data, bed type data, pricing data, user data, availability data, date data, amenity data, facility data, constraint data, audit trail data, engine customization data, sales channel data, communications data, and other data. In addition, ***embodiments of the invention comprise code segments configured to interact with the database***, to interact with users (EU's, SU's, EA's, and PA's), ***and to communicate with other systems, such as sales systems (sales channels) of vendors. Communications may be encrypted or unencrypted and may take place on wired or wireless networks.***" EX1004, ¶[0084]. "The system RezTrip™ is an exemplary embodiment of the invention and will be described below. ***As shown in FIG. 7, the RezTrip™ system communicates with the hotel user, the hotel property management system, tour operators, internet web merchants, reservation call centers, GDS systems, and the hotel's own website.*** It is to be understood that the elements comprising the invention may be embodied in other programs and that the description of the RezTrip™ embodiment is for illustrative purposes only and is not intended to limit the invention to the specific embodiment described." EX1004, ¶[0085]. "The basic workflow of the system is shown in FIG. 8. An EA or SU adds a Property to the system. The data relating to the Property are stored in the system database. The EA or SU then associates a PA with the property. The PA administers the Property, initially by entering relevant Property information such as descriptions, room types, room rates, amenities, facilities, and policies, and later by managing inventory

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	and room rates. Once the PA has set up the Property within the system, ***EUs may connect to the reservation engine, either directly or through intermediaries, select a room, and make a reservation. After an EU has made a reservation, confirmation information is sent to both the EU as well as the Property***." EX1004, ¶[0086]. "Upon login the SU is presented with the option of ***picking the portal they want to work*** within as shown in FIG. 13; no other action is possible until a portal has been chosen. After choosing a portal, menu functions become available. While a SU may perform all system and property management functions, properties are generally managed by less privileged EA and PA users." EX1004, ¶[0088]. "The portal code segment is configured to manage Portal data and comprises Portal functions. ***A Portal refers to a Property or series of Properties managed as an entity.***" EX1004, ¶[0092]. "The ***RezTrip™ application may have clients*** that comprise: A group of Properties Individual Properties Companies who may not own Properties, but have bought batches of Rooms from other properties to sell to clients. A management company or chain that owns several properties." EX1004, ¶¶[0093]-[0097].

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	"As shown in FIGS. 13, 14, and 15, the system allows SUs to select portals; create new portals, enter portal data, to edit portals, and to activate/inactivate portals. ***Portals are created, edited, and activated/inactivated by clicking on the appropriate menu items on the relevant screens and entering the required data in the forms. Each portal may have Properties and users created within it. The associations between a Property and users are performed within the scope of a portal. A Property from one portal cannot be associated with an EA or a PA from another portal.*** EAs operate within the portal with which they are associated. SUs may operate on any portal in the system." EX1004, ¶[0099]. "***During the course of working with a Property all SU, EA, and PA users are clearly shown the portal and the Property to which they are making changes.*** The administrative users (SU, EA, PA) have the ability to change Properties, to move from one Property to another. ***If the user is logged on as SU then the user also has the ability to change portals.***" EX1004, ¶[0111]. "As shown in FIG. 17, the PA enters property data on the "Add Property"screen. The data comprise address information including street, city, state, country, postal code, as well as radio buttons indicating whether to display special rate types, default amenities, default property facilities, default bed types, and default common room attributes. ***After a Property has been added to the system it may be managed by selecting it from the Property list, as shown in FIG. 18. Selecting***

	a Property from the Property list brings up a form displaying the default Property information as shown in FIG. 19. Default information comprises reservation transaction fee, active/inactive status, low inventory alert level, guarantee/cancellation policy, minimum room price, default currency, default date format, and check-in/check-out times." EX1004, ¶[0113]. "Each Room Type within the system will be entered with a default selling rate along with the inventory for each calendar date. However, the same rate may not be offered to everyone. In certain instances a discount may be offered to a group of EUs. Therefore, the code segment provides functionality to associate various Rate Types with each Room Type for a given date. For example, the rate for a standard room across a series of dates could be as follows:"

	Standard Room-		
Rate Type	04/11/05	04/12/05	04/13/05
Default Rate	$139	$159	$199
AAA ™ Rate	$126	$144	$180
Government Rate	$130	$150	$190
Summer Package Rate	$100	$100	$100

EX1004, ¶[0123]; *see also* EX1004, ¶[0124].

"The Room Type and room rate that is shown to an EU using the reservation engine is based upon a rate grid that is maintained by the PA." EX1004, ¶[0125].

"Communicate the prices to a plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or***

	communicate in response to a user initiated triggering event, such as a mouse click." EX1004, ¶[0133]. "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." EX1004, ¶[0176]. "The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" EX1004, ¶[0185]. "The ***communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions***. Once the Rate Types, Room Types, and inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels. Other information communicated to the selling channels may comprise add-on information, package

	information, amenity information, and facility information. ***The information is communicated to the selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click.*** As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such as the internet*** or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form." EX1004, ¶[0191]. "The reservation engine code segment is configured to manage reservation engine data and comprises reservation engine functions. ***When an EU, using the reservation engine, successfully completes a reservation, a confirmation is sent to the EU. The application also notifies the PA to allow the administrator to perform the associated financial and administrative tasks.*** The application sends confirmations to the EUs and notifications to the PA via communications over wired or wireless networks in either an encrypted or unencrypted form. Typically, the communications will comprise an electronic mail message or a facsimile message." EX1004, ¶[0192].

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Multiplier	Details
Per stay	The charge would be added to the reservation and is not dependent on the number of travelers. It is multiplied by the number of rooms in the reservation. For example, high-speed internet priced at $50 If 3 rooms were booked the total charge would be $150.
Per occupant per stay	The charge would be per occupant for the duration of the stay. It does not depend on the number of nights. For example, airport pickup, $8 per person.
Per night	This is a charge per room per night. For example, parking, $24 per night.
Per occupant per night	For example, breakfast at $12. For 3 persons for a 3 night stay, the total charge would be $108 (12 × 3 × 3).

E.g., EX1004, ¶[0220].

"The system of claim 1 further comprising ***a code segment configured to communicate pricing information and inventory information to a plurality of sales channels***." EX1004, cl.5; *see also* EX1004, cl.1.

"The system of claim 5 further comprising ***a code segment to automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***." EX1004, cl.6.

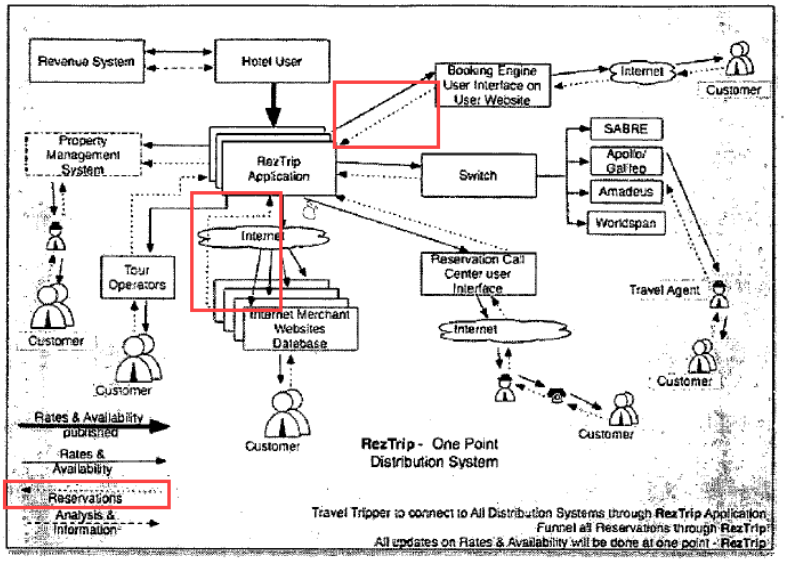


Figure 7

EX1004, Fig.7.

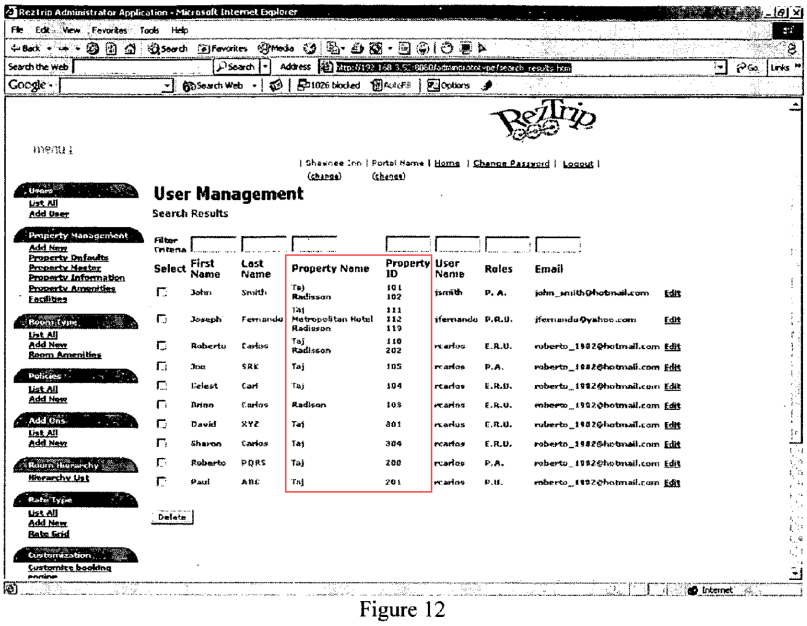


Figure 12

EX1004, Fig.12.

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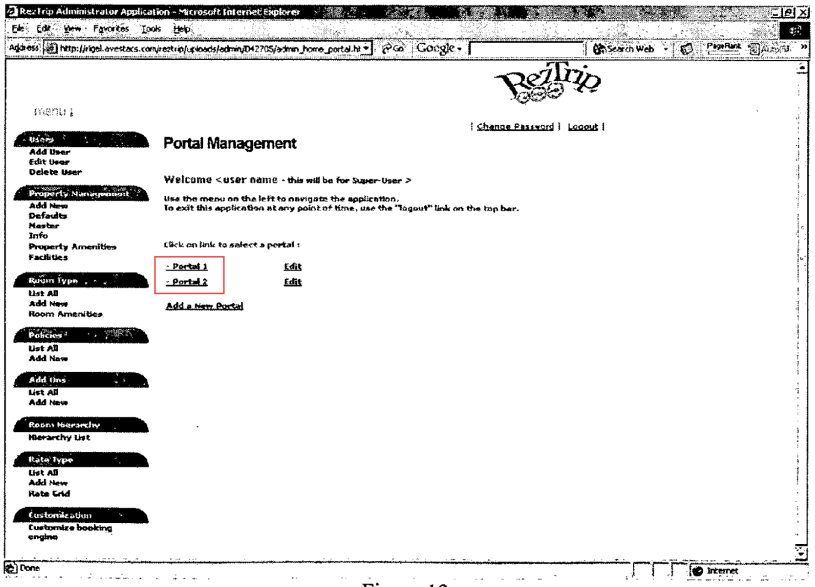


Figure 13

EX1004, Fig.13.

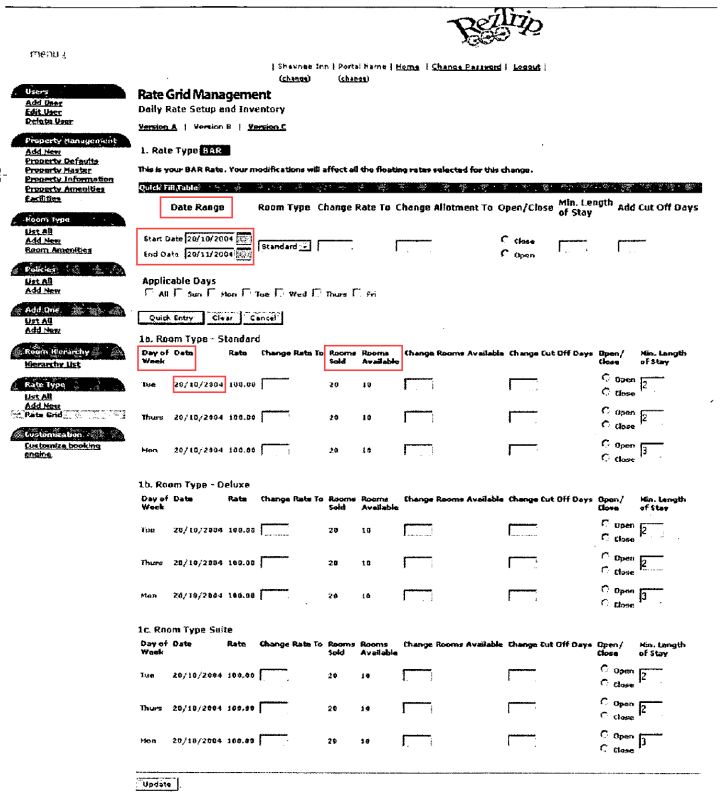


Figure 42

EX1004, Fig.42.

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	"The invention is provided with a price determination part 22 that determines the reference retail price for items sold based on the ***amount of inventory and the number of parts sold during the part period for each item sold which is stored in a merchandise distribution management server 10***; an allocation calculation part 24 that calculates the allocation quantity of the items for each retailer; an allocation buying price calculation part 26 that calculates the allocation buying price for each retail outlet based on the allocation quantity of the items; a buying price at the time of sale calculation part 28 that calculates the stocking price of the sold item based on the reference retail price at this stage when the purchased items based on the allocation quantity are sold by each retailer; and a returned goods settlement amount calculation part 29 that calculates the returned goods settlement amount according to the unsold quantity and returned goods fee for the items purchased by each retailer based on the quantity allocated thereto." EX1005, Means of Solving the Problems. "The sales management system of the invention, for example, as shown in Fig 2, preferably further comprises ***a sales rep part 50 that manages the sales progress rate for each retailer of the items among a predetermined number of retailers based on the allocation quantity***; and the sales rep part 50 is authorized to transfer the items from retailers having a ***low sales progress relative to the allocation quantity to retailers having a high sales progress rate***." EX1005, ¶[0013].

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	"The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100)***; a step to determine the reference retail price ***based on the inventory quantity of the items and the number of units sold*** during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." EX1005, ¶[0014]. "Fig. 1 is a block diagram of the overall configuration of a sales management system illustrating a first embodiment of the invention. ***In the figure, the sales management system 20 is connected to a merchandise distribution management server 10 and to point-of-sale (POS) terminals which are installed in each retail store and a communication line such as a wide area network (WAN) or Internet communication network. The merchandise distribution management server 10 records the amount of inventory for each item of merchandise sold and the number of units sold during a specific unit period.*** For example, ***the server receives sales***

	information from POS terminals at the retail stores, manages the number of units sold for each item of merchandise sold at each retail store, and ensures merchandise distribution so that no shortages occur. The merchandise distribution information from the merchandise distribution management server 10 is also transmitted to the manufacturers' production planning teams to be reflected in the production of merchandise at the factories and used to make decisions on additional production, etc. On the manufacturer's side, sales department personnel use the merchandise distribution information from the merchandise distribution management server 10 to process sales information from the retailers for use in managing regional sales trends and customer segments, as well as to evaluate the selling capabilities of each retailer." EX1005, ¶[0017]. "The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10.*** For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period)

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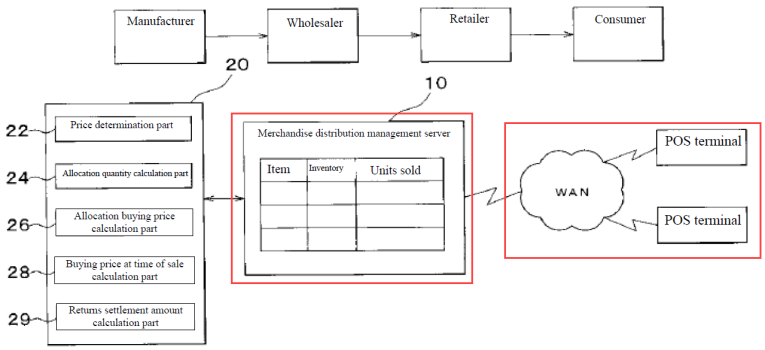
	of the merchandise, and with reference to the merchandise's distribution market." EX1005, ¶[0019]. "Following is a description of the flow of merchandising transactions in the sales management system thus configured. Fig. 2 is a flowchart describing the sales management method. ***First, the inventory quantity for each item of the sold merchandise and the number of units sold during the unit period are stored in the merchandise distribution management server 10 (S100), as well as the retailer identification information of the sold merchandise. Additionally, the merchandise distribution management server 10 also stores information related to each item of sold merchandise, such as the item number, allocated buying price, reference retail price, sold purchase amount, and returned goods settlement amount.*** Such information related to each item of merchandise sold may be identified and managed, for example, by means of tags attached to the merchandise sold." EX1005, ¶[0024]. "Next, the price determination part 22 sets a reference retail price ***based on the inventory quantity of the item in question and the number of units sold during the unit period as stored in the merchandise distribution management server 10*** (S102). The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based

	on the allocation buying price and the allocation quantity of the item." EX1005, ¶[0025]. "Next, the time-of-sale purchase-price calculation unit 28 calculates the sold purchase price, based on the reference retail price, at the stage when the item purchased based on the allocation quantity is sold at each retail store (S108). Each time the item is sold, at each retail store, ***sales information is transmitted from the POS terminal to the sales management system 20 and the merchandise distribution management server 10***." EX1005, ¶[0026]. "Fig. 3 is a block diagram of the general configuration of a sales management system which illustrates a second embodiment of the invention. This embodiment shows a situation in which merchandise is allocated not only by a merchandise planning entity such as a manufacturer, but also merchandise which is purchased by retailers that are handled as a group***. In the figure, the sales management system 20 is connected to the merchandise distribution management server 10, to the POS terminals installed in each retail store, and to a network, as well as to the supervisor part 40 and to the sales rep part 50.*** The sales management system 20 is designed to handle both merchandise allocated by a merchandise handling entity such as a manufacturer and merchandise which is purchased by retailers, and in addition to the value determination part 22, the allocation quantity calculation part 24, the allocation purchase price calculation part 26, the purchase price at time of sale calculation part 28, and the returned goods settlement amount calculation part 29 as described in Embodiment 1, the system also includes purchased

	merchandise quantity receiver part 32 and a purchased buying price calculation part 34." EX1005, ¶[0031]. "***The supervisor part 40 is authorized to manage the sales of merchandise purchased by the retailers based on the allocation quantities of the merchandise as set by the merchandise planning entity, and to manage the return of merchandise purchased by the retailers based on the allocation quantities using, for example, computers or information processing terminals which are connected to a communications network. The supervisor part 40 is connected to a number of sales rep parts 50 within the scope of its management and can adjust the quantity of merchandise allocated to the retailers by the merchandise planning entity at any time based on information from the merchandise distribution management server 10 about the merchandise in question.*** The supervisor used by the supervisor part 40 is responsible for the sale of merchandise sent in by the merchandising entity; however, it is not responsible for sales performance of unsold merchandise ordered by retailers as merchandise which they have purchased. The supervisor's authority to transfer merchandise between retailers is underpinned by the fact that the allocation quantity of merchandise can be returned to the merchandising entity. In other words, the supervisor also has the authority to approve a retailer's request to return an allocated quantity of merchandise to the merchandising entity." EX1005, ¶[0034]. "The sales rep part 50 manages the sales progress rate for each retailer with respect to the items between a predetermined number of retailers based on the allocation quantity. The sales rep part 50 has the

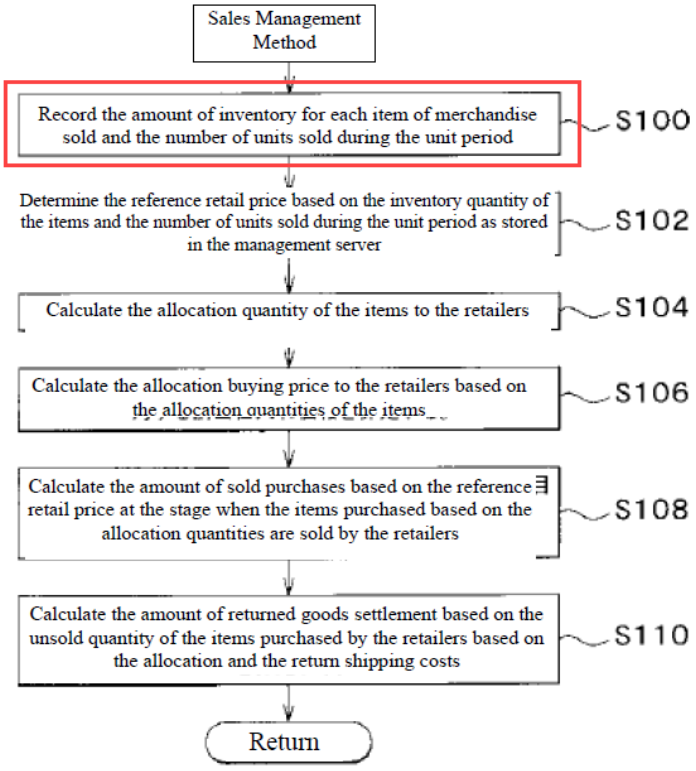
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	authority to transfer items from a retailer with a low sales progress rate in relation to the allocation quantity to retailers with a high sales progress rate. ***A computer or information processing terminal connected to a communication line network may, for example be used. Sales reps (sales managers) who use the sales rep part 50 have a shared incentive to maximize sales within a group of merchandise among retailers and merchandise planning entities.*** For example, sales reps are assigned to a certain area by region, and if a certain product is not selling well at certain retailers within their area, they have the authority to transfer the merchandise to another retail store under their jurisdiction." EX1005, ¶[0035]. "The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate." EX1005, cl.4. A sales management method for executing each step using a computer: ***recording the inventory and the number of units sold during the unit period for each item of merchandise for sale***; determining the reference retail price based on the inventory and the number of units sold during the unit period of the item as stored in the management server; calculating the allocated quantity of the items for each retailer; calculating the allocated stocking price of the items for each retailer based on the allocated quantity of the items; calculating stocking price of the sold item based

	on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and calculating the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity." EX1005, cl.5. Fig. 1  EX1005, Fig.1.

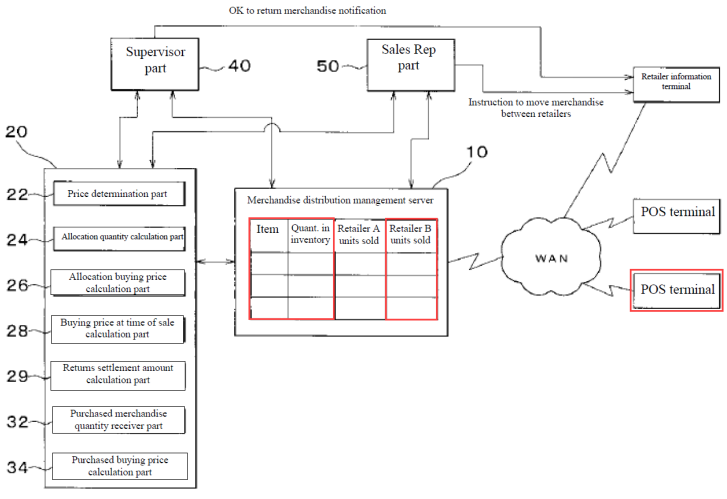
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Fig. 2



EX1005, Fig.2.

Fig. 3



EX1005, Fig.3.

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	"[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, the manufacturer server device is provided with: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses. Moreover, the above configuration is further provided with: ***an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means***; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and the sales index of each agency stored in the agency shipment information database and the sales index database, estimate the sales volume of the product on the overall market and performs a sales analysis at each agency." EX1007, ¶[0009]. "According to the present invention having such characteristics, by connecting the manufacturer server

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	device and the terminals of each agency by a direct network, ***the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each agency in real time***. The manufacturer server device estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and monthly sales index data of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, transfer (resale, etc.) of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." EX1007, ¶[0010]. "According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network***, can acquire product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time***. The maker estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and sales index of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." EX1007, ¶[0014].

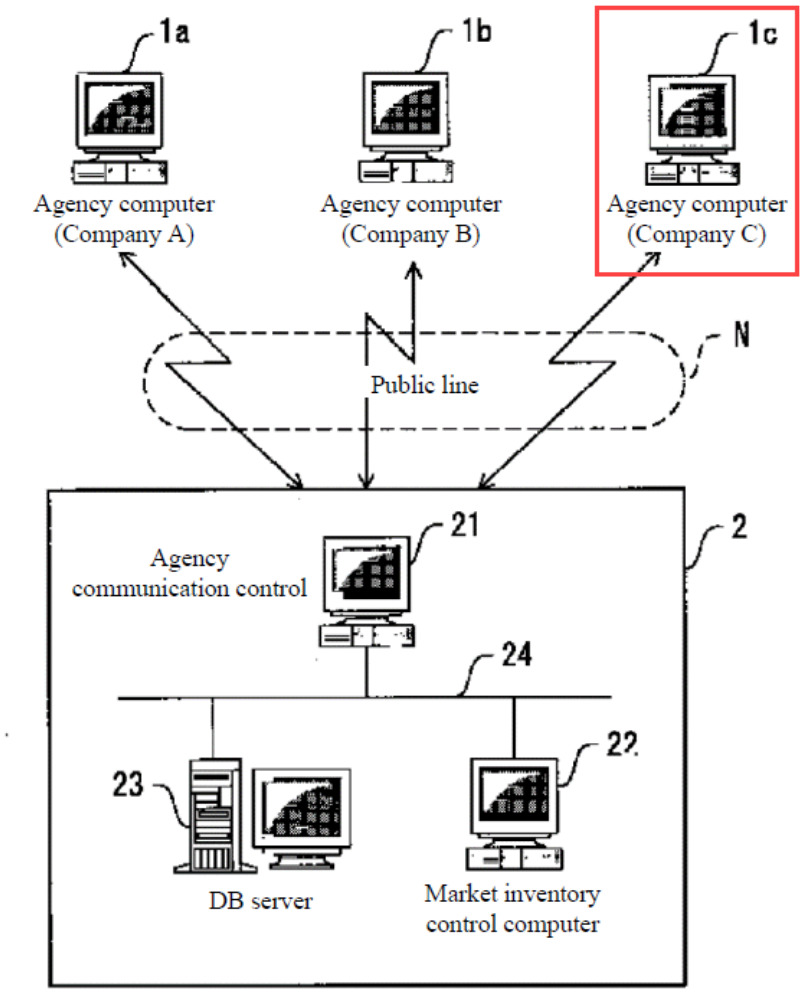
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	"This system is configured such that agency terminals 1a, 1b, 1c, ... installed at each agency having transactions and a server device 2 of the manufacturer (maker side) are connected via a network (public line) N. However, the agency terminals 1a, 1b, 1c, ... and the manufacturer server device (hereinafter referred to as the maker-side server device) 2 may be connected by a communication network such as the Internet." EX1007, ¶[0024]. "Moreover, the maker-side server device 2 is ***configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like***. Moreover, the market inventory control computer 22 is provided with: acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency from each agency terminal 1a, 1b, 1c, ...; analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency; and ***transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instructing transfer between warehouses***." EX1007, ¶[0025]. "FIG. 2 illustrates an example of various databases controlled by the database server 23. Three kinds of

	databases controlled by the database server 23 are prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the ***agency sales information database 23b***. Moreover, monthly sales indexes of the previous year and current year are saved in the sales index database 23c. In the database server 23, these data are updated daily so that the data can be stored and analyzed. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software." EX1007, ¶[0026].

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[FIG. 1]



EX1007, Fig.1.

[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

EX1007, Fig.4.

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	"The first distinction we make among data delivery styles is that of 'pull v. push.' Current database servers and object repositories manage data for clients that explicitly request data when they require it. When a request is received at the server, the server locates the information of interest and returns it to the client…In contrast, data dissemination involves sending information to a client population, possibly in advance of any specific request. This is referred to as a *push-based* approach… A pull-based approach requires the use of a backchannel for each request. Furthermore, the server must be interrupted continuously to deal with such requests and has limited flexibility in scheduling the order of data delivery." EX1009, ¶¶[0015]-[0016]. "Both push and pull can be performed in either an aperiodic or periodic fashion. Period delivery is performed on a regular, repeating schedule, while aperiodic has no such schedule." EX1009, ¶[0018]. "Periodic push is useful for cases in which clients might not be available at all times or might be unable to react to what has been sent. Unavailability can occur in mobile settings. It *might also occur in cases in which the client processing load is high*, this preventing the continual servicing of the incoming data stream…" EX1009, ¶[0019]. "Push Scheduling: For the push-based approaches, intelligent scheduling is necessary in order to obtain the maximal benefit from the available bandwidth…" EX1009, ¶[0041].

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	"The third characteristic of data delivery mechanisms we identify is whether they are based on point-to-point or one-to-N communication. Using point-to-point, *data is sent from a data source* (*e.g., a single server) to one other machine…"* EX1009, ¶[0021]. *See* EX1009, Fig.1 (especially Push→Periodic→P-to-P and Push→Periodic→P-to-P).

For example, Jacob expressly discloses that its system (*e.g.*, system running "RezTrip" Application) may have multiple users from the same company (*e.g.*, at the same or another "Property" in a particular hotel chain (each of which is a RezTrip "client")) selling through the same channel, and that Jacob's system includes "computer software or computer hardware or a combination of computer software and hardware" used by its users. *E.g.*, EX1004, ¶¶[0006], [0069], [0093]-[0097]. With respect to "vendor computing device" (*see* cl.1[a]), POSITA would have understood that Jacob expressly discloses multiple vendor computing devices corresponding to each of its vendors (*e.g.*, "Properties," or "groups of Properties" of the same company (*e.g.*, hotel chain) that sell through Jacob's plurality of sales channels) to *e.g.*, exchange information with a RezTrip computer/server (including its associated "database"), or at minimum **would have found it obvious to implement Jacob (in the recited combinations) to do so**. POSITA would have further understood that the RezTrip computer/server receives sale data with respect to each of these additional vendor computing devices. Indeed, Jacob expressly discloses that the RezTrip application manages inventory for multiple Properties (*e.g.*, EX1004, ¶¶[0095]), "receive[s] information from the sales channels" (including whether all of a "sales channel's Room Type inventory is sold out," *e.g.*, EX1004, ¶[0180]) (*e.g.*, EX1004, ¶[0010]), and that "all Reservations" are "funnel[ed]" "through RezTrip," (*e.g.*, EX1004, Fig.7). **POSITA would thus have understood that Jacob expressly discloses at least one or more additional vendor computing devices, and receiving sale data corresponding to such computing devices.** At minimum, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob's (in the recited combinations) disclosed companies (*e.g.*, hotel chains) with multiple properties**

(each of which is a RezTrip "client") using Jacob's disclosed computer software/computer hardware/combination of computer software/hardware such that the resulting system utilized one or more additional vendor computing devices (for use by, *e.g.*, Jacob's additional users of a company's property/properties), and received sale data corresponding to such additional vendor computing devices. This would have, *e.g.*, beneficially allowed the system and its additional clients/users/Properties to, *inter alia*, modify the active channel records using Jacob's disclosed computer hardware and software to, *e.g.*, update pricing information and/or inventory allocations in response to changing market conditions across multiple products from different vendors (*e.g.*, "Properties" of the same company (*e.g.*, hotel chain) within each channel, thus enabling updating of pricing information and/or inventory allocations based on conditions relating to the overall market for, *e.g.*, a hotel chain's inventory rather than just the market for a single vendor's inventory from, *e.g.*, a single hotel in the chain (or the inventory items associated with a single person/representative or group within a vendor). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels." *E.g.*, EX1004, ¶¶[0002], [0010], [0154] ("A property does its bookings through various channels… in order to maximize occupancy rate and maximize room rate."). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

Because Jacob's channels "push" data to RezTrip computer/server, without the system issuing a request (*e.g.*, EX1004, ¶[0086] ("After EU has made a reservation, confirmation information ***is sent***")), **POSITA would have understood Jacob discloses receiving this "pushed" sale data in "real time**" (as soon as a reservation is made, *i.e.*, on an aperiodic basis). *See* §VI.C of my declaration.

To the extent it is argued further disclosure of "real time" as properly construed is required with respect to Jacob's disclosure of push, **this would have been rendered obvious based on Jacob (in the recited combinations) in view of Franklin**. Jacob also discloses the preference for updating pricing and availability in "real time" (*e.g.*, EX1004, ¶[0005]) and that "[f]requent updating and communication… keeps the information fresh at the sales channel," *e.g.*, EX1004, ¶[0185]. However, while Jacob discloses sale data is transmitted from the

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channels without a request, Jacob does not use the word "push," and Jacob's push is aperiodic. Franklin explicitly discloses beneficially ***pushing*** data from a data source, and explains that among the advantages of push is that, unlike pull, push does not require a "backchannel" for each request, nor must the nodes providing the data (here, Jacob's sales channels) be continuously interrupted to deal with such requests (in both instances meaning less strain on, *e.g.*, Jacob's wireless communication networks (*e.g.*, EX1004, ¶[0082]), which may reflect network and other asymmetries). *E.g.*, EX1009, ¶¶[0006], [0005]-[0010], [0013], [0016], [0020]. Franklin additionally explains data sources can push data "in either an aperiodic or periodic fashion," and that ***periodic*** push (pushing data on a "***regular, repeating schedule***, while aperiodic has no such schedule") is particularly useful where processing load is high at the node receiving data (another asymmetry), as Jacob's processor(s) running, *e.g.*, this function of the RezTrip application also performs the other functions of the RezTrip application. *E.g.*, EX1009, [0018]; *see also id.* [0019]-[0020], [0014], Fig.1. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement communications between Jacob's channels and Jacob's RezTrip computer/server (in the recited combinations) using Franklin's beneficial teachings of push, including periodic push**. Periodic push would have beneficially allowed the system to "obtain the maximal benefit from the available bandwidth" as Franklin explains (*e.g.*, EX1009, ¶[0042]), and does not "assume[] that clients are either always listening and able to respond to what is being sent or that missing some information is not crucial to the application" (*e.g.*, EX1009, ¶[0019]). Further, periodic push affords POSITA a design option as to how frequently to schedule the push, providing increased flexibility, as POSITA would have recognized different benefits to scheduling push at very short or longer intervals, depending on the particular practical application under consideration.[17] For example, Jacob acknowledges the benefit of "[f]requent

[17] Jacob teaches sending sale data as soon as the reservation is made (*i.e.*, aperiodically). *E.g.*, EX1004, ¶[0086]. To the extent it is argued that Jacob does not disclose this limitation under this interpretation, Franklin teaches aperiodic push. *E.g.*, EX1009, ¶[0026]. Though there are tradeoffs between periodic and aperiodic push, aperiodic push (like Jacob's transmission when data changes) ensures bandwidth is only used when there's an update and ensures the server has the most up to date information (similar to the benefits of periodic push at short intervals), and it would also have been obvious and advantageous to implement

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updating" (*e.g.*, EX1004, ¶[0185]) and it would have been beneficial and obvious based on Jacob's disclosures above to implement Jacob's updating using Franklin's teachings of periodic push to schedule push at ***short intervals*** because this would facilitate Jacob's computer/server (running, *e.g.*, the RezTrip application) having more up-to-date information when processing the sale data. However, in other circumstances, such as in applications where individual sales and reallocations were expected to occur less frequently and where cost/efficiency concerns were a higher priority than near-term predictive accuracy, POSITA would have recognized it was beneficial to schedule push in the combined Jacob-Franklin system at ***longer intervals*** because, as of the priority date, sending data could be expensive and error-prone, and sending data less frequently in batches would generally have presented lower costs/more efficiency. And, whether with shorter or longer intervals (as discussed above), POSITA implementing Franklin's express teaching of periodic push (on a "regular, repeating schedule") in Jacob would additionally have found it obvious and advantageous to ***schedule each channel to push data in the same sequence in the same repeating interval*** (*e.g.*, every minute, every hour, or a smaller or greater interval as appropriate to the particular products and channels), with each channel associated with a different interval in the sequence, so that Jacob's processor would receive and be able to act on (*i.e.*, process) the new sale data for a channel in the same sequence in the same, repeating interval while additional sale data was being acquired for the *other* channels, beneficially: (a) allowing Jacob's processor to receive and process sale data from one channel at a time in succession (including processing rapidly in, *e.g.*, rapid succession), thus increasing efficiency (and enabling faster speeds) while lowering processing load, latency, and overhead (including, *e.g.*, reducing the management required to deal with the possibility of collisions—data coming to the processor from different channels at the same time), and (b) allowing Jacob's processor to calculate new prices and reallocate inventory promptly after the last channel's data was received and processed. For POSITA it would have been routine to make these implementation choices, and (again, particularly in light of

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Jacob (in the recited combinations) using Franklin's teachings of aperiodic push with REOS. *See* EX1009, ¶[0026]. Additionally, both periodic push and aperiodic push were well-known, well-understood implementation choices that POSITA would immediately have recognized as among the design options available for implementing Jacob's system.

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the express disclosures of Jacob and Franklin, and the existence of other similar systems using push transmission and calibrating to particular circumstances) clear they would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1029[18] (discussing existing use of push (*e.g.*, at 135-136 ("*Periodic updates* occur at scheduled intervals"; "*Event driven updates* [that] are triggered by events such as a **booking class closing**, a change in aircraft, and an **unanticipated spike in demand**.") (italics original), and context-specific timing based on "cadence" of transactions (*e.g.*, at 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***. Revenue managers review the recommendations of the system on a daily basis. ***Other companies may update prices weekly or monthly***. In any case, the ***core operational activities will be similar***."), 30 ("In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations"), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity. As discussed in Chapter 1, the adoption of computerized distribution systems—an early form of e-commerce—by the passenger airlines was a direct contributor to the ability of the airlines to develop, manage, and update highly complex fare structures.[] ***Pricing has a different cadence in every industry***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both

[18] To the extent it is argued that further disclosure of event-triggered updates is required, this would have been rendered obvious by the disclosures of Phillips (which is already part of the recited combinations) for the same reasons as those set forth immediately above for Franklin.

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necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***. In effect, the airlines were wrestling with the complexities of e-commerce well before the arrival of the Internet. The necessity to continually monitor demand and update prices accordingly will be felt by more and more industries as electronic distribution channels such as the Internet become more pervasive")))).

Even if, *arguendo*, "real time" required that data be sent relatively quickly/frequently, "real time" in the temporal sense (including with periodic push over vanishingly short intervals, which POSITA would have understood would ensure "fresh[er]" data (*e.g.*, EX1004, ¶[0185]) in situations with unexpectedly rapid sales or requests for reallocation/re-pricing) would also have been obvious for the reasons described above. For POSITA it would have been routine to make these implementation choices, and (again, particularly in light of the express disclosures of Jacob and Franklin and the existence of other similar systems with extremely rapid processing/transmission) clear they would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1029[19] (discussing extremely rapid processing/transmission (*e.g.*, at 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking***

[19] To the extent it is argued that further disclosure of "real time" in the temporal sense is required, this would have been rendered obvious by the disclosures of Phillips (which is already part of the recited combinations) for the same reasons as those set forth immediately above.

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requests. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***."), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a **s*trong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity."))).

To the extent it is argued that further disclosure of receiving ***sale data*** is required, **it would have been obvious based on Jacob (in the recited combinations) in view of Kono**. Both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Jacob further discloses receiving sale data such as "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate." EX1004, ¶¶[0086], [0123]-[0125], [0176], [0192]. Jacob further discloses "[f]requent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channel." EX1004, ¶[0185]. And, as discussed, Franklin describes how to efficiently communicate data in a "distributed information system." *E.g.*, EX1009, ¶¶[0001], [0016] ("distributed system infrastructure is responsible for delivering data to all relevant subscribers"). Kono explicitly discloses receiving sale data from each distribution channel. *E.g.*, EX1007, ¶¶[0010], [0014]. Jacob further discloses "[a]fter an EU has made a reservation, ***confirmation information is sent to… the property***." *E.g.*, EX1004, ¶¶[0067] ("Property refers to any hotel, motel, resort or the like that sells its rooms/amenities/packages/items via the system and the reservations engine."), [0086]. Kono further discloses receiving sale data from each distribution channel and that "agency terminals" and "the manufacturer server device" "may be connected by a computerized communication network such as the Internet. EX1007, ¶¶[0024]-[0025]. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's RezTrip**

computer/server (in the recited combinations) using Kono's beneficial teachings of receiving sale data from distribution channels. As discussed, receiving sale data corresponding to the combined system's one or more additional vendor computing devices would have advantageously increased the RezTrip computer/server's ability to fulfill Jacob's express goal of "maximiz[ing]… revenue," and Evangelist's express goal of "promot[ing] efficient operations" of its inventory management system by, *e.g.*, providing the system or user of the system with information about *e.g.*, total inventory sold, and remaining inventory and increasing the ability of the system or user of the system to monitor changing market conditions/demand by reallocating inventory and adjusting price in response to changing market conditions. *See also* EX1004, ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). For POSITA it would have been routine to make such an implementation choice, and (particularly in light of these express disclosures and the existence of similar systems) clear it would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.,* EX1029, 135 ("These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights***"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan.[] ***Each GDS*** distributes schedule, fare, and booking availabilities to the agencies and ***transmits bookings and cancellations from the agencies to the airlines***.").

Alternatively, to the extent it is argued further disclosure of receiving ***sale data*** is required, **it would have been obvious based on Jacob (in the recited combinations) in view of Tamura**. Both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. Jacob further discloses receiving sale data such as "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate." EX1004, ¶¶[0086], [0123]-[0125], [0176], [0192]. As discussed, Jacob further discloses "[a]fter an EU has made a reservation, confirmation information is sent to both the EU as well as the property." *E.g.*, EX1004, ¶¶[0067] ("Property refers to

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any hotel, motel, resort or the like that sells its rooms/amenities/packages/items via the system and the reservations engine."), [0086]. Jacob further discloses "[f]requent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channel." *E.g.*, EX1004, ¶[0185]. And, as discussed, Franklin describes how to efficiently communicate data in a "distributed information system." *E.g.*, EX1009, ¶¶[0001], [0016] ("distributed system infrastructure is responsible for delivering data to all relevant subscribers"). Tamura discloses that sale data is pushed from retailers to the merchandise distribution management server ("each time the item is sold, sales information [sale data, including "number of units sold"]) is transmitted from the POS terminal to the sales management system 20 and the merchandise distribution management server 10") and that Tamura's sales information includes the "number of units sold." *E.g.*, EX1005, ¶¶[0014], [0017], [0019], [0024], [0026], cl.5, Fig.2. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's RezTrip computer/server (in the recited combinations) using Tamura's beneficial teachings of receiving sale data from distribution channels.** Receiving sale data corresponding to the combined system's one or more additional vendor computing devices would have advantageously increased the RezTrip computer/server's ability to fulfill Jacob's express goal of "maximiz[ing]… revenue," Evangelist's express goal of "promot[ing] efficient operations" of its inventory management system, and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, providing the system or user of the system with information about *e.g.*, total inventory sold, and remaining inventory and increasing the ability of the system or user of the system to monitor changing market conditions/demand by reallocating inventory and/or adjusting price in response to changing market conditions. *See also* EX1004, ¶[0005] ("administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace"). For POSITA (particularly in light of these express disclosures and the existence of similar systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.,* EX1029, 135 ("These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights***"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan.[] ***Each GDS*** distributes schedule,

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fare, and booking availabilities to the agencies and ***transmits bookings and cancellations from the agencies to the airlines***.").

1[h] determining a performance indicator[20] in real time,[21] for each of the one or more participant	**Jacob discloses determining** (*e.g.*, "analyz[ing] the information received from the sales channels"; combining (*e.g.*, adding, averaging, etc.) data across individual "reservations"; "perform[ing] calculations automatically[22] and/or perform[ing] calculations in

[20] '047 states a "performance rating can be in the form of a number of parameters. For example, it could be related to a surplus or deficit percentage related to supply and demand of particular inventory items." EX1001, 6:46-49; *see also* EX1001, 4:45-47 ("determination of whether or not supply of inventory to each channel 18 exceeds demand"), 6:25-33. Although '047 uses the phrase "performance indicator," POSITA would have understood that these examples of "performance rating[s]" are also "performance indicator[s]." As discussed further below, POSITA would have recognized that examples of "performance ratings"/"performance indicators" in '047 include parameters that (like Tamura's low and high sales progress rates, etc.) are "related to a surplus or deficit percentage related to supply and demand or particular inventory items" or "whether or not supply of inventory to each channel… exceeds demand," *e.g.*, EX1001, 6:46-49, 4:43-47, 6:25-33.

[21] I understand that, in cl.1[g], above, "receiving, in real time" indicates receiving the most recent data "pushed" (sent by "push" method) from the channels, and that, in cl.1[h], "determining a performance indicator in real time" indicates that this most recent received "pushed" data is processed to determine a performance indicator. In my opinion, under this interpretation, Jacob (in the recited combinations) discloses or Jacob-Phillips (in the recited combinations) renders obvious "determining… in real time." To the extent it is argued that further disclosure of "real time" in the temporal sense is required, this would have been rendered obvious as described above.

[22] I understand that '047 does not require "automatic" performance of steps without human intervention. Rather, '047 expressly contemplates user input to its system. *E.g.*, EX1001, 5:11-14 ("vendors or an administrator… can set a rate of change"), 30:59-67 ("interface used by a vendor"), 31:54-60 ("interface to permit the

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channels corresponding to the one or more active channel records linked to the channel interface, based at least on the sale data corresponding to said at least one or more additional vendor computing devices;	response to a user initiated triggering event") **a performance indicator** (*e.g.*, parameter showing "sales channel's Room Type inventory is sold out"; parameter such as speed of sales in channel for inventory item(s) (indicating, *e.g.*, "day within the Rate Type active period is selling more quickly than other days in the period" or "might be selling out," etc.)) **in real time** (*e.g.*, based on most recent received data "pushed" from channels (*see* 1[g]); "rate management process may be repeated on a regular schedule… depending upon the needs of the Property")**, for each of the one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[d], [f])**, based at least on the sale data corresponding to said one or more additional vendor computing devices** (*e.g.*, all "Room Type inventory" or particular "Rate Type" of a particular company available on a "sales channel" (*e.g.*, "a sales channel's Room Type inventory is sold out or is selling better than other channels"; "a day within the Rate Type active period is selling more quickly than other days in the period"); *see* cl.1[g])**.** **Phillips discloses automatically/without the need for human intervention carrying out the revenue management process determining** (*e.g.*, "recommend actions based on sophisticated mathematical algorithms," "calculate[s]… booking limits," "software and analytical capabilities," "forecasts… based on current and recent bookings"), **including based on sale**

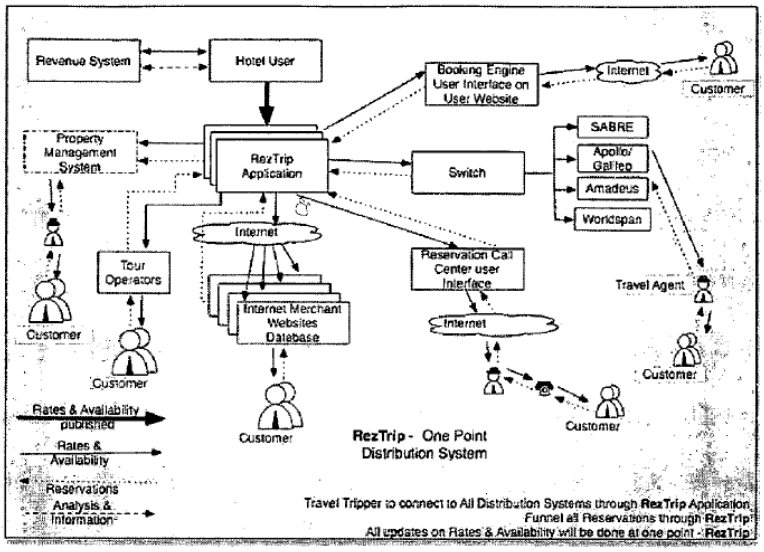
Property to lock inventory"). To the extent "determining" "automatically" or without human intervention is required, Jacob discloses this limitation or Jacob (in the recited combinations) in view of Phillips, Tamura, or Kono renders this limitation obvious. *See also* cl.1[pre].

	data (*e.g.*, "feed of bookings," "based on current and recent booking"), **a performance indicator in real time** (*e.g.*, "moment by moment" calculation of, *e.g.*, "return"; "a price-response function associated with each combination of product, market-segment, and channel… The price-response function specifies demand for the product of a single seller as a function of the price"; demand/"anticipated changes in demand" for a "seller"; "revenue per available seat mile, or RASM"). *See also* cl.1[pre], [i]. **Tamura discloses determining** (*e.g.*, mathematically analyzing) **a performance indicator** (*e.g.*, parameter (*e.g.*, "sales progress rate for each retailer of the items") indicating, *e.g.*, retailer has "low sales progress rate," "high sales progress rate") **for each of the one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d]) **based on at least the sale data corresponding to one or more additional vendor computing devices** (*e.g.*, "sales progress rate" of "group of merchandise among retailers and merchandise planning entities" with additional vendor computing device (*see* cl.1[a]) corresponding to additional "retailer" or additional "merchandise planning entities"; "with reference to the merchandise's distribution market"). **Kono discloses determining** (*e.g.*, "perform[ing] a sales analysis at each agency"; *see* cl.1[g]) **a performance indicator** (*e.g.*, "result" of "sales analysis at each agency") **for each of the one or more participant channels** (*see* cl.1[c]) **corresponding to the one or more active channel records** (*see* cl.1[d]).

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	"The system may further comprise a revenue management code segment. The ***revenue management code segment is used to analyze the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." EX1004, ¶[0010]. "Calculate the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." EX1004, ¶[0131]. "The PA monitors room inventory levels for the ***days in the Rate Type active period*** to identify the days that might be selling out soonest. If a ***day within the Rate Type active period*** is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." EX1004, ¶[0176]. "***If a sales channel's Room Type inventory is sold out or is selling better than other channels***, the PA might choose to ***reallocate inventory to the better-selling channel***. Alternatively, the PA may choose to close the

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	Rate Type/Room Type, for a given date or a series of dates, for certain channels." EX1004, ¶[0180]. "The ***rate management process may be repeated on a regular schedule***, such as twice daily, daily, twice weekly or weekly ***depending upon the needs of the Property***. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" EX1004, ¶[0185].  Figure 7 EX1004, Fig.7. "[e]very major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function[, and t]hese departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms." EX1029, 121.

	"[A]t the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***… Within a very short time (**typically less than 200 milliseconds**), the reservation system needs to send a message whether or not [a reservation] request can be accepted." EX1029, 136. "These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights.***" EX1029, 135. "In very rapidly changing environments such as the passenger airlines, the majority of prices will be ***updated automatically***, with analysts only investigating the unusual or unexpected situations." EX1029, 30. "a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity." EX1029, 106-107. "Successful ***pricing and revenue optimization*** involves two components…. The ***software and analytical capabilities required to support the process***. Much of the interest in pricing and revenue optimization has focused on its use of ***mathematical analysis***. ***Quantitative analysis*** is indeed critical in most pricing and revenue optimization settings, but it cannot provide

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	sustainable improvement unless it is ***embedded in the right process***." EX1029, 29. "Revenue management systems. The primary job of a revenue management system is to calculate and update the booking limits within the reservation system…The revenue management system receives a feed of bookings and cancellations from the reservations system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems." EX1029, 134-135. "The job of ***tactical revenue management*** is to ***calculate and periodically update booking limits***.". EX1029, 131. "Revenue management systems recommend booking limits for each product/fare class combination. Effective revenue management requires that these recommendations be continually monitored and reviewed. For example, Delta Airlines employs a group of more than 30 "revenue management analysts" who continually monitor the forecasts and booking limits generated by Delta's revenue management system." EX1029, 135. "Finally, a manufacturer may also be selling some cars directly to the public through a deal with an ***online channel***. In this case, the ***manufacturer needs to apply pricing and revenue optimization across the***

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	entire range of its channels and pricing mechanisms in order to maximize total profitability." EX1029, 29. "For a company with many ***products being sold through many channels, communicating the correct prices correctly*** can be a challenge in itself. A number of pricing execution or ***"pricing management" vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that complex pricing changes are correctly and efficiently transmitted through all channels***."; "we need to compare the results with our expectations and evaluate overall performance against our goal… Here, the ***effects of the most recent actions should be monitored so that immediate action can be taken if necessary***."; "***Price-response curves will be updated*** much more frequently, typically weekly or monthly in the case of markdown management or customized pricing." EX1029, Fig. 2.4, 31. "As we discuss in Chapter 3, the corporate goal in a ***product/segment/channel combination determines the form of the objective function*** that will be ***used when optimizing*** that "cell" of the PRO cube." EX1029, 32. "A fundamental input to any PRO analysis is the *price-response* function, or *price-response curve, d(p)* which specifies how demand for a product varies as a function of its price, *p.* There is ***one price-response function associated with each combination of product, market-segment, and channel.…*** The ***price-response function specifies demand for the product of a single seller as a function of the price*** offered by that seller." EX1029, 38-61.

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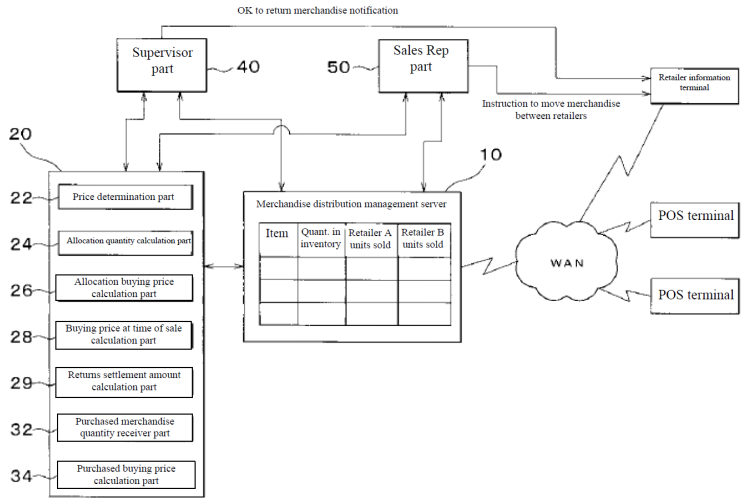
	"The range of costs…represents a channel-pricing opportunity …airlines and hotels can establish fare classes based on the channel of a booking request and determine whether or not to provide availability through that channel. Furthermore, it provides a tremendous economic incentive for revenue management companies to ***steer demand as much as possible through lower-cost channels... Calculation of incremental costs*** for a particular booking request requires an activity-based incremental costing model…" EX1029, 137-138. "at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted.***" EX1029, 126. "To get a better view of the revenue picture, ***airlines began to look at yield*** in addition to load factor. Yield is ***simply revenue per passenger mile***. Like load factor, it ***can be measured at any level*** from flight to market to entire airline. It was sometimes stated that the goal of managing bookings should be to increase yield—hence the term yield management, which was the original name for what is now more commonly called revenue management. Unfortunately, ***yield alone*** is a very ***imperfect metric*** since it ignores flight capacity. The strategy for increasing the yield from a flight is the exact opposite from that for increasing load factor—reject all early-booking demand and accept only late-booking high-yield passengers. This policy would maximize yield but would be disastrous for the airline,

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	since it would result in flights that were empty except for a few high-paying business passengers. What the airlines really needed was a metric that combined the capacity focus of load factor with the revenue focus of yield and recognized that the goal of revenue management is to maximize the return from resources. For an airline, these resources are seats, and the airline needs to maximize revenue from available seats. Since prices for products are at least somewhat proportional to distance, it helps to normalize by distance and to ***measure revenue per available seat mile, or RASM***. ***An airline that flies a 100-seat aircraft on an 1,800-mile flight (about the distance from Chicago to San Francisco) with a total revenue of $50,000 has just achieved an RASM of $50,000/(100 & 1,800) = $0.28 for that flight***." EX1029, 140-41. "The sales management system of the invention, for example, as shown in Fig 2, preferably further comprises ***a sales rep part 50 that manages the sales progress rate for each retailer of the items among a predetermined number of retailers based on the allocation quantity***; and the sales rep part 50 is authorized to transfer the items from retailers having a ***low sales progress relative to the allocation quantity to retailers having a high sales progress rate***." EX1005, ¶[0013]; Figs.2-3:

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Fig. 3



"The price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and ***with reference to the merchandise's distribution market***." EX1005, ¶[0019].

"The sales rep part 50 ***manages the sales progress rate for each retailer with respect to the items between a***

	predetermined number of retailers based on the allocation quantity. The sales rep part 50 has the authority to transfer items from a retailer with a low sales progress rate in relation to the allocation quantity to retailers with a high sales progress rate. A computer or information processing terminal connected to a communication line network may, for example be used. ***Sales reps (sales managers) who use the sales rep part 50 have a shared incentive to maximize sales within a group of merchandise among retailers and merchandise planning entities.*** For example, sales reps are assigned to a certain area by region, and if a certain product is not selling well at certain retailers within their area, they have the authority to transfer the merchandise to another retail store under their jurisdiction." EX1005, ¶[0035]. "The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate." EX1005, cl.4. "[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, ***the manufacturer server***

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	device is provided with: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; ***analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency***; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses. Moreover, the above configuration is further provided with: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and the ***sales index of each agency stored in the agency shipment information database*** and the sales index database, estimate the sales volume of the product on the overall market and ***performs a sales analysis at each agency***." EX1007, ¶[0009]. "According to the present invention having such characteristics, by connecting the manufacturer server device and the terminals of each agency by a direct network, the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each agency in real time. ***The manufacturer server device estimates the sales volume of the product on the overall market based on the acquired product shipment information***

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	of each agency and monthly sales index data of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, ***transfer (resale, etc.) of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed***." EX1007, ¶[0010]. "According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network, can acquire product shipment information from the agency to the retail store and product inventory information of the agency from each agency in real time. ***The maker estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and sales index of the product, and performs sales analyses at each agency.*** Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed. As a result, ***resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed***." EX1007, ¶[0014]. "Moreover, the maker-side server device 2 is configured be connected to the network N via an agency communication control computer 21, and in the device 2, connected to the agency communication control computer 21, a market inventory control computer 22, and a database server 23 by a LAN 24 or the like. Moreover, the market inventory control

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	computer 22 is provided with: acquisition means of acquiring product shipment information from the agency to the retail store and product inventory information of the agency from each agency terminal 1a, 1b, 1c, ...; ***analysis means for estimating sales volume of the product on the overall market and performs a sales analysis at each agency***; and ***transfer instruction means for, as a result of the sales analysis, for the product whose sales on the market have fallen, instructing transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instructing transfer between warehouses." EX1007, ¶[0025]. "FIG. 2 illustrates an example of various databases controlled by the database server 23. Three kinds of databases controlled by the database server 23 are prepared, that is, ***an agency inventory information database 23a, an agency sales (shipping) information database 23b***, and a sales index database 23c. Data of an agency code, a product number, and an inventory count are saved in the agency inventory information database 23a. Moreover, data of an agency code, an order source retail store code, a product number, the number of orders, an order date, and a shipping date are saved in the agency sales information database 23b. Moreover, ***monthly sales indexes of the previous year and current year are saved in the sales index database 23c***. In the database server 23, these data are updated daily so that ***the data can be stored and analyzed***. Moreover, in the present embodiment, these data can be analyzed by general purpose spreadsheet software." EX1007, ¶[0026].

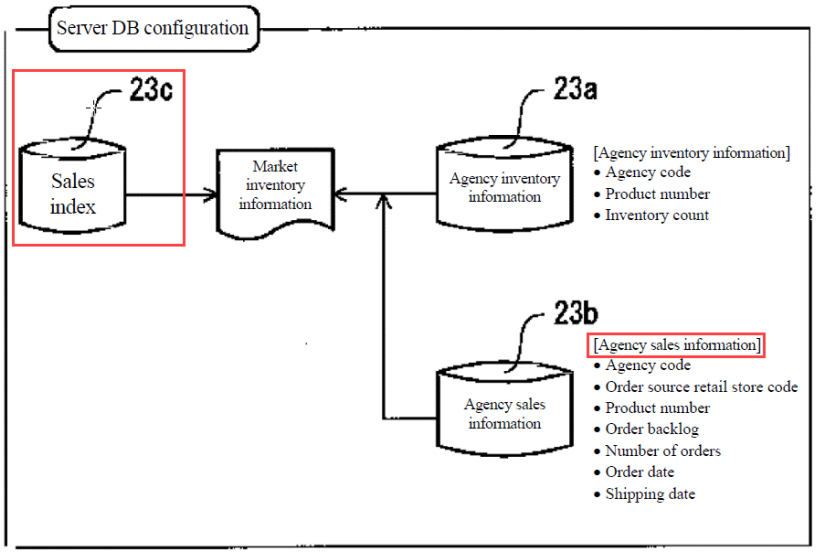
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	"Moreover, the monthly sales index is calculated as follows. That is, when the sales weight of all products included in the category to which the product belongs in the previous fiscal year (for example, the categories of bathroom supplies, kitchen supplies, buckets, cleaning supplies, ...)—for example, if the product belongs to the category of cleaning supplies, the sales weight of all products belonging to cleaning supplies from the agency to the retail store in the previous fiscal year—is as shown in Table 1 below, the monthly average sales weight is then 1,633 kg, and the value obtained by dividing the monthly results by the monthly average sales weight (average value) is the monthly sales index." EX1007, ¶[0030]. "In other words, the maker side does not receive returned products, and only a return fee is sufficient, and therefore costs are reduced, and wasteful production may be avoided. Moreover, on the agency "ffff" side, bad inventory can be accounted for. Inventory on the market can be controlled and effectively utilized in such a manner that at the agency "bbbb," necessary amounts can be secured and sales can be continuously secured as well. Moreover, because this ***type of information is periodically updated (daily)***, the inventory on the overall market can be always known, and it is possible to rapidly respond to this type of situation (***excess inventory and inventory shortage on the agency side***)." EX1007, ¶[0050]. "A market inventory control system in which an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication

	network and product inventory information of each agency is controlled by a manufacturer server device, wherein the manufacturer server device comprises: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; analysis means that estimate sales volume of the product on the overall market and ***performs a sales analysis at each agency; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells***, or in the case of the same agency, instruct transfer between warehouses." EX1007, cl.1. "The market inventory control system according to claim 1, further comprising: an agency shipment information database and an agency inventory information database that respectively store product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and ***the sales index of each agency stored in the agency shipment information database and the sales index database***, estimate the sales volume of the product on the overall market and performs a sales analysis at each agency." EX1007, cl.2.

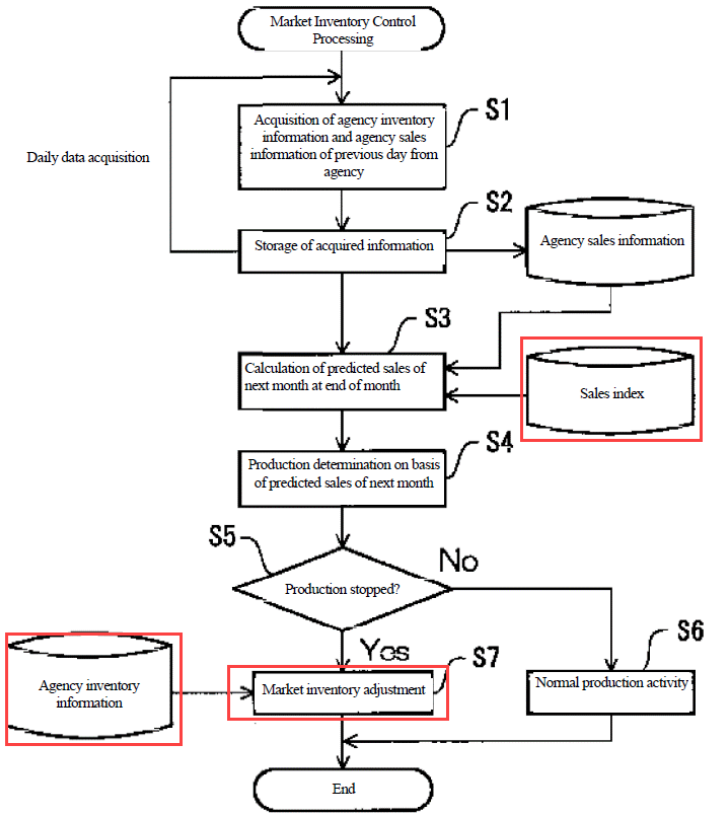
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[FIG. 2]



EX1007, Fig.2.

[FIG. 3]



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	EX1007, Fig.3.

POSITA would have understood Jacob's express disclosures of "perform[ing]" price calculations (including "automatically"/without human intervention) using, *e.g.*, code segments "to analyze the information received from the sales channels" (including information corresponding to additional vendor computing devices, *see* cl.1[g]), and receiving sale data relating to a sale price of each item (*e.g.*, EX1004, ¶¶[0006], [0010], [0131]-[0133]; cl.4 (*e.g.*, "reservation" or reservation "confirmation information" including "Rate Type" or "selling rate"), to apply to performing calculations as to ***prices*** (as discussed above) to determine, *e.g.*, "a day… is selling more quickly than other[s]" such that "date['s]" "price" should be "adjust[ed]" (*e.g.*, EX1004, ¶[0176] or a "Rate Type" "closed" (*e.g.*, EX1004, ¶[0180])—and "***inventory***"[23]—to determine, *e.g.*, remaining "Rooms Available," whether "a sales channel's" "inventory" is "selling out"/"sold out" (or—*see* cl.1[i]—"selling better than other channels")—and as requiring calculations of speed/current inventory. *E.g.*, EX1004, ¶[0180], Fig.41. Jacob further discloses the importance of keeping "information fresh at the sales channels," "insur[ing] [sic] that each sales channel would always be working with the most up-to-date pricing, availability and other information," and that inventory management systems should "quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time." *E.g.*, EX1004, ¶[0005]. Thus, **POSITA would have understood that Jacob (in the recited combinations) discloses determining (using both price and inventory data) a performance indicator in real time (from the most recent "pushed" data received (including, *e.g.*, in rapid succession) by Jacob's system** (*see* cl.1[g])**) for each of Jacob's participant channels based on at least sale data corresponding to at least one or more additional vendor computing devices** (*see* cl.1[g])**.** Alternatively, **POSITA would at minimum have**

[23] Jacob thus discloses or at minimum renders obvious the additional limitation added by claim 2, infra, which recites "the processing… comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per online distribution channel."

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recognized that in order to determine, *e.g.*, "a day within the Rate Type active period is selling more quickly than other[s]," such that prices should be "adjust[ed]," remaining "Rooms Available," and whether a sales channel's "inventory" is "selling out" or "sold out" (and enabling determining whether it "is selling better than other channels"), Jacob necessarily, and thus inherently, performs calculations as to both prices and inventory to determine a performance indicator (*e.g.*, a speed of inventory item sales in "the sales channels," *e.g.*, EX1004, ¶[0010]) in real time for each participant channel based on sale data corresponding to at least one or more additional vendor computing devices.

Even if, *arguendo*, "real time" required determining a performance indicator based on at least the sale data corresponding to one or more additional vendor computing devices relatively quickly/frequently, "real time" in the temporal sense (including using the most recent data pushed periodically over vanishingly short intervals) **would have been obvious based on Jacob (in the recited combinations).** POSITA would have understood determining a performance indicator for each sales channel in real time would ensure "fresh[er]" data (*e.g.*, EX1004, ¶[0185]) in situations with unexpectedly rapid sales or requests for re-pricing. For POSITA it would have been routine to make these implementation choices, and (again, particularly in light of the express disclosures of Jacob and the existence of other similar systems with extremely rapid processing/transmission) clear they would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1029 (discussing extremely rapid processing/transmission (*e.g.*, at 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information***

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instantaneously transmitted worldwide."), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a ***strong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity.")))).

Alternatively, if argued further disclosure of determining a performance indicator based on at least the sale data corresponding to one or more additional vendor computing devices in "real time" in the temporal sense is required, **this would have been obvious based on Jacob (in the recited combinations) in view of Phillips**. As discussed below, POSITA would have found it obvious to implement Jacob using Phillips's teachings of automatically determining a performance indicator. In addition, Phillips discloses "booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not" and that "within a very short time (typically less than 200 milliseconds) the reservation system needs to send a message whether or not [a reservation] request can be accepted." *E.g.*, EX1029, 136. Phillips further discloses that demand forecasts are "based on ***current and recent bookings***," (*e.g.*, EX1029, 135), and "the effects of most recent actions should be monitored so that immediate action can be taken if necessary," *e.g.*, EX1029, 31. And Jacob discloses the importance of keeping "information fresh at the sales channels," "insur[ing] [sic] that each sales channel would always be working with the most up-to-date pricing, availability and other information," and that inventory management systems should "quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time." *E.g.*, EX1004, ¶[0005]. Thus, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement the inventory management and distribution system of Jacob (in the recited combinations) using Phillips's beneficial teachings of determining a performance indicator in real time, in the temporal sense, if this were, *arguendo*, required.** Determining a performance indicator in real time, in the temporal sense, using sale data corresponding to the at least one or more additional vendor computing devices (*i.e.*, sale data corresponding to time-dependent

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inventory sold by multiple clients of Jacob's system running, *e.g.*, the "RezTrip" application) would have beneficially increased the ability and speed of the resulting system to monitor and track accurately the overall performance of each of Jacob's sales channels, including total inventory available at each sales channel and prices of inventory available at each sales channel, thereby permitting the system to more rapidly take into account data regarding the overall market when analyzing "the information received from the sales channels" to determine a performance indicator for each sales channel used to determine whether prices can be adjusted to "maximize revenue" and whether/if a particular sales channel is in danger of running out of inventory or if prices of inventory allocated to sales channels should be adjusted. This would have furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and ensuring that "each sales channel would always be working with the most up-to-date pricing, availability, and other information"/keeping "information fresh at the sales channels" by, *e.g.*, increasing the speed and efficiency of the system or user of the system in responding to changing market conditions by providing a "fresh" metric used to measure changing market conditions and based on which the system or user of the system could quickly and efficiently reallocate inventory or adjust prices. For POSITA it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1029 (discussing extremely rapid processing/transmission (*e.g.*, at 30 ("The operational PRO activities work ***continuously to set and update prices*** in the marketplace. The ***timing of the decisions will depend on the application—airline*** revenue management systems can change fares from ***moment to moment***."), 126 ("at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to send a message whether or not that request can be accepted***"), 7 ("E-commerce both necessitates and enables pricing and revenue optimization. The airlines pioneered electronic distribution—their computerized distribution systems, ***SABRE and Galileo,*** were the "Internet before the Internet." These systems allowed ***immediate receipt and processing of customer booking requests***. They also ***enabled airlines to change prices and availability and have the updated information instantaneously transmitted worldwide***."), 33 ("Much of the growing interest in pricing and revenue optimization is being driven by the ***increasing velocity of pricing decisions***. Where, in the past, prices changed once a quarter for any

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industries, now they change once a week, once a day, or even once an hour. Increased frequency and complexity of pricing within an industry creates its own momentum. A company that can change its prices more rapidly in response to changing market conditions will gain an advantage. This creates a s***trong incentive for other companies to match (or exceed) the frequency of change***. E-commerce has been a proven driver of increased price velocity.”))).

As discussed in 1[pre], Jacob in view of Phillips (in the recited combinations) renders obvious carrying out all of Jacob’s functions[24] (including, without limitation, determining a performance indicator) ***automatically/without human intervention*** (as Phillips describes). Further, making these determinations/comparisons ***by performing calculations*** (rather than, *e.g.*, relying on estimates or approximations) as to both prices and inventory would have advantageously increased the system’s ability to monitor and track accurately each channel’s revenue and inventory status. This would, in turn, have permitted the system to better and more quickly analyze whether prices/allocations should be adjusted to “maximize revenue” and whether a particular sales channel is in danger of running out of inventory or is out of inventory, and to compare and determine accurately whether a particular channel is selling inventory better than other channels. This would have furthered Jacob’s express goal of “maximiz[ing] revenue” of Jacob’s “time-dependent inventory” by, *e.g.*, increasing the efficiency of the system in responding to changing market conditions by adjusting prices and/or reallocating inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of inventory. For POSITA it would have been routine to make such an implementation choice, and (particularly in light of these disclosures) clear it would work and provide the expected functionality to yield predictable results with REOS.[25]

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[24] Although I have not repeated this discussion, this applies as well to the additional steps claimed in, *e.g.*, cl.1[a]-[g] and 1[i]. *See* cl.1[pre]. Further, this applies to claims 2 and 3.

[25] POSITA’s REOS here and for all of the obviousness arguments herein is further confirmed by this technology’s predictability. As discussed in my declaration

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To the extent it is argued further disclosure determining ***a performance indicator*** based on at least the sale data corresponding to one or more additional vendor computing devices is required, **this would have been obvious based on Jacob or Jacob-Phillips (in the recited combinations) in further view of Phillips (*see* cl.1[pre]-[g])**. For the reasons discussed in, *e.g.*, cl.1[pre], POSITA would have found it obvious to implement Jacob using Phillips's teachings of performing calculations (including, *e.g.*, price adjustments) automatically, and Phillips additionally discloses performing calculations on sale data (such as information from current and recent bookings) to obtain performance indicators for each channel, such as current price-response functions, demand/changes in demand, and revenue measures like RASM). In addition, **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's combined inventory management and distribution system (in the recited combinations, and including Jacob's disclosures of "performing calculations automatically" as to "inventory") using Phillips's beneficial teachings of determining a performance indicator automatically** to the extent it is argued Jacob or Jacob in light of the other aspects of Phillips does not already disclose or render obvious doing so. Performing calculations automatically to determine a performance indicator would have advantageously yielded a persistent indicator and increased the ability and speed of the resulting system to monitor and track accurately—without user intervention—inventory status and availability at each sales channel, thereby permitting the system to more rapidly determine/analyze how quickly a particular sales channel is selling inventory and whether it is running out of inventory, and more quickly compare/determine whether a particular channel is selling inventory better than other channels or at a higher price than other sales channels. This would have furthered both Jacob's and Phillips's express goals (*see* cl.1[pre]), and for POSITA (particularly in light of

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(§V), POSITA would have been well aware of all the hardware and software used in the combinations discussed herein, and "[s]ophisticated revenue-management systems" that, *e.g.*, "apply an inventory-allocation algorithm to make the best allocation decisions" were well known in the art. *E.g.*, EX1026, 2; EX1029, 101 (explaining that seller facing projected demand exceeding supply "could use a combination of allocations and price rises to manage the shortage"), 141 ("Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function. These departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms").

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these disclosures and other known, similar systems automatically performing calculations of performance predictions) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1029, 134-35, 30, 126; EX1026, 4 ("A reasonable proposition is that it is most beneficial for hotels to book reservations through the least-expensive channels, if there is sufficient demand via those channels. To manage revenue by distribution channel, revenue-management forecasting and optimization models must be revised to consider the relevant information.").

To the extent it is argued further disclosure of determining a performance indicator for each of the one or more participant channels based at least on the sale data corresponding to one or more additional vendor computing devices is required, **this would have been obvious based on Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura.** Both Jacob and Tamura describe inventory management systems using data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; *see also* cl.1[pre] (discussing Phillips). As discussed above, POSITA would have understood that Jacob discloses performing calculations as to both prices and inventory, and in any case, Jacob in view of Phillips (in the recited combinations) renders it obvious (*see supra* & 1[pre]). Tamura explicitly discloses receiving and processing sale data by carrying out calculations (which POSITA would have understood to be mathematically analyzing Tamura's sale data) to determine a performance indicator. *E.g.*, EX1005, ¶¶[0013], [0035], cls.4-5, Figs.2-3. For example, Tamura discloses "recording the inventory and the number of units sold during the unit period for each item of merchandise for sale," (EX1005, ¶¶[0014], [0017], [0019], [0024], [0025] cl.5, Fig.2) and automatically carrying out calculations (*e.g.*, comparing "number of units sold to allocated quantity" (*e.g.*, "based on the allocated quantity")) to determine a performance indicator (*e.g.*, indicating "low sales progress rate," "high sales progress rate). *E.g.*, EX1005, ¶¶[0013], [0035], cl.4. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's or Jacob-Phillips's combined inventory management and distribution system (in the recited combinations, and including Jacob's disclosures of "performing**

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calculations automatically" as to "inventory") using Tamura's beneficial teachings of processing sale data by automatically carrying out calculations to determine a performance indicator to the extent it is argued Jacob or Jacob-Phillips does not already disclose or render obvious doing so. Performing calculations automatically to determine a performance indicator (*e.g.*, "progress rate") would have advantageously yielded a persistent indicator and increased the ability and speed of the resulting system to monitor and track accurately—without user intervention—inventory status and availability at each sales channel, thereby permitting the system to more rapidly determine/analyze how quickly a particular sales channel is selling inventory and whether it is running out of inventory, and more quickly compare/determine whether a particular channel is selling inventory better than other channels or at a higher price than other sales channels. This would have furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, increasing the efficiency of the system in responding quickly to changing market conditions by providing a metric used to measure changing market conditions and based on which the system could quickly and efficiently reallocate inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of inventory or to channels that are selling inventory at higher prices and change prices. *See also* cl.1[pre] (discussing Phillips's express goals). For POSITA (particularly in light of these disclosures and other known, similar systems automatically performing calculations of performance predictions) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1029, 134-35, 30, 126; EX1026, 4 ("A reasonable proposition is that it is most beneficial for hotels to book reservations through the least-expensive channels, if there is sufficient demand via those channels. To manage revenue by distribution channel, revenue-management forecasting and optimization models must be revised to consider the relevant information.").

Alternatively, to the extent it is argued still further disclosure of processing the sale data by carrying out calculations to determine a performance indicator (including automatically/without human intervention) is required, **this would have been obvious over Jacob or Jacob-Phillips (in the recited combinations) in view of Kono**. As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution

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channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"); *see also* cl.1[pre] (discussing Phillips). As discussed above, Jacob further discloses "performing calculations automatically" as to "prices" (*e.g.*, EX1004, ¶¶[0131]-[0133]), and POSITA would have understood from these disclosures that Jacob also discloses automatically performing calculations as to "inventory," and in any case, Jacob in view of Phillips (in the recited combinations) renders it obvious (*see supra* & 1[pre]). Kono expressly discloses receiving sale data from each distribution channel (*e.g.*, EX1007, ¶¶[0009], [0010], [0014]), and automatically processing the received sale data by carrying out calculations (*e.g.*, "sales analysis at each agency," *e.g.*, EX1007, ¶¶[0009], [0010], [0014], [0025], cl.1) to determine a performance indicator (*e.g.*, "result" of the "sales analysis at each agency," *e.g.*, EX1007, ¶¶[0010], [0014], [0025], cl.1). **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's or Jacob-Phillips's combined inventory management and distribution system (in the recited combinations, including Jacob's disclosures of "performing calculations automatically" as to "inventory") using Kono's beneficial teachings of processing sale data by automatically carrying out calculations to determine a performance indicator** to the extent it is argued Jacob or Jacob-Phillips does not already disclose or render obvious doing so. Performing calculations automatically to determine a performance indicator (*i.e.*, "result" of "sales analysis at each agency") would have advantageously yielded a persistent indicator and increased the ability and speed of the resulting system to monitor and track accurately—without user intervention—inventory status and availability at each sales channel (including across multiple products sold by different vendors (*e.g.*, additional "merchandise planning entities") within each channel, thus enabling updating of pricing information and/or inventory allocations based on the overall market rather than the market for a single vendor's inventory items), thereby permitting the system to more rapidly determine/analyze how quickly a particular sales channel is selling inventory and whether it is running out of inventory, and more quickly compare/determine whether a particular channel is selling inventory better than other channels. This would have furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of

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each agency" and reducing "unnecessary inventory on the market" by, *e.g.*, increasing the efficiency of the system in responding quickly to changing market conditions by providing a metric used to measure changing market conditions and based on which the system could quickly and efficiently reallocate inventory from sales channel(s) with excess inventory to channels that are selling better or are in danger of running out of inventory and change prices. *See also* cl.1[pre] (discussing Phillips's goals). For POSITA (particularly in light of these disclosures and other known, similar systems automatically performing calculations of performance predictions) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See, e.g.*, EX1029, 134-35, 30, 126; EX1026, 4 ("A reasonable proposition is that it is most beneficial for hotels to book reservations through the least-expensive channels, if there is sufficient demand via those channels. To manage revenue by distribution channel, revenue-management forecasting and optimization models must be revised to consider the relevant information.").

1[i] and for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, adjusting,[26] via the channel interface, a price of the transportation service	**Jacob discloses for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[c]-[d], [f])**, adjusting** (*e.g.*, "close the Rate Type… for a given date or a series of dates, for certain channels"; "adjusting prices in response to changes in room inventory"; "price of an unreserved room may be lowered")**, via the channel interface** (*see* cl.1[a])**, a price of the transportation service** (*e.g.*, "Rate Type… for a given date or a series of

[26] '047 does not require that steps such as "adjusting" be performed "automatically" or without any human intervention. Rather, '047 expressly contemplates user input to its system. EX1001, 5:11-14, 30:59-31:3 ("interface used by vendor"), 31:54-60 ("interface to permit the Property to lock inventory"). To the extent "adjusting" "automatically" without any human intervention is required, as discussed below, Jacob discloses or Jacob-Phillips (*see* cl.1[pre]) renders obvious this limitation or Jacob or Jacob-Phillips in view of Tamura renders obvious this limitation. *See also* cl.1[h].

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by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold.	dates"; "price"; "selling rate" of inventory related to "the vendor computing device" (*see* cl.1[a])) **by an adjustment factor** (*e.g.*, "discounted rates"; "special discounts"; "[p]romotional discounts"; "promotion rate"; "promotion Rate Type"; "absolute dollar amount"; "percentage off the rate for that Room Type"; "dollar amount off the rate for that Room Type") **if the performance indicator** (*see* cl.1[h]) **indicates a performance that fails to meet a performance threshold** (*e.g.*, performance comprising "unreserved room"; "vacant" room; "day within the Rate Type active period is" not "selling [as] quickly" as "other days in the period" as to inventory related to the "at least one or more additional vendor computing devices" (*see* cl.1[g]))**.** **Phillips discloses automatically/without the need for human intervention** (*see* cl.1[pre]) **adjusting the price of an inventory item up or down** (*e.g.*, "*forecasting module* generates and updates for all products/fare class combinations", "prices will be updated automatically," "periodically updat[ing] the prices and/or availabilities [seller] is offering," "[p]eriodically recalculat[ing] all booking limits based on total bookings and demand expected in each class," "revenue management [system]… to calculate and… update the booking limits")**.** **Tamura discloses for each of the one or more participant channels corresponding to the one or more active channel records** (*see* cl.1[c]-[d])**, adjusting** (*e.g.*, "determines the reference retail price for items sold based on the amount of inventory and the number of parts sold during the part period for each item sold" "with reference to the merchandise's

	distribution market”)**, via the channel interface** (*see* cl.1[a])**, a price** (*e.g.*, “price”) **if the performance indicator** (*see* cl.1[h]) **indicates a performance that fails to meet a performance threshold** (*e.g.*, “unfavorable” to “sales volume target” (*e.g.*, channel has a “low sales progress relative to the allocated quantity”))**.** “Hotel reservation systems have been previously described, for example in U.S. patent application publications 2002/0152100, 2003/0144867, 2004/0249684, and in U.S. Pat. Nos. 5,832,451 and 5,832,454 all of which are hereby incorporated herein by reference. In addition to a system that accepts reservations, administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace, pricing and repricing inventory as necessary based upon changes in availability, reservation date, weather, and other factors. ***The system should allow the administrator to change the pricing of all items based upon class, occupancy, discounts, package deals, preferred client, or any other factor affecting price, with a minimum of data entry by the staff.*** While current systems Support the marketing of package deals, administrators would benefit from a system that would allow consumers to define their own package deals, tailored to their individual preferences. The system should quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time. ***Such a system would insure that each sales channel would always be working with the most up-to-date pricing, availability, and other information.***” EX1004, ¶[0005].

	"***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an ***analysis code segment, a revenue enhancement code segment***, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware***. ***The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" EX1004, ¶[0006]. "The system comprises a pricing code segment configured to allow the property administrators to manage room pricing information. The pricing code segment comprises the pricing functions. The prior art pricing change process is illustrated in FIG. 4. A property administrator wishing to change rates for rooms must manage each room type, rate type, date, and constraint type combination individually. As the number of room types, rate types, dates, and constraints grow, the task of changing and/or managing the information grows geometrically. As illustrated in FIG. 5, embodiments of the invention define a matrix of relationships between room types, rate types, and room constraints. The pricing code segment functions by

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	basing room prices upon the price of a standard room offered at the best available rate (BAR). For example, a standard single occupancy room may be offered at a particular BAR. The hotel user then enters the rates of the other rooms as a function of the BAR. Double occupancy may command a rate of BAR plus an extra person charge, triple occupancy may command a rate of BAR plus 2 times the extra person charge. A deluxe room may be priced at 15% above BAR, or $50 above BAR, or some other figure based upon BAR. Prices based upon combinations of room type, occupancy, special discounts, group discounts, and preferred client pricing may be set. Once the matrix of the dependencies upon the BAR are set, the system can calculate the prices of the available rooms. The matrix of BAR dependencies needs only to be set once. Subsequent room pricing changes may be implemented by changing only BAR. The rest of the room prices and rates can be calculated automatically based upon the matrix of BAR dependencies. Individual room prices may be set manually, overriding prices calculated by the matrix of BAR dependencies. Once pricing changes have been implemented the results may be distributed through the communication code segment or code segments to the sales channels. By defining a matrix of relationships or hierarchies between room types, rate types, and constraints, embodiments of the invention allow PA's to modify one rate, for example the BAR rate of a standard room type, and have other rates (floating rates) automatically changed as illustrated in FIG. 6." EX1004, ¶[0008]. "As used herein a Function or Functions refer to computer algorithms or algorithmic routines which manipulate or process or store or operate upon data and/or interact with users. Code segments which

	manage data do so through their associated functions." EX1004, ¶[0078]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels. The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer software, computer hardware or combinations of computer hardware and software.*** Embodiments of the

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	invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." EX1004, ¶[0083]. "Promotional discounts from direct mail, website, or email campaigns." EX1004, ¶[0121]. "Each Room Type within the system will be entered with a default selling rate along with the inventory for each calendar date. However, the same rate may not be offered to everyone. In certain instances a discount may be offered to a group of EUs. Therefore, the code

	segment provides functionality to associate various Rate Types with each Room Type for a given date. For example, the rate for a standard room across a series of dates could be as follows:" Standard Room- Rate Type | 04/11/05 | 04/12/05 | 04/13/05 Default Rate | $139 | $159 | $199 AAA ™ Rate | $126 | $144 | $180 Government Rate | $130 | $150 | $190 Summer Package Rate | $100 | $100 | $100 EX1004, ¶[0123]; *see also* EX1004, ¶[0124]. "Calculate the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." EX1004, ¶[0131]. "Automatically recalculate prices for associated Room Types in response to changes in the BAR rate. The ***code segment may be configured to perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." EX1004, ¶[0132]. "Communicate the prices to a plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or communicate in response to a user initiated triggering event***, such as a mouse click." EX1004, ¶[0133].

	"***The Promotion Rate is a Rate Type a Property might create and offer for sale to improve the revenue stream of the property.*** These Rate Types can be set up with restrictions, for example, minimum length of stay and valid only on certain days of week. The promotion Rate Type can be set up to be available permanently or within a specific time frame. The Rate Type can use absolute dollar amounts for room prices or the prices can be floating based upon the BAR rate. This Rate Type will use the inventory that is associated with the BAR. Therefore, if the BAR for standard rooms has 100 rooms, and if 20 rooms are sold at BAR rate, then 80 rooms remain available to be sold at the BAR rate and at any of the promotional rates that are available for the dates." EX1004, ¶[0152]. "***The Promotion Rate with inventory allows the Property to sell only a portion of the rooms at the promotional rate.*** In this case the promotional Rate Type will have its own inventory. If for example, a "Winter Promotion Rate Type" is given an inventory of 20 rooms for the dates December 1 through December 20, any room sold with this Rate Type will not affect the BAR inventory and vice versa." EX1004, ¶[0153]. "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The

	PA uses the system to quickly change rates." EX1004, ¶[0176]. "***If a sales channel's Room Type inventory*** *is sold out or* ***is selling better than other channels***, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to ***close the Rate Type***/Room Type, for a given date or a series of dates, ***for certain channels***." EX1004, ¶[0180]. "The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" EX1004, ¶[0185]. "The communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions. Once the Rate Types, Room Types, and inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels. Other information communicated to the selling channels may comprise add-on information, package information, amenity information, and facility information. ***The information is communicated to the selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for***

	example by a mouse click. As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such as the internet*** or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form." EX1004, ¶[0191]. "The package creation code segment is configured to manage package creation data and package creation functions. Embodiments of the invention provide a way for the PA to create packages/specials/items that can be offered to Eus during the reservation workflow. For example, a Property may have discounted rates. These discounted rates are usually offered during low booking seasons to maintain occupancy levels. The following types of promotions are configurable by the embodiments of the invention:" EX1004, ¶[0224]. "Fixed Rate Promotions: $ per night for a specific room type for a given set of dates." EX1004, ¶[0225]. "Floating Value Promotions: These can be of three types." EX1004, ¶[0226]. "A percentage off the rate for that Room Type." EX1004, ¶[0227].

	"A dollar amount off the rate for that Room Type." EX1004, ¶[0228]. "The system of claim 1 further comprising a code segment configured to ***communicate pricing information and inventory information to a plurality of sales channels***." Jacob cl.5. "The system of claim 5 further comprising a code segment to ***automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***." Jacob cl.6. "***A method of managing hotel pricing and inventory information comprising***: providing a database configured to manage hotel data; providing a first code segment configured to manage hotel data; providing a second code segment configured to manage user interaction; interacting with the code segments by: (a) entering portal data; (b) entering property data; (c) entering room type data; (d) entering room hierarchy data; (e) entering rate type data; (f) entering date data; (g) communicating pricing and inventory information to a plurality of sales channels. ***(h) monitoring room inventory***; ***(i) adjusting prices in response to changes in room inventory***; (j) adjusting prices in response to date changes; ***(k) communicating pricing and inventory information to a plurality of sales channels***; (l) repeating steps (i) through (l) on a regular schedule." EX1004, cl.13.

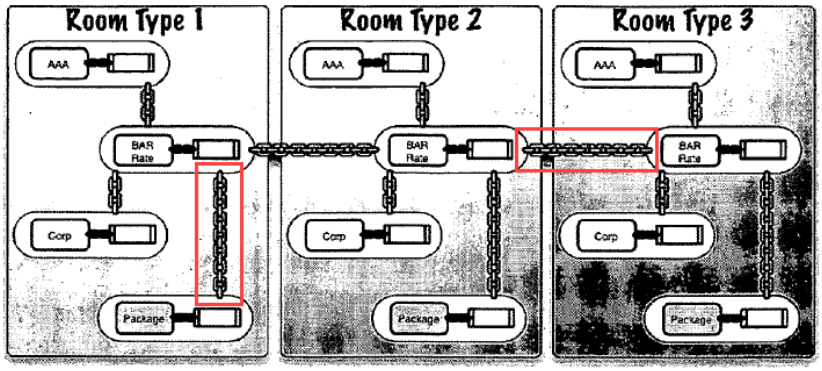


Figure 5

EX1004, Fig.5.

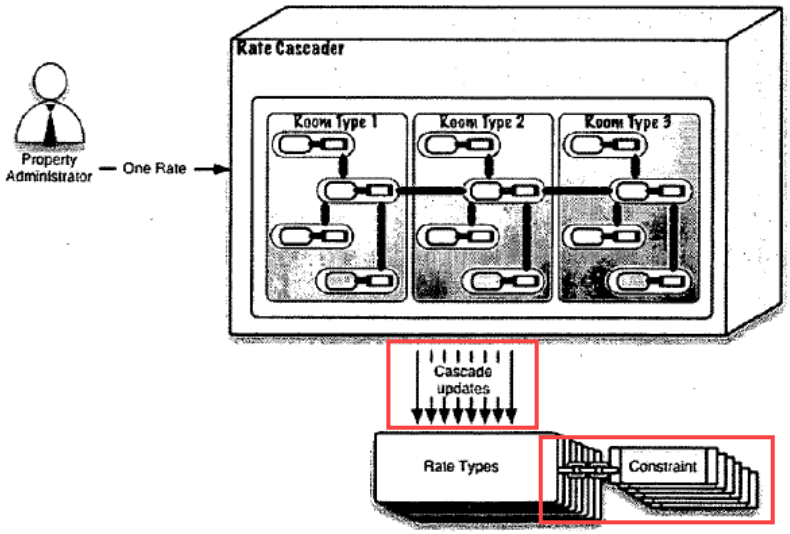


Figure 6

EX1004, Fig.6.[27]

[27] Jacob figures 5-6 are cited for obviousness.

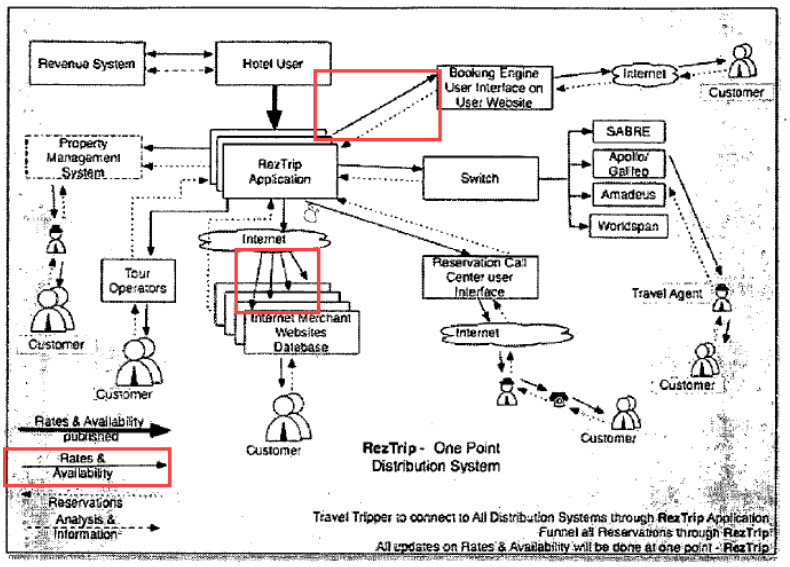


Figure 7

EX1004, Fig.7.

"In very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations." EX1029, 30.

"The *forecasting module* generates and updates for all products/fare class combinations for all future dates… These ***forecasts*** [of demand] are ***based on current and recent bookings for this flight***, historic booking performance for this flight, and ***general demand trends for all flights.***" EX1029, 134-135.

"at the heart of these systems are the ***booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not***."; "Within a ***very short time (typically less than 200 milliseconds), the reservation system needs to***

	send a message whether or not that request can be accepted." EX1029, 126. "For ***airlines, hotels, rental car companies, and cruise lines, booking control is a function of the reservation system. Tactical revenue management is the "brains"*** of the process. It is where ***future demand is forecast, optimization algorithms run, and booking limits set and updated***. We first discuss the strategy of revenue management and how it applies in different industries. We then turn to a somewhat detailed discussion of ***booking control—the "real-time" face of revenue management***."; "Once products and prices have been established, **revenue management tactics require setting and updating limits on how much of a particular product can be sold at a particular fare to each segment for some period of time**—say, a day or a week. ***Booking control* is the moment-to-moment determination of which booking requests should be accepted and which should be rejected**." EX1029, 123 (italics in this last quote are original). "The job of ***tactical revenue management*** is to ***calculate and periodically update booking limits***. These booking limits are transmitted to the reservation system, which then uses them to determine which booking requests to accept and which to reject based on the logic described in Section 6.5. To introduce the tactical revenue management problem in its most general form, it is useful to define resources, products, and fare classes. • Resources are units of capacity managed by a supplier. Examples of resources are a flight departure, a hotel room night, and a rental car day. Each resource is constrained—the flight departure has a limited number of seats, the hotel only has a limited number of rooms it can sell, and a rental car

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	company has only so many cars it can rent out on a particular day. • Products are what customers seek to purchase. A product may require use of one or more resources. A seat on Flight 130 from St. Louis to Cleveland on Monday, June 30, is a product that uses only a single resource. A two-night stay at the Sheraton Cleveland for a customer arriving on March 19 and departing on March 19 is a product that uses two resources: a room night on March 19 and a room night on March 20. There are one or more ***fare classes*** associated with each product. ***Each fare class is a combination of a price and a set of restrictions on who can purchase*** the product and when. As discussed in Section 6.3, different fare classes can be used to establish different virtual products, for group pricing, for regional pricing, or for combinations of all of these." EX1029, 131. "the company needs to determine ***how many units to sell at the lower price(s) and how many to reserve for sale at a higher price***." EX1029, 133. "6.6.2 Revenue Management Systems[:] The primary job of a revenue management system is to ***calculate and update the booking limits within the reservation system.*** Typically a revenue management system is separate from the reservation system but linked to it, as shown in Figure 6.3. The revenue management system receives a feed of bookings and cancellations from the reservation system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems." EX1029, 134.

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	"the tactic of ***variable pricing***… is ***used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***." EX1029, 99. "a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity." EX1029, 106-107. "***Passenger airlines*** certainly meet the criteria for ***variable pricing***—constrained capacity with demand that fluctuates over time. ***Southwest Airlines implements variable pricing directly by changing fares for their departures in order to match demand with the restricted capacity***. However, the major "***nondiscount" airlines also practice variable pricing. They do so by opening and closing the availability of various fare classes on different flights***.… In this case, the airline is adjusting the average fare not by changing the list price but by opening and closing fare classes. When total demand is anticipated to be high, the airline will restrict availability of discount fares, causing the average fare to increase. When total demand is anticipated to be low, the airline will open availability of deep discounts, causing the average fare to drop. It is continually monitoring demand using its revenue management system to determine which classes to open and close on each flight. We describe how this is done in some detail in Chapters 6 and 7. [¶] Discount airlines use variable pricing even more directly. ***If demand at Southwest Airlines begins to rise more quickly or more slowly than anticipated, Southwest may change the price***. Southwest does not attempt to

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	use prices to segment customers between "high-elasticity" and "low-elasticity" segments—rather, it is using variable pricing without segmentation to maximize the return from each flight and, to some extent, to smooth demand through demand diversion from high-fare/high-utilization flights to low-fare/low-utilization flights." EX1029, 112-113. "the techniques can be ***applied to any situation in which a seller needs to determine how to allocate a fixed supply among different channels or customer segments paying different prices.***" EX1029, 120. "4.3.2 Channel Pricing[:] ***Channel pricing is the practice of selling the same product for different prices through different distribution channels***. Here are some examples. • Barnes and Noble sells books for different prices online than through its outlets. • Special "Web-only" fares for airline tickets are available through the Internet but not through travel agencies. • Many fashion and home furnishing merchants offer lower prices for merchandise through mail-order catalogs than for the same merchandise sold through retail outlets. [¶] As with other price differentiation schemes, there can be more than one reason why a seller might charge different prices through different channels. One is cost—for many companies, selling through the Internet is cheaper than selling through traditional channels. Continental Airlines calculated that distribution costs for a $325 ticket are about $43 when the ticket is sold through a travel agent versus only $18 when the same ticket is sold through Continental's Web site. This difference in itself would be sufficient reason for Continental to charge lower prices on its Web site." EX1029, 79.

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	"However, it is also the case that ***customers arriving via different channels have different price sensitivities***. For personal loans, it has been shown that *customers inquiring through the Internet* are more price sensitive than those contacting a call center, who are in turn more price sensitive than those who apply for a loan at a retail branch. Furthermore, ***Internet customers who access a consolidator Web site or use a shopping 'bot tend to be more price sensitive than those who go directly to a bank's Web site***. This is not surprising given the characteristics of the channels—it is generally easier and more convenient to shop and compare prices during a single Internet session than by making many phone calls. Thus differential willingness to pay is also a motivation for channel pricing." EX1029, 80. "**Airlines are also enthusiastic channel pricers**; ticket prices on the Internet are often cheaper than through travel agents. Other revenue management companies followed the airlines in segmenting their market, creating virtual products and establishing a wide range of prices. **Hotels and rental car companies** establish and manage products and different prices oriented toward various groups: corporate, leisure, and business segments." EX1029, 124. "the seller could use a ***combination of allocations and price rises to manage the shortage.***" EX1029, 101. "A number of pricing execution or 'pricing management' vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that

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	complex pricing changes are correctly and efficiently transmitted through all channels." EX1029, 31. "The four most important global distribution systems are AMADEUS, Galileo, SABRE and Worldspan.[] Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines." EX1029, 126. "Channel pricing is the practice of selling the same product for different prices through different distribution channels…. Thus differential willingness to pay is also a motivation for channel pricing." EX1029, 120. "The goal of pricing and revenue optimization is to provide the right price • for every product • to every customer segment • through every channel and to update those prices over time in response to changing market conditions." EX1029, 26. "a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity." EX1029, 106-107 "A number of pricing execution or 'pricing management' vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that

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	complex pricing changes are correctly and efficiently transmitted through all channels." EX1029, 31. "***Periodically recalculate all booking limits based on total bookings and demand expected in each class*** until departure. (This recalculation is often called a *reoptimization*.) This dynamic booking control process makes no assumption about the nature of the reoptimization approach being used or the frequency with which reoptimizations occur. And, in fact, there is considerable variation among companies in the optimization approaches used and the frequency and situations under which they are applied. ***There is a general belief that frequent reoptimization is important – particularly when demand is changing rapidly or departure is approaching and bookings and cancellations are being received at a high rate***. Often, the tradeoff is between using a more complex algorithm and reoptimizing less often and using a simpler algorithm and reoptimizing more often. These issues are the topics of ongoing research and are by no means settled." EX1029, 170 "All of the pricing tactics we have studied so far assume that buyers and sellers interact in the same basic fashion. The seller offers a stock of goods to different customer segments through different channels. Potential customers arrive, observe a price, and decide whether or not to purchase. **The seller needs to decide what price to offer for each product to each customer group through each channel. The seller monitors sales of his goods and periodically updates the prices and/or availabilities he is**

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	offering. This is the *list pricing* model….” (italics original). EX1029, 264. “The invention is provided with a price determination part 22 that ***determines the reference retail price for items sold based on the amount of inventory and the number of parts sold during the part period for each item sold*** which is stored in a merchandise distribution management server 10; an allocation calculation part 24 that calculates the allocation quantity of the items for each retailer; an allocation buying price calculation part 26 that calculates the allocation buying price for each retail outlet based on the allocation quantity of the items; a buying price at the time of sale calculation part 28 that calculates the stocking price of the sold item based on the reference retail price at this stage when the purchased items based on the allocation quantity are sold by each retailer; and a returned goods settlement amount calculation part 29 that calculates the returned goods settlement amount according to the unsold quantity and returned goods fee for the items purchased by each retailer based on the quantity allocated thereto.” EX1005, Means of Solving the Problems. “The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step***: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100); a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to

	calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." EX1005, ¶[0014]. "The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy***. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and ***with reference to the merchandise's distribution market***." EX1005, ¶[0019].

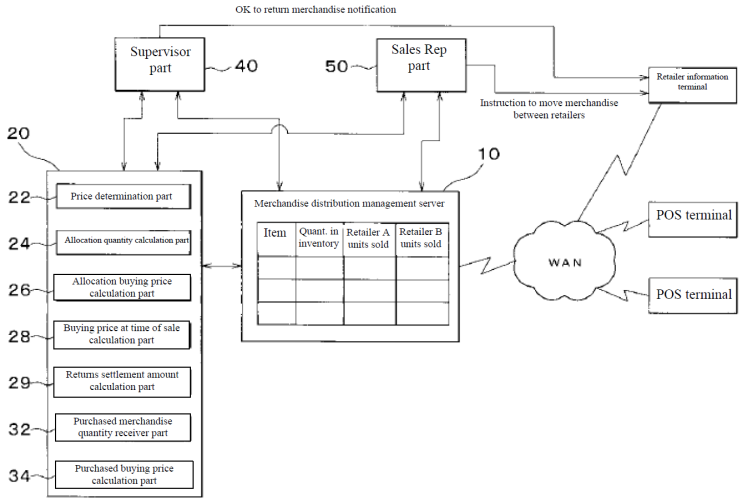
	"The allocated buying price calculation part 26 calculates the allocated buying price to each retailer based on the allocation quantity of the item in question calculated by the allocation quantity calculation part 24. The allocated buying price is the price that the retailer should pay to the merchandise entity for the allocated merchandise provided by the merchandise entity when buying the merchandise. ***The allocated buying price is based on the reference retail price in the price determination part 22, multiplied by a certain multiplying factor (e.g., 20% of the reference retail price)*** that covers procurement costs, such as the factory production price, plus logistics costs. The entity operating the retail store pays the allocated buying price to the merchandise planning entity within a certain period (e.g., within one month) from the time the goods are allocated and the allocated goods are delivered from the merchandise planning entity. From the perspective of the merchandise planning entity, the allocated buying price is in character a deposit for placing the allocated merchandise with the retailer." EX1005, ¶[0021]. "The purchase price calculation part 28 calculates the sold purchase price based on the reference retail price at the stage when the relevant item purchased based on the allocation quantity is sold by the retailers. ***The sold buying price is determined according to the buying prices for the retailers at the point of sale by multiplying a certain multiplying factor (e.g., 60% of the reference retail price) based on the reference retail price in the price determination part 22.*** The sold buying price is linked to the reference retail price, which is determined flexibly by the price determination part 22 and differs from the allocated buying price by the amount of the change between the reference retail

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price and the multiplying factor. Therefore, the retailer determines the purchase price of the allocated merchandise from the merchandise entity by multiplying the allocated merchandise from the merchandise entity by the sold purchase price." EX1005, ¶[0022].

"Next, the ***price determination part 22 sets a reference retail price based on the inventory quantity of the item in question and the number of units sold during the unit period*** as stored in the merchandise distribution management server 10 (S102). The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based on the allocation buying price and the allocation quantity of the item." EX1005, ¶[0025], Fig.3:

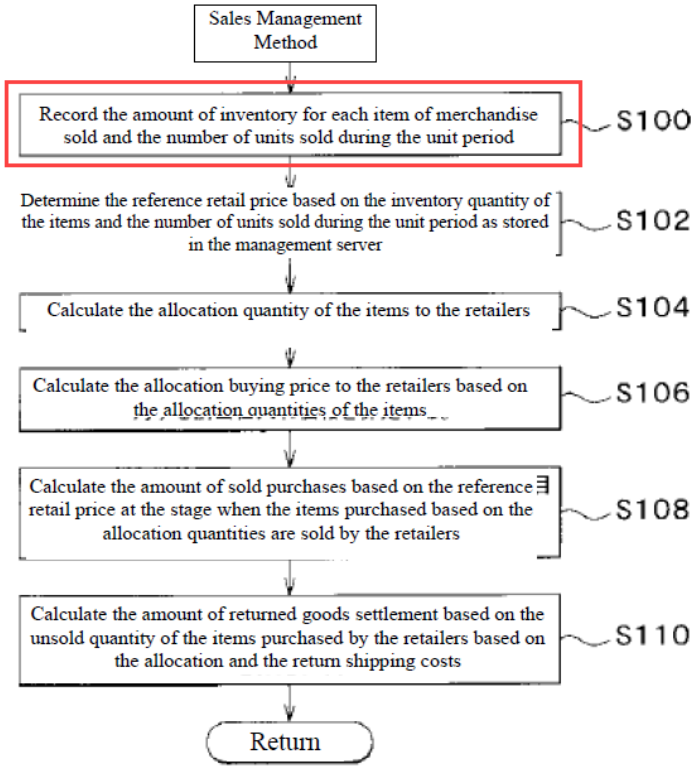
Fig. 3



	"A sales management system comprising: ***a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale***, which is stored in a merchandise distribution management server; an allocated quantity calculation part that calculates the allocated quantity of the items for each retailer; an allocated stocking price calculation part that calculates the allocated stocking price for each retailer based on the allocated quantity of the item calculated by the allocated quantity calculation part; a time of sale stocking price calculation part that calculates the stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and a returned goods settlement amount calculation part that calculates the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity." EX1005, cl.1. "The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate." EX1005, cl.4.

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Fig. 2



EX1005, Fig.2.

As Jacob expressly discloses, POSITA would have understood pricing and inventory information sent to Jacob's sales channels as a result of, *e.g.*, an automatically initiated triggering event (initiated by the system), to include ***updated*** pricing and inventory information that has been adjusted or modified as part of Jacob's expressly disclosed "rate management process" (by *e.g.*, Jacob's users, or Jacob's code segments, such as Jacob's revenue management, analysis, and revenue enhancement code segments). *E.g.*, EX1004, ¶[0185]. Jacob also discloses "computer program systems configured to manage the data and perform the methods/functions of the invention," including "code segments… configured to manage hotel data, and other time-dependent inventory data." *e.g.*, EX1004, ¶[0082]. Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose

computers." *E.g.*, EX1004, ¶¶[0082], [0083]. Additionally, Jacob discloses (in addition to the possibility of a human administrator providing input (*e.g.*, EX1004, ¶[0180])) that "information is communicated to the selling channels in response to a triggering event. A triggering event may [be] initiated automatically by the system upon completion of a pricing update" (EX1004, ¶[0191]) and "a code segment to automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event" (EX1004, cl.6). *See also* EX1004, ¶¶[0131]-[0133] ("code segment may be configured to automatically communicate the prices and/or communicate in response to a user initiated triggering event"), cl.31; cl.1[pre]. Jacob further discloses an "analysis code segment" and a "revenue enhancement code segment," (*e.g.*, EX1004, ¶[0006]), and a "revenue management code segment used to analyze the information received from the sales channels… to maximize hotel revenue," *e.g.*, EX1004, ¶[0010]. **POSITA would have understood these disclosures to be an express disclosure—as an alternative to actions triggered by human input—of automatically "adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold"** (*e.g.*, "unreserved" or "vacant" room(s), a "day within the Rate Type period is" not "selling [as] quickly" as "other days in the period," or a sale's channel's inventory is not selling as well as that of other sales channels (*see* cl.1[g])) and communicating such adjustments to both the system's clients (*e.g.*, Properties) to beneficially make clients aware of such adjustment as well as to the sales channels.

Further, if it is argued further disclosure is required, as discussed in 1[pre], Jacob in view of Phillips (in the recited combinations) renders obvious carrying out all of Jacob's functions[28] (including, without limitation, adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that fails to meet a performance threshold) ***automatically/without human intervention*** (as Phillips describes).

Additionally, POSITA would have further understood that Jacob provides examples of multiple sales channels, but that Jacob's disclosures would have applied to systems with two or more sales channels. And to POSITA, it would have been obvious from their understanding of basic economics (and optimization

[28] *See* n.22, *supra*.

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of net revenue) to upwardly "adjust" (*i.e.*, raise) a price or prices of items allocated to one or more distribution channels while also downwardly "adjusting" (*i.e.*, lowering) a price or prices of items allocated to one or more other distribution channels (known as "price differentiation") based on a performance indicator indicating a performance of a participant channel fails to meet a performance threshold. *See, e.g.*, EX1029, 1 ("Price differentiation is a ***powerful way for sellers to improve profitability***"), 74 ("The term price discrimination is used in the economics literature to refer to much the same thing. We use the term price differentiation"), 76 ("Charging every customer exactly her willingness to pay is known as third-degree price discrimination in the economics literature"), 6 ("Channel pricing is the practice of selling the same product for different prices through different distribution channels"), 15 ("Tactics for price differentiation include … ***channel pricing***…."), 26 ("The ***goal of pricing and revenue optimization is to provide the right price • for every product*** • to every customer segment • ***through every channel and to update those prices over time in response to changing market conditions***"), 74 ("price differentiation" is "one of the most fundamental concepts in PRO [pricing and revenue optimization]"), 78 ("***sellers have a tremendous incentive to find creative ways to position and price their products differently*** to different market segments"), 99 ("the tactic of ***variable pricing*** *...* ***is used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***."), 101 ("the ***seller could use a combination of allocations and price rises*** to manage the shortage"), 136-37 ("expected net contribution… is the price (fare) minus the incremental cost," which "may vary by channel"). This would have beneficially increased the ability of the resulting system to respond more fulsomely to changing market conditions by adjusting prices of items allocated to different channels in different directions (*i.e.*, one (or more) upwardly and one (or more) downwardly) (by, *e.g.*, communicating such pricing updates both to the system's clients and to sales channels), again increasing the system's ability to respond, thereby furthering Jacob's express goal of "maximiz[ing] revenue." For POSITA it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.[29]

[29] POSITA's REOS here and for all of the obviousness arguments herein is further confirmed by this technology's predictability. As discussed in §V of my declaration, POSITA would have been well aware of all the hardware and software

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To the extent it is argued that further disclosure of automatically "**adjusting**" by an adjustment factor based on the performance indicator indicating that a performance fails to meet a performance threshold is required, **it would have been obvious based Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura**. As discussed, both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"),

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used in the combinations discussed herein, and adjusting a price of items allocated to distribution channels automatically based on sale data was well-known in the art. *E.g.*, EX1011, 5:34-37 ("dynamically determine, adjust and manage product pricing"); EX1015, 2:15-22 ("adjusting the initial price… based on the actual sales of the product"); EX1029, 126 ("At the heart of these [existing reservation] systems [by which "airlines and other travel companies manage their inventory"] are the booking control mechanisms that determine moment by moment which fare classes are available for sale and which are not"), 30 ("In very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations."), 141 ("Every major airline, hotel, rental car company, or cruise line has a revenue management department or a revenue management function. These departments rely on computerized systems to recommend actions based on sophisticated mathematical algorithms"), 101 (explaining that seller facing projected demand exceeding supply "could use a combination of allocations and price rises to manage the shortage"; "if he has segmented his market effectively, he could raise his average selling price by allocating most or all of the limited supply to higher-paying customers"), 80 (explaining "that customers arriving via different channels have different price sensitivities… Thus differential willingness to pay is also a motivation for channel pricing"); EX1026, 2 ("One offers discounted rates to stimulate demand for inventory that would otherwise go unsold, but limits the availability of discounts to customers who are willing to pay a higher price…."; "Sophisticated revenue-management systems apply an inventory-allocation algorithm to make the best allocation decisions, which are then communicated to users in the form of restrictions on each rate-bucket level. Allocation decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions.").

[0041]. As also discussed, Jacob discloses "computer program systems configured to manage the data and perform the methods/functions of the invention" and "code segments form a code segment configured to manage hotel data, and other time-dependent inventory data." *E.g.*, EX1004, ¶[0082]; *see also* EX1004, ¶[0005] (update prices with "minimum of data entry by the staff"). Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose computers." *E.g.*, EX1004, ¶¶[0082], [0083]; *see also* EX1004, ¶¶[0131]-[0133], [0191]. Tamura expressly discloses "a merchandise distribution management server 10 that executes each step" (*e.g.*, EX1005, ¶[0014]), "a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale," and "announc[ing] to retailers… the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise," which POSITA would have understood is the sales progress rate, and "with reference to the merchandise's distribution market," which POSITA would have understood discloses adjusting based on sale data corresponding to at least one or more additional vendor computing devices (*see* cl.1[g]). *E.g.*, EX1005, cl.1; *see also* EX1005, ¶[0019] ("the price determination part 22 takes a strong attitude toward the reference retail price" or "takes a weak attitude toward the reference retail price or plans a sales promotion strategy"), [0025], Fig.3). **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob or Jacob-Phillips's inventory management and distribution system (in the recited combinations) (including Jacob's disclosure of "analyzing the information received from *the* sales channels," implementing discounted/promotional rates/taking a percentage off the rate for a particular room type, and storing such updated pricing information) using Tamura's beneficial teachings of automatically adjusting a price of items if performance fails to meet a performance threshold, such that in the resulting system the adjusting occurs automatically without the need for a user of the combined system to instruct the system to perform such adjustment and the updated price information is communicated to both the system's clients (*e.g.*, Properties) and the sales channels.** To the extent it is argued that automatically adjusting by an adjustment factor based on the performance indicator indicating that a performance fails to meet a performance threshold is required and is not disclosed by Jacob or rendered obvious by Jacob-

Phillips, this would have beneficially furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, reducing the response time/increasing the speed of the system (by reducing the need to wait for and address user intervention) and by increasing the ability of the system to take into account the result of processing sale data from multiple distribution channels in determining whether/how to adjust a price of items, thereby allowing the system to more quickly and effectively address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004, ¶[0002]; *see also* EX1004, ¶[0005] ("The system should allow the administrator to change the pricing of all items based upon…any… factor affecting price, with a minimum of data entry by the staff")). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See*, *e.g.*, EX1029[30] (discussing existing systems automatically adjusting price and channel allocations for inventory including transportation services – *e.g.* at 30 ("In very rapidly changing environments such as the passenger airlines, ***the majority of prices will be updated automatically***, with analysts only investigating the unusual or unexpected situations."), 123 ("For ***airlines, hotels, rental car companies, and cruise lines, booking control is a function of the reservation system. Tactical revenue management is the "brains"*** of the process. It is where ***future demand is forecast, optimization algorithms run, and booking limits set and updated***. We first discuss the strategy of revenue management and how it applies in different industries. We then turn to a somewhat detailed discussion of ***booking control—the "real-time" face of revenue management***."; "Once products and prices have been established, **revenue management tactics require setting and updating limits on how much of a particular product can be sold at a particular fare to each segment for some period of time**—say, a day or a week. ***Booking control* is the moment-to-moment determination of which booking requests should be accepted and which should be rejected**." (italics in this last quote are original)),

[30] To the extent it is argued that further disclosure of adjusting , via the channel interface, a price of the transportation service by an adjustment factor is required, this would have been obvious by the disclosures of Phillips (which is already part of the recited combinations) for the same reasons as those set forth above.

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131 ("The job of ***tactical revenue management*** is to ***calculate and periodically update booking limits***. These booking limits are transmitted to the reservation system, which then uses them to determine which booking requests to accept and which to reject based on the logic described in Section 6.5. To introduce the tactical revenue management problem in its most general form, it is useful to define resources, products, and fare classes. • Resources are units of capacity managed by a supplier. Examples of resources are a flight departure, a hotel room night, and a rental car day. Each resource is constrained—the flight departure has a limited number of seats, the hotel only has a limited number of rooms it can sell, and a rental car company has only so many cars it can rent out on a particular day. • Products are what customers seek to purchase. A product may require use of one or more resources. A seat on Flight 130 from St. Louis to Cleveland on Monday, June 30, is a product that uses only a single resource. A two-night stay at the Sheraton Cleveland for a customer arriving on March 19 and departing on March 21 is a product that uses two resources: a room night on March 19 and a room night on March 20. • There are one or more ***fare classes*** associated with each product. ***Each fare class is a combination of a price and a set of restrictions on who can purchase*** the product and when. As discussed in Section 6.3, different fare classes can be used to establish different virtual products, for group pricing, for regional pricing, or for combinations of all of these."), 133 ("the company needs to determine ***how many units to sell at the lower price(s) and how many to reserve for sale at a higher price***."), 134 ("6.6.2 Revenue Management Systems[:] The primary job of a revenue management system is to ***calculate and update the booking limits within the reservation system***. Typically a revenue management system is separate from the reservation system but linked to it, as shown in Figure 6.3. The revenue management system receives a feed of bookings and cancellations from the reservation system and, in turn, calculates booking limits that are transmitted periodically to the reservation system. The revenue management system will then send messages to update the booking limits in the global distribution systems."), 99 ("the tactic of ***variable pricing***… is ***used when a supplier has multiple units of constrained capacity and can change prices in order to balance supply and demand***."), 106-07 ("a seller with constrained capacity ***adjusts prices in response to anticipated changes in demand order to maximize return*** from fixed capacity"), 112-13 ("***Passenger airlines*** certainly meet the criteria for ***variable pricing***—constrained capacity with demand that fluctuates over time. ***Southwest Airlines implements variable pricing directly by changing fares for their departures in order to match demand with the restricted***

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capacity. However, the major "***nondiscount" airlines also practice variable pricing. They do so by opening and closing the availability of various fare classes on different flights***.… In this case, the airline is adjusting the average fare not by changing the list price but by opening and closing fare classes. When total demand is anticipated to be high, the airline will restrict availability of discount fares, causing the average fare to increase. When total demand is anticipated to be low, the airline will open availability of deep discounts, causing the average fare to drop. It is continually monitoring demand using its revenue management system to determine which classes to open and close on each flight. We describe how this is done in some detail in Chapters 6 and 7. [¶] Discount airlines use variable pricing even more directly. ***If demand at Southwest Airlines begins to rise more quickly or more slowly than anticipated, Southwest may change the price***. Southwest does not attempt to use prices to segment customers between "high-elasticity" and "low-elasticity" segments—rather, it is using variable pricing without segmentation to maximize the return from each flight and, to some extent, to smooth demand through demand diversion from high-fare/high-utilization flights to low-fare/low-utilization flights."), 120 ("the techniques can be ***applied to any situation in which a seller needs to determine how to allocate a fixed supply among different channels or customer segments paying different prices***"), 79 ("4.3.2 Channel Pricing[:] ***Channel pricing is the practice of selling the same product for different prices through different distribution channels***. Here are some examples. • Barnes and Noble sells books for different prices online than through its outlets. • Special "Web-only" fares for airline tickets are available through the Internet but not through travel agencies. • Many fashion and home furnishing merchants offer lower prices for merchandise through mail-order catalogs than for the same merchandise sold through retail outlets. [¶] As with other price differentiation schemes, there can be more than one reason why a seller might charge different prices through different channels. One is cost—for many companies, selling through the Internet is cheaper than selling through traditional channels. Continental Airlines calculated that distribution costs for a $325 ticket are about $43 when the ticket is sold through a travel agent versus only $18 when the same ticket is sold through Continental's Web site. This difference in itself would be sufficient reason for Continental to charge lower prices on its Web site."), 80 ("However, it is also the case that ***customers arriving via different channels have different price sensitivities***. For personal loans, it has been shown that *customers inquiring through the Internet* are more price sensitive than those contacting a call center, who are in turn more price sensitive than those who apply

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for a loan at a retail branch. Furthermore, ***Internet customers who access a consolidator Web site or use a shopping 'bot tend to be more price sensitive than those who go directly to a bank's Web site***. This is not surprising given the characteristics of the channels—it is generally easier and more convenient to shop and compare prices during a single Internet session than by making many phone calls. Thus differential willingness to pay is also a motivation for channel pricing."), 124 ("**Airlines are also enthusiastic channel pricers**; ticket prices on the Internet are often cheaper than through travel agents. Other revenue management companies followed the airlines in segmenting their market, creating virtual products and establishing a wide range of prices. **Hotels and rental car companies** establish and manage products and different prices oriented toward various groups: corporate, leisure, and business segments."), 101 ("the seller could use a ***combination of allocations and price rises to manage the shortage***"), 31 ("A number of pricing execution or 'pricing management' vendors, such as Vendavo and Metreo, sell software whose primary function is to ensure that complex pricing changes are correctly and efficiently transmitted through all channels"), 126 ("The four most important global distribution systems are AMADEUS, Galileo, SABRE and Worldspan.[] Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines"), 170 ("***Periodically recalculate all booking limits based on total bookings and demand expected in each class*** until departure. (This recalculation is often called a *reoptimization*.) This dynamic booking control process makes no assumption about the nature of the reoptimization approach being used or the frequency with which reoptimizations occur. And, in fact, there is considerable variation among companies in the optimization approaches used and the frequency and situations under which they are applied. ***There is a general belief that frequent reoptimization is important – particularly when demand is changing rapidly or departure is approaching and bookings and cancellations are being received at a high rate***. Often, the tradeoff is between using a more complex algorithm and reoptimizing less often and using a simpler algorithm and reoptimizing more often. These issues are the topics of ongoing research and are by no means settled."), 264 ("All of the pricing tactics we have studied so far assume that buyers and sellers interact in the same basic fashion. The seller offers a stock of goods to different customer segments through different channels. Potential customers arrive, observe a price, and decide whether or not to purchase. **The seller needs to decide what price to offer for each product to each customer group through each channel. The seller monitors**

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sales of his goods and periodically updates the prices and/or availabilities he is offering. This is the *list pricing* model…." (italics original)); EX1026, 2 ("One offers discounted rates to stimulate demand for inventory that would otherwise go unsold, but limits the availability of discounts to customers who are willing to pay a higher price…."; "Sophisticated revenue-management systems apply an inventory-allocation algorithm to make the best allocation decisions, which are then communicated to users in the form of restrictions on each rate-bucket level. Allocation decisions are typically updated nightly for the next 90 arrival days through a rerun of the inventory-allocation algorithm based on updated demand forecasts and overbooking decisions.").

In addition, Tamura expressly discloses two sales channels ("Retailer A" and "Retailer B"). As such, POSITA would have understood that although Jacob provides examples of multiple sales channels, the disclosures of the combined systems (including adjusting a price of inventory items would have applied to a system with two sales channels, in addition to a system with more.

As discussed above with respect to cls.1[g]-[h], Jacob or Jacob-Phillips (in the recited combinations) in view of Kono renders obvious receiving sale data for one or more participant channels (*see* cl.1[g]) corresponding to the one or more active channel records (*see* cl.1[d]). And as discussed immediately above, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura renders obvious automatically "**adjusting**" a price of the transportation service based on a performance that fails to meet a performance threshold. **It would have been obvious, straightforward, and advantageous to implement Jacob in view of Kono or Jacob-Phillips in view of Kono (in the recited combinations, including Jacob's code segments) using Tamura's additional teaching of automatically adjusting a price of inventory items based on a performance indicator indicating that a performance fails to meet a performance threshold. As discussed, both Tamura and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand.** *E.g.*, EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Implementing the combined system (including the recited Kono combinations) using Tamura's beneficial disclosure of automatically adjusting a price of inventory items based on

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a performance that fails to meet a performance threshold would have beneficially furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory," Tamura's express goals of "reducing lost sales opportunities," and Kono's express goal of reducing "unnecessary inventory on the market" by, *e.g.*, allowing the system to more quickly address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory (and communicating such adjustment to both the system's clients (*e.g.*, Properties) and the sales channels), thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004, ¶[0002]; *see also* EX1004, ¶[0005] ("minimum of data entry by the staff")) and "reducing lost sales opportunities" (EX1005, ¶[0001]). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See*, *e.g.*, EX1029[31] (discussing existing systems automatically adjusting price and channel allocations for inventory including transportation services); EX1026 (same for hotel inventory) (*see* citations in cl.1[i], immediately above).

[31] *See* n.30, *supra*.

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Claim 2

2 The computer-implemented method of claim 1, wherein the processing the sale data comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel.	**Jacob discloses processing the sale data** (*e.g.*, "analyz[ing] the information received from the sales channels"; *see* cl.1[g], [h]) **comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel** (*e.g.*, determining whether/"[i]f a sales channel's Room Type inventory is sold out"; determining "days that might be selling out soonest")**.** **Kono discloses processing the sale data** (*e.g.*, "sales analysis at each agency"; *see* cl.1[g], [h]) **comprises determining whether or not a supply of exceeds demand or vice versa per distribution channel** (*e.g.*, "check[ing] the sales of each agency" to determine if there exists a "backlog of orders" but "products are presently… out of stock"; determining "excess inventory and inventory shortage on the agency side"; determining "agencies having excess inventory"/"agencies having insufficient inventory")**.** "The system may further comprise a revenue management code segment. The ***revenue management code segment is used to analyze the information received from the sales channels***, information relating to client, date, length of stay, time of year, weekday vs. weekend, average occupancy and other factors to maximize hotel revenue." EX1004, ¶[0010]. "Calculate the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations automatically*** and/or perform calculations in response to a user initiated triggering event, such as a mouse click." EX1004, ¶[0131].

	"Automatically recalculate prices for associated Room Types in response to changes in the BAR rate. The ***code segment may be configured to perform calculations automatically*** and/or perform calculations in response to a user initiated triggering event, such as a mouse click." EX1004, ¶[0132]. "The PA monitors room inventory levels for the days in the Rate Type active period to identify the ***days that might be selling out soonest***. If a day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date. The PA may adjust prices in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." EX1004, ¶[0176]. "***If a sales channel's Room Type inventory is sold out*** or is selling better than other channels, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to close the Rate Type/Room Type, for a given date or a series of dates, for certain channels." EX1004, ¶[0180]. "A maker-side server device, the maker being a manufacturer, acquires product shipment information from an agency to a retail store and product inventory information of the agency from each agency (steps S1, S2), calculates a predicted sales volume for the next month based on the acquired product shipment

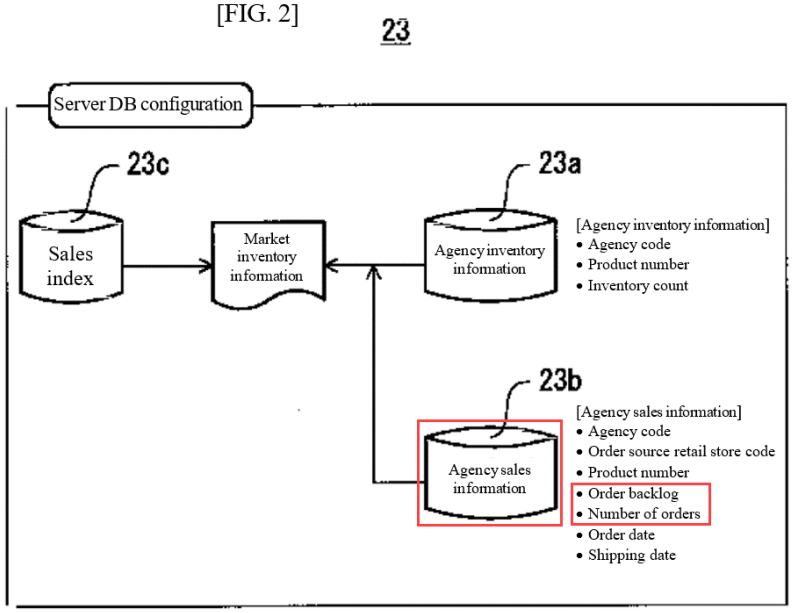
	information and product inventory information of each agency (step S3), and determines whether to produce or stop production on the basis of the calculated predicted sales volume for the next month (steps S4, S5) and the like. When, as a result, production is stopped, for the product whose sales on the market have fallen, ***inventory adjustment is performed on the market by instructing resale of the inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency***, instructing transfer between warehouses (step S7)." EX1007, Summary. "[Means for Solving Problem] To solve the above problems, in the market inventory control system of the present invention, wherein an agency terminal installed at each agency and a manufacturer server device installed at the manufacturer are connected via a communication network and product inventory information of each agency is controlled by a manufacturer server device, ***the manufacturer server device is provided with***: acquisition means that acquire product shipment information from the agency to a retail store and product inventory information of the agency from each agency terminal; ***analysis means that estimate sales volume of the product on the overall market and performs a sales analysis at each agency***; and transfer instruction means that, as a result of the sales analysis, for the product whose sales on the market have fallen, instruct transfer of inventory product from the agency where sales have fallen to the agency that still sells, or in the case of the same agency, instruct transfer between warehouses. Moreover, the above configuration is further provided with: an agency shipment information database and an agency inventory information database that respectively store

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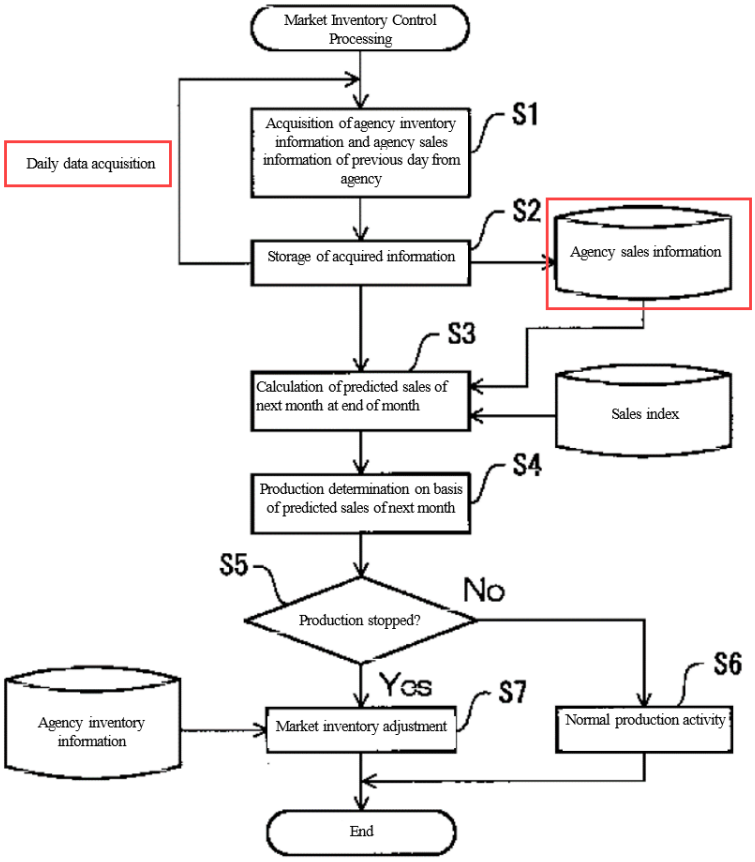
	product shipment information and product inventory information of each agency acquired from the acquisition means; and a sales index database that stores sales index data for each product; wherein the analysis means, based on the product shipment information and the ***sales index of each agency stored in the agency shipment information database*** and the sales index database, estimate the sales volume of the product on the overall market and ***performs a sales analysis at each agency***." EX1007, ¶[0009]. "According to the present invention having such characteristics, by connecting the manufacturer server device and the terminals of each agency by a direct network, the manufacturer server device can acquire product shipment information from the agency to the retail store and product inventory information of the agency from the agency terminals of each agency in real time. ***The manufacturer server device estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and monthly sales index data of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed.*** As a result, transfer (resale, etc.) of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." EX1007, ¶[0010]. "According to the present invention having such characteristics, the maker that is the manufacturer, by connecting to each agency by a direct network, can acquire product shipment information from the agency

	to the retail store and product inventory information of the agency from each agency in real time. ***The maker estimates the sales volume of the product on the overall market based on the acquired product shipment information of each agency and sales index of the product, and performs sales analyses at each agency. Moreover, the demand forecast of the overall market for the product and sales trends by region are analyzed.*** As a result, resale of the inventory product from the agency where sales have fallen to the agency that still sells, or transfer between warehouses in the case of the same agency is instructed." EX1007, ¶[0014]. In the previous steps S4 and S5, for example, production of a product having a product number "AAAAAAA" is stopped. ***The form illustrated in FIG. 4 shows the current inventory count, backlog of orders, and shipment count for the last month at agencies*** "aaaa to qqqq" that handle this product number "AAAAAAA." EX1007, ¶[0042]. "The maker-side server device 2 checks the sales of each agency by referring to the contents of this form. In the example illustrated in FIG. 4, at the agency "ffff" ***the shipping volume for the last month is 250, and the backlog of orders is 250, while the remaining inventory is more than enough at 2,500***. Since the production of product "AAAAAAA" has been stopped and a new substitute product is already scheduled to be introduced to the market, the product "AAAAAAA" will not be sold in the future. In this case, conventionally, products that are no longer necessary at the agency will be returned from the commercial practice of daily necessities, and the maker must pay

	the agency for the price of the return. On the other hand, at the agency "bbbb," ***the inventory count is 336, and the backlog of orders remaining is 2,390, and movement of products is still active, and products are presently still out of stock***." EX1007, ¶[0043]. "In other words, the maker side does not receive returned products, and only a return fee is sufficient, and therefore costs are reduced, and wasteful production may be avoided. Moreover, on the agency "ffff" side, bad inventory can be accounted for. Inventory on the market can be controlled and effectively utilized in such a manner that at the agency "bbbb," necessary amounts can be secured and sales can be continuously secured as well. Moreover, because this type of information is periodically updated (daily), the inventory on the overall market can be always known, and it is possible to rapidly respond to this type of situation (***excess inventory and inventory shortage on the agency side***)." EX1007, ¶[0050]. "Moreover, according to the market inventory control method of the present information, when transferring inventory product between agencies, a response is made by resale of the inventory product from the agency where sales have fallen to the agency that still sells, and only the distribution cost required for resale is borne by the manufacturer, and therefore, the manufacturer does not receive returned products, and only a return fee paid as a distribution fee is sufficient, and therefore costs are reduced, and wasteful production may be avoided. Moreover, inventory on the market can be controlled and effectively utilized in such a manner that at ***agencies having excess inventory, bad inventory can be accounted for, and at***

	agencies having insufficient inventory, necessary amounts can be secured and sales can be continuously secured as well." EX1007, ¶[0053]. [FIG. 2]  EX1007, Fig.2.

[FIG. 3]



EX1007, Fig.3.

[FIG. 4]

Good Class.	Product No.	Product Name	Agency Name	Inventory Count	Order Backlog	Shipping Volume	Inventory Date
KC0742	AAAAAA	Sorting pedal bin #40	aaaa	100	0	3	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	bbbb	336	2390	2351	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	cccc	560	20	15	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	dddd	365	1200	1350	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	eeee	10	10	10	8/21/2000
KC0742	AAAAAA	Sorting pedal bin #40	ffff	2500	250	250	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	gggg	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	hhhh	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	iiii	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	jjjj	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	kkkk	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	llll	9	5	10	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	mmmm	45	5	5	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	nnnn	0	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	oooo	9	3	20	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	pppp	5	0	0	8/22/2000
KC0742	AAAAAA	Sorting pedal bin #40	qqqq	96	20	85	8/22/2000

EX1007, Fig.4.

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Jacob expressly discloses the additional limitation of this claim. *E.g.*, EX1004, ¶[0180]. To the extent it is argued further disclosure of "determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel" is required, **it would have been obvious based on Jacob (*see* n.23) (in the recited combinations of claim 1) in view of Kono**. As discussed, both Jacob and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Kono expressly discloses that its system "checks the sales of each agency" to determine if there exists a "backlog of orders" but "products are presently… out of stock," determining "excess inventory and inventory shortage on the agency side," and determining "agencies having excess inventory" and "agencies having insufficient inventory." *E.g.*, EX1007, ¶¶[0042], [0043], [0050], [0053], Figs.2, 4. **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's inventory management and distribution system (in the recited combinations) using Kono's beneficial explicit teachings of determining whether or not inventory supply exceeds demand or vice versa per participant channel.** This would have beneficially and advantageously increased the ability of the resulting system to monitor and track accurately inventory status and availability at each sales channel, thereby permitting the system to determine and better analyze how quickly a particular sales channel is selling inventory, whether a particular sales channel is running out of inventory, and to compare and determine accurately whether a particular channel is selling inventory better than other channels (including by, *e.g.*, selling out). This would have furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory" and Kono's express goals of "effectively utiliz[ing] market inventory by collectively controlling the inventory control of each agency" and reducing "unnecessary inventory on the market." For POSITA it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

Claim 3

3 The computer-implemented method of claim 1, wherein the one or more active channel records are linked to the channel interface without the one or more inactive channel records.	**Jacob discloses active channel records are linked to the channel interface** (*see* cl.1[a], [d], [f])**.** **Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive** (*see* cl.1[e])**.** "**The goal of pricing and revenue optimization is to provide the right price,** • for every product • to every customer segment • **through every channel** and to update those prices over time in response to changing market conditions. The three dimensions of pricing and revenue optimization can be illustrated in a cube, as shown in Figure 2.4. Each element within the cube represents a combination of product, channel, and customer segment. Each element (or *cell*) has an associated price. For example, one element might be: *medium-size turbines sold to large customers in the northeast via the direct sales channel* Another element might be: *Replacement gears sold to small companies via online sales* In theory, each cell within the PRO cube could correspond to a different price. In practice, some cells may not be meaningful. **Some products may not be offered through some channels,** for example." EX1029, 26 (italics in this quote original).

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	"Global distribution systems provide a conduit connecting the reservation system and a number of important sales outlets-particularly travel agents. There are currently over 180,000 GDS terminals worldwide. Most of these terminals are placed with travel agents, but some are in the travel offices oflarge companies (Marvel 2004). The four most important global distribution systems are AMADEUS, Galileo, SABRE, and Worldspan…. Each GDS distributes schedule, fare, and booking availabilities to the agencies and transmits bookings and cancellations from the agencies to the airlines. Most airlines, major hotel chains, major rental car companies, and cruise lines have contracts with most or all of the global distribution systems allowing them to distribute and sell their products. There are exceptions: ***Both Southwest Airlines and JetBlue Airways subscribe only to SABRE and do not accept bookings through any other GDS*** (Kontzer 2004)." EX1029, 126. "In fact, ***it is not uncommon for individual sellers to be utilizing different approaches for different products through different channels***. For example, an automobile manufacturer is likely to sell the majority of vehicles through dealers, utilizing a combination of "shelf price" (in this case, the wholesale price) and promotions. However, Ford Motor Company receives about 9% of its revenue in North America from group sales of cars to corporate, government, and industrial fleets. These sales are generally priced through individual negotiations or bids. Finally, ***a manufacturer may also be selling <u>some</u> cars directly to the public through a deal with an online channel***. In this case, the manufacturer needs to apply pricing

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	and revenue optimization across the entire range of its channels and pricing mechanisms in order to maximize total profitability." EX1029, 29. "The range of costs shown in Figure 6.4 represents a channel-pricing opportunity. It also provides an expanded opportunity for revenue management—***airlines and hotels can establish fare classes based on the channel of a booking request and determine whether or not to provide availability through that channel.*** Furthermore, it provides a tremendous economic incentive for revenue management companies to steer demand as much as possible through lower-cost channels. While online travel has been booming, the global distribution systems still account for about 60% of bookings for a typical airline and about 68% for a typical hotel, leaving plenty of scope for future savings (Grossman 2004)." EX1029, 137-38. "Special ***"Web-only" fares for airline tickets are available through the Internet but not through travel agencies***." EX1029, 79. "For an airline or hotel, prices are updated by opening or closing fare classes—a process discussed in more detail in Chapter 6. In other cases, ***a "pricing matrix" database specifies which prices are available to which customers through which channels***." EX1029, 31.

As discussed, both Jacob and Phillips describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010],

[0154]; EX1029, 9, 30, 33, 121-122, 134-135, 141. In addition, Jacob expressly discloses active channel records are linked to the channel interface. *See* cl.1[a], [d], [f]. And Phillips discloses establishing one or more non-participant channels for a transportation service that are known to be inactive. *See* cl.1[c]. Based on these express disclosures, **POSITA would have found it obvious, straightforward, and advantageous to implement Jacob (in the recited combinations), including its disclosures of storage of "hotel data" comprising, *e.g.*, "sales channel data" and "inventory data," using Jacob's and Phillips's beneficial teachings of not selecting/de-selecting certain channels (discussed *supra*) to participate/from participating in selling Jacob's transportation services inventory such that the system (in the recited combinations) establishes, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service,** including by establishing channel records of non-participant channels with data reflecting that they are inactive, and not linking these inactive channel records to/omitting these inactive records from the channel interface. This would have, *e.g.*, beneficially allowed the system to differentiate simply and quickly between channels that are allocated inventory and are selling and those that are not, thereby increasing the efficiency and speed of the system's processing of information regarding the relative performance of active, selling channels, increasing the system's ability to track and monitor allocated inventory as well as to reprice/reallocate it, and enabling the system to more rapidly determine which additional sales channels are available to sell inventory should a price adjustment or additional sales channels become necessary (*e.g.*, if existing participant channels are not selling well or if they have a lower expected net contribution to revenue)—including by maintaining records of the inactive channels, but omitting those records from the channel interface for communication between the vendor computing device and the RezTrip computer/server unless and until they become active records (*e.g.*, if they are later selected by, *e.g.*, a Property's personnel (*see* cl.1[c]) to participate in selling Jacob's transportation services inventory) (thereby reducing complexity and increasing efficiency by, *e.g.*, reducing the number of channel records linked to the interface, avoiding unnecessary data transfer, saving bandwidth, and avoiding presentation of material to Property personnel that is not immediately pertinent). This would have furthered Jacob's express goals of "[m]aximizing rental revenues" and "maxim[izing] use of time-dependent inventory" by "tak[ing] advantage of many different sales channels," (*e.g.*, EX1004, ¶¶[0002], [0010], [0154] ("A property

does its bookings through various channels… in order to maximize occupancy rate and maximize room rate.")), and Phillips's express goal of, *e.g.*, "maximizing *expected net contribution*," which is "price (fare) minus incremental cost," consistent with Phillips's teaching that there is "tremendous economic incentive… to steer demand as much as possible through lower-cost channels."; EX1029, 136-138 (emphasis original). It would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.

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Claim 4

4[pre] A computer-implemented method of managing online bookings for transportation services inventory, the computer-implemented method comprising:	For example, see disclosures provided in relation to cl.1[pre], above.
4[a] establishing a channel interface that provides bidirectional communication between at least one server computing device and a vendor computing device;	For example, see disclosures provided in relation to cl.1[a], above.
4[b] storing, via a channel data structure, a channel record for each of a plurality of distribution channels;	For example, see disclosures provided in relation to cl.1[b], above.
4[c] receiving, from the vendor computing device through the channel interface, a selection, from the plurality of distribution channels, of one or more participant channels for a transportation service;	For example, see disclosures provided in relation to cl.1[c], above.
4[d] establishing, via the channel data	For example, see disclosures provided in relation to cl.1[d], above.

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structure, one or more active channel records based upon the one or more participant channels for the transportation service;	
4[e] establishing, via the channel data structure, one or more inactive channel records based upon one or more non-participant channels for the transportation service;	For example, see disclosures provided in relation to cl.1[e], above.
4[f] linking the one or more active channel records to the channel interface;	For example, see disclosures provided in relation to cl.1[f], above.
4[g] receiving, in real time for the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, sale data corresponding to at least one or more additional vendor computing devices;	For example, see disclosures provided in relation to cl.1[g], above.
4[h] determining a performance indicator in real time, for each of the one or more	For example, see disclosures provided in relation to cl.1[ha], above.

participant channels corresponding to the one or more active channel records linked to the channel interface, based at least on the sale data corresponding to said at least one or more additional vendor computing devices;	
4[i] and for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface, adjusting,[32] via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that meets a performance threshold.	**Jacob discloses for each of the one or more participant channels corresponding to the one or more active channel records linked to the channel interface** (*see* cl.1[c]-[d], [f])**, adjusting** (*see* cl.1[i])**, via the channel interface** (*see* cl.1[a], [i])**, a price of the transportation service** (*see* cl.1[a], [i]) **by an adjustment factor** ("close the Rate Type… for a given date or series of dates, for certain channels"; *see* cl.1[i]) **if the performance indicator** (*see* cl.1[h], [i]) **indicates a performance that meets a performance threshold** ("sales channel's Room Type inventory is sold out or is selling better than other channels"; "day within the Rate Type active period is selling more quickly"; "days that might be selling out soonest"; *see* cl.1[g], [i])**.** **Phillips discloses automatically/without the need for human intervention** (*see* cl.1[pre], [i]) **adjusting the price of an inventory item up or down** (*see* cl.1[i])**.** **Tamura discloses for each of the one or more participant channels corresponding to the one or**

[32] *See* n.22, 26; *see also* cl.1[h].

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	more active channel records (*see* cl.1[c]-[d], [i])**, adjusting** (*see* cl.1[i])**, via the channel interface** (*see* cl.1[a], [i])**, a price** (*see* cl.1[i]) **if the performance indicator** (*see* cl.1[h], [i]) **indicates a performance that meets a performance threshold** (*e.g.*, "favorable" to "sales volume target" (*e.g.*, channel has a "high" "sales progress relative to the allocated quantity"))**.** "Hotel reservation systems have been previously described, for example in U.S. patent application publications 2002/0152100, 2003/0144867, 2004/0249684, and in U.S. Pat. Nos. 5,832,451 and 5,832,454 all of which are hereby incorporated herein by reference. In addition to a system that accepts reservations, administrators require a sales and inventory management system that will allow them to respond quickly to the dynamic nature of the marketplace, pricing and repricing inventory as necessary based upon changes in availability, reservation date, weather, and other factors. ***The system should allow the administrator to change the pricing of all items based upon class, occupancy, discounts, package deals, preferred client, or any other factor affecting price, with a minimum of data entry by the staff.*** While current systems Support the marketing of package deals, administrators would benefit from a system that would allow consumers to define their own package deals, tailored to their individual preferences. The system should quickly distribute updated pricing information, availability information, and other information to the sales channels, preferably in real time. ***Such a system would insure that each sales channel would always be working with the most up-***

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	to-date pricing, availability, and other information." EX1004, ¶[0005]. "***Embodiments of the present invention are computer program systems comprised of a series of code segments***. The code segments may comprise an ***analysis code segment, a revenue enhancement code segment***, a pricing code segment, a portal code segment, a property code segment, a room type code segment, rate type code segment, rate grid code segment, add-on management code segment, engine customization code segment and at least one communications code segment. A schematic diagram of a system of the invention and its connection to sales channels is shown in FIG. 7. ***The code segments may be implemented in the form of computer software or computer hardware or a combination of computer software and hardware***. ***The code segments comprise a system to manage the sales, pricing, and inventory information related to time-dependent items, such as hotel rooms, rental automobiles, airline seats and associated items.***" EX1004, ¶[0006]. "The system comprises a pricing code segment configured to allow the property administrators to manage room pricing information. The pricing code segment comprises the pricing functions. The prior art pricing change process is illustrated in FIG. 4. A property administrator wishing to change rates for rooms must manage each room type, rate type, date, and constraint type combination individually. As the number of room types, rate types, dates, and constraints grow, the task of changing and/or managing the information grows geometrically. As illustrated in FIG. 5, embodiments of the invention define a matrix of

	relationships between room types, rate types, and room constraints. The pricing code segment functions by basing room prices upon the price of a standard room offered at the best available rate (BAR). For example, a standard single occupancy room may be offered at a particular BAR. The hotel user then enters the rates of the other rooms as a function of the BAR. Double occupancy may command a rate of BAR plus an extra person charge, triple occupancy may command a rate of BAR plus 2 times the extra person charge. A deluxe room may be priced at 15% above BAR, or $50 above BAR, or some other figure based upon BAR. Prices based upon combinations of room type, occupancy, special discounts, group discounts, and preferred client pricing may be set. Once the matrix of the dependencies upon the BAR are set, the system can calculate the prices of the available rooms. The matrix of BAR dependencies needs only to be set once. Subsequent room pricing changes may be implemented by changing only BAR. The rest of the room prices and rates can be calculated automatically based upon the matrix of BAR dependencies. Individual room prices may be set manually, overriding prices calculated by the matrix of BAR dependencies. Once pricing changes have been implemented the results may be distributed through the communication code segment or code segments to the sales channels. By defining a matrix of relationships or hierarchies between room types, rate types, and constraints, embodiments of the invention allow PA's to modify one rate, for example the BAR rate of a standard room type, and have other rates (floating rates) automatically changed as illustrated in FIG. 6." EX1004, ¶[0008]. "As used herein a Function or Functions refer to computer algorithms or algorithmic routines which

	manipulate or process or store or operate upon data and/or interact with users. Code segments which manage data do so through their associated functions." EX1004, ¶[0078]. "***Embodiments of the invention comprise computer program systems configured to manage the data and perform the methods/functions of the invention. The computer program systems are comprised of code segments, each code segment being configured to perform certain methods and/or functions of the invention. When combined, the code segments form a code segment configured to manage hotel data, and other time-dependent inventory data.*** Such code segments may comprise a pricing code segment configured to manage pricing data, a portal code segment configured to manage portal data, a property code segment configured to manage property data, a room type code segment configured to manage room type data, a room type hierarchy code segment configured to manage room type hierarchy data, a rate type code segment configured to manage rate type data, a rate grid code segment configured to manage rate grid data, an add-on management code segment configured to manage add-on data, an engine customization code segment configured to manage engine customization, and at least one communications code segment configured to manage communications between the system and a plurality of sales channels. The code segments of embodiments of the invention may be stored on a computer readable medium such as hard disk storage, compact disk storage, digital video disk storage, random access memory, dynamic random access memory, read-only memory, static random access memory, and magnetic tape. ***Embodiments of the invention may be implemented in computer***

	software, computer hardware or combinations of computer hardware and software. Embodiments of the invention may be located on one computer or on a plurality of computers connected to one another through a wired or wireless network. Embodiments of the invention may use encrypted on non-encrypted communications over wired or wireless networks. Embodiments of the invention comprise a user interaction code segment configured to manage user interaction that delivers output to users, and accepts input from users via an interface utilizing a web browser such as Internet Explorer™, Navigator™, Opera™, Mozilla Firefox™, or other internet web browser. User input may be in the form of mouse clicks, typed text input from a keyboard or other input device, voice input, or stylus input." EX1004, ¶[0082]. "***Embodiments of the invention are configured to run on general purpose computers.*** Such computers are typically comprised of a central processing unit, random access memory, hard disk storage, mouse, keyboard, and display. Embodiments of the invention may be configured to run on standard operating systems such as Microsoft Windows™, Unix™, Linux™, or any other computer operating system. Embodiments of the invention may be created using standard programming and scripting languages such as C, C++, Fortran, Pascal, Basic, Perl, Python, Visual Basic, Visual C++, Visual C#, Java, Javascript, VBScript, HTML, DHTML, CSS, and awk." EX1004, ¶[0083]. "Promotional discounts from direct mail, website, or email campaigns." EX1004, ¶[0121]. "Each Room Type within the system will be entered with a default selling rate along with the inventory for

	each calendar date. However, the same rate may not be offered to everyone. In certain instances a discount may be offered to a group of EUs. Therefore, the code segment provides functionality to associate various Rate Types with each Room Type for a given date. For example, the rate for a standard room across a series of dates could be as follows:"

	Standard Room-		
Rate Type	04/11/05	04/12/05	04/13/05
Default Rate	$139	$159	$199
AAA ™ Rate	$126	$144	$180
Government Rate	$130	$150	$190
Summer Package Rate	$100	$100	$100

EX1004, ¶[0123]; *see also* EX1004, ¶[0124].

"Calculate the prices for associated Room Types based upon the BAR rate and the price differences. The code segment may be configured to ***perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." EX1004, ¶[0131].

"Automatically recalculate prices for associated Room Types in response to changes in the BAR rate. The ***code segment may be configured to perform calculations automatically and/or perform calculations in response to a user initiated triggering event***, such as a mouse click." EX1004, ¶[0132].

"Communicate the prices to a plurality of sales channels. The ***code segment may be configured to automatically communicate the prices and/or***

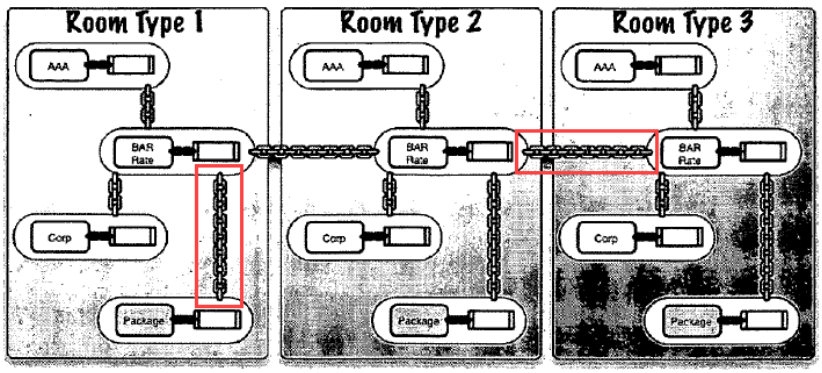
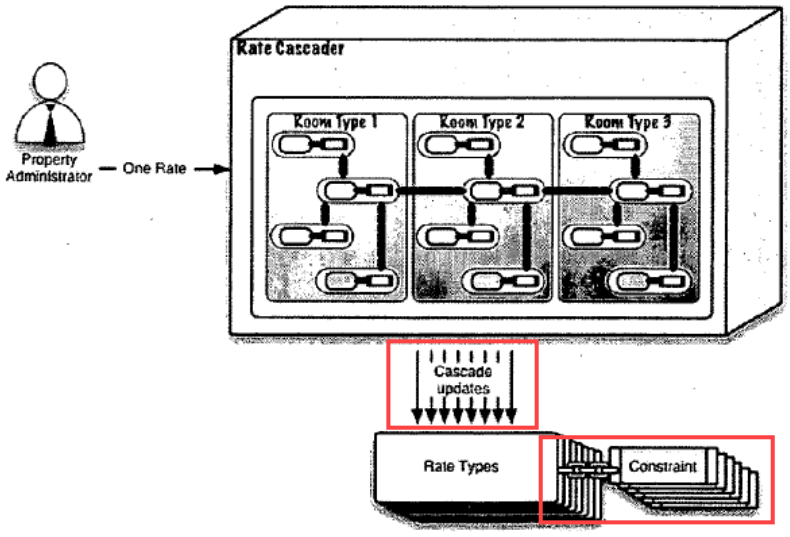
	communicate in response to a user initiated triggering event, such as a mouse click." EX1004, ¶[0133]. "***The Promotion Rate is a Rate Type a Property might create and offer for sale to improve the revenue stream of the property.*** These Rate Types can be set up with restrictions, for example, minimum length of stay and valid only on certain days of week. The promotion Rate Type can be set up to be available permanently or within a specific time frame. The Rate Type can use absolute dollar amounts for room prices or the prices can be floating based upon the BAR rate. This Rate Type will use the inventory that is associated with the BAR. Therefore, if the BAR for standard rooms has 100 rooms, and if 20 rooms are sold at BAR rate, then 80 rooms remain available to be sold at the BAR rate and at any of the promotional rates that are available for the dates." EX1004, ¶[0152]. "***The Promotion Rate with inventory allows the Property to sell only a portion of the rooms at the promotional rate.*** In this case the promotional Rate Type will have its own inventory. If for example, a "Winter Promotion Rate Type" is given an inventory of 20 rooms for the dates December 1 through December 20, any room sold with this Rate Type will not affect the BAR inventory and vice versa." EX1004, ¶[0153]. "The PA monitors room inventory levels for the days in the Rate Type active period to identify the days that might be selling out soonest. If a ***day within the Rate Type active period is selling more quickly than other days in the period, the PA may adjust the price for rooms offered on that date***. The PA may adjust prices

	in response to date changes, for example the price of an unreserved room may be lowered as the reservation date approaches. Selling the room for something is preferable to allowing the room to remain vacant. The PA uses the system to quickly change rates." EX1004, ¶[0176]. "***If a sales channel's Room Type inventory*** *is sold out or* ***is selling better than other channels***, the PA might choose to reallocate inventory to the better-selling channel. Alternatively, the PA may choose to ***close the Rate Type***/Room Type, for a given date or a series of dates, ***for certain channels***." EX1004, ¶[0180]. "The rate management process may be repeated on a regular schedule, such as twice daily, daily, twice weekly or weekly depending upon the needs of the Property. ***Frequent updating and communication of pricing and inventory information to the sales channels keeps the information fresh at the sales channels.***" EX1004, ¶[0185]. "The communications code segment is configured to communicate with at least one sales channel, and/or a plurality of sales channels and comprises communications functions. Once the Rate Types, Room Types, and inventory have been managed through the rate grid mechanism the pricing information, inventory information, and other information is communicated to the selling channels. Other information communicated to the selling channels may comprise add-on information, package information, amenity information, and facility information. ***The information is communicated to the***

	selling channels in response to a triggering event. A triggering event may initiated automatically by the system upon completion of a pricing update, or a triggering event may be initiated by the PA, for example by a mouse click. As shown in FIG. 4, the RezTrip™ system may be connected to a plurality of selling channels comprising the hotel reservation desk, the hotel website, other websites, GDS systems, tour operators, travel agents, computerized reservation providers, telephone reservation service providers and others. ***The updated pricing and availability information may be sent to the selling channels electronically over wired or wireless networks, such as the internet*** or telephone systems, or with facsimile transmission. The information may be communicated in encrypted or unencrypted form." EX1004, ¶[0191]. "The package creation code segment is configured to manage package creation data and package creation functions. Embodiments of the invention provide a way for the PA to create packages/specials/items that can be offered to Eus during the reservation workflow. For example, a Property may have discounted rates. These discounted rates are usually offered during low booking seasons to maintain occupancy levels. The following types of promotions are configurable by the embodiments of the invention:" EX1004, ¶[0224]. "Fixed Rate Promotions: $ per night for a specific room type for a given set of dates." EX1004, ¶[0225]. "Floating Value Promotions: These can be of three types." EX1004, ¶[0226].

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	"A percentage off the rate for that Room Type." EX1004, ¶[0227]. "A dollar amount off the rate for that Room Type." EX1004, ¶[0228]. "The system of claim 1 further comprising a code segment configured to ***communicate pricing information and inventory information to a plurality of sales channels***." Jacob cl.5. "The system of claim 5 further comprising a code segment to ***automatically communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event***." Jacob cl.6. "***A method of managing hotel pricing and inventory information comprising***: providing a database configured to manage hotel data; providing a first code segment configured to manage hotel data; providing a second code segment configured to manage user interaction; interacting with the code segments by: (a) entering portal data; (b) entering property data; (c) entering room type data; (d) entering room hierarchy data; (e) entering rate type data; (f) entering date data; (g) communicating pricing and inventory information to a plurality of sales channels. ***(h) monitoring room inventory***; ***(i) adjusting prices in response to changes in room inventory***; (j) adjusting prices in response to date changes; ***(k) communicating pricing and inventory information to a plurality of sales channels***;

	(l) repeating steps (i) through (l) on a regular schedule." EX1004, cl.13.  Figure 5 EX1004, Fig.5.  Figure 6 EX1004, Fig.6.[33]

[33] Jacob figures 5-6 are cited for obviousness.

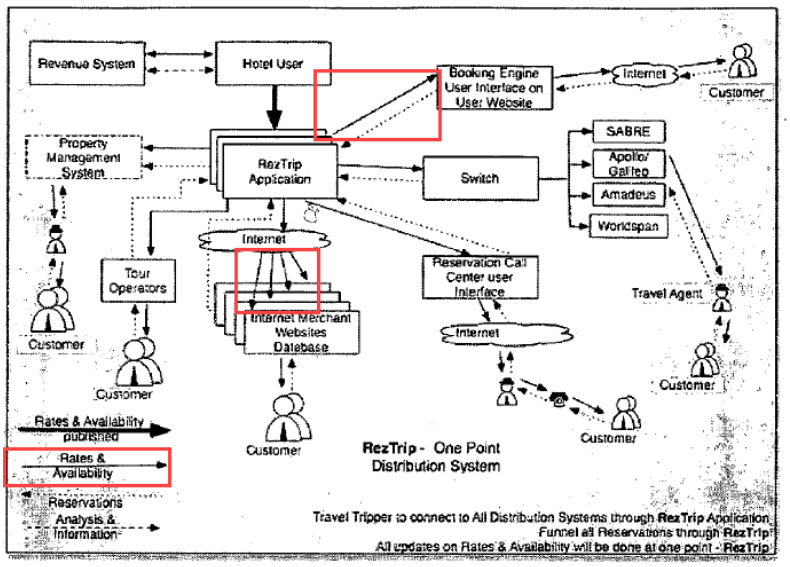


Figure 7

EX1004, Fig.7.

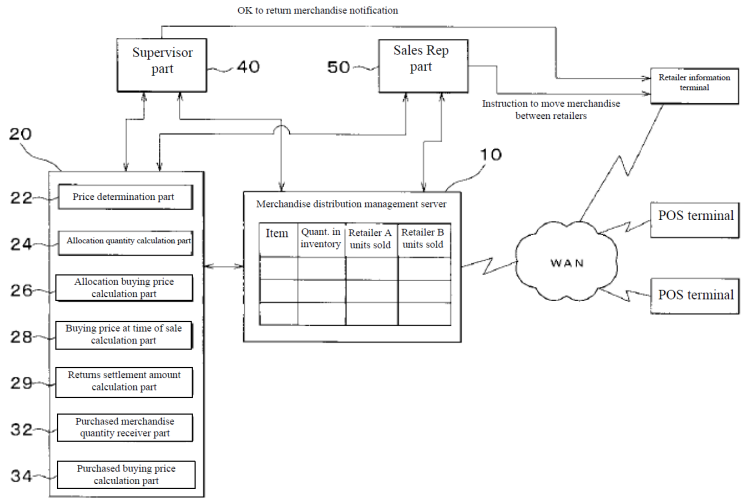
"The invention is provided with a price determination part 22 that ***determines the reference retail price for items sold based on the amount of inventory and the number of parts sold during the part period for each item sold*** which is stored in a merchandise distribution management server 10; an allocation calculation part 24 that calculates the allocation quantity of the items for each retailer; an allocation buying price calculation part 26 that calculates the allocation buying price for each retail outlet based on the allocation quantity of the items; a buying price at the time of sale calculation part 28 that calculates the stocking price of the sold item based on the reference retail price at this stage when the purchased items based on the allocation quantity are sold by each retailer; and a returned goods settlement amount calculation part 29 that calculates the returned goods settlement amount according to the unsold quantity and returned goods fee for the items purchased by each retailer based on the quantity

	allocated thereto." EX1005, Means of Solving the Problems. "The sales management method of the present invention that achieves these objectives, as shown in Fig. 2, is provided with ***a merchandise distribution management server 10 that executes each step***: a step to record the amount of inventory for each item of merchandise sold and the number of units sold during the unit period (S100); a step to determine the reference retail price based on the inventory quantity of the items and the number of units sold during the unit period as stored in the management server (S102); a step to calculate the allocation quantity of the items to the retailers (S104); a step to calculate the allocation buying price of the items for the retailers based on the allocation quantities of the items (S106); a step to calculate the amount of sold purchases based on the reference retail price at the stage when the items purchased based on the allocation quantities are sold by the retailers (S108); and a step to calculate the amount of returned goods settlement based on the unsold quantity of the items purchased by the retailers based on the allocation and the return shipping costs (S110)." EX1005, ¶[0014]. "The ***price determination part 22 determines a reference retail price for the item based on the amount of inventory for each sales item and the number of units sold during the unit period, as stored in the merchandise distribution management server 10. For example, if the number of units sold during the unit period is favorable to the sales volume target, the price determination part 22 takes a strong attitude toward the reference retail price, and if the number of***

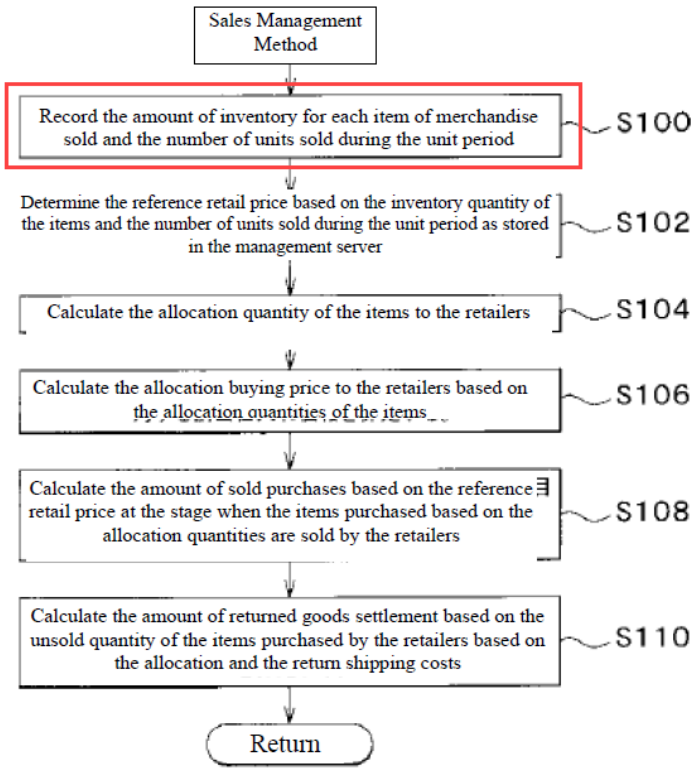
	units sold during the unit period is unfavorable, it takes a weak attitude toward the reference retail price or plans a sales promotion strategy. The reference retail price set by the price determination part 22 allows the manufacturer or other merchandise entity to announce to retailers and consumers the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise, and ***with reference to the merchandise's distribution market***." EX1005, ¶[0019]. "The allocated buying price calculation part 26 calculates the allocated buying price to each retailer based on the allocation quantity of the item in question calculated by the allocation quantity calculation part 24. The allocated buying price is the price that the retailer should pay to the merchandise entity for the allocated merchandise provided by the merchandise entity when buying the merchandise. ***The allocated buying price is based on the reference retail price in the price determination part 22, multiplied by a certain multiplying factor (e.g., 20% of the reference retail price)*** that covers procurement costs, such as the factory production price, plus logistics costs. The entity operating the retail store pays the allocated buying price to the merchandise planning entity within a certain period (e.g., within one month) from the time the goods are allocated and the allocated goods are delivered from the merchandise planning entity. From the perspective of the merchandise planning entity, the allocated buying price is in character a deposit for placing the allocated merchandise with the retailer." EX1005, ¶[0021].

	"The purchase price calculation part 28 calculates the sold purchase price based on the reference retail price at the stage when the relevant item purchased based on the allocation quantity is sold by the retailers. ***The sold buying price is determined according to the buying prices for the retailers at the point of sale by multiplying a certain multiplying factor (e.g., 60% of the reference retail price) based on the reference retail price in the price determination part 22.*** The sold buying price is linked to the reference retail price, which is determined flexibly by the price determination part 22 and differs from the allocated buying price by the amount of the change between the reference retail price and the multiplying factor. Therefore, the retailer determines the purchase price of the allocated merchandise from the merchandise entity by multiplying the allocated merchandise from the merchandise entity by the sold purchase price." EX1005, ¶[0022]. "Next, the ***price determination part 22 sets a reference retail price based on the inventory quantity of the item in question and the number of units sold during the unit period*** as stored in the merchandise distribution management server 10 (S102). The allocation quantity calculation unit 24 then calculates the allocation quantity of the item to the retailers (S104). The allocation buying price calculation unit 26 calculates the allocation buying price for each retailer based on the quota quantity of the item in question (S106). The retailers pay to the merchandise entity an amount equivalent to the allocation buying price which is based on the allocation buying price and the allocation quantity of the item." EX1005, ¶[0025], Fig.3:

Fig. 3



"A sales management system comprising: ***a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale***, which is stored in a merchandise distribution management server; an allocated quantity calculation part that calculates the allocated quantity of the items for each retailer; an allocated stocking price calculation part that calculates the allocated stocking price for each retailer based on the allocated quantity of the item calculated by the allocated quantity calculation part; a time of sale stocking price calculation part that calculates the stocking price of the sold item based on the reference retail price at a stage wherein the stocked items based on the allocated quantity are sold by each retailer; and a returned goods settlement amount calculation part that calculates the returned goods settlement amount according to the returned goods fee and unsold quantity among the items stocked by each retailer based on the allocated quantity." EX1005, cl.1.

	"The sales management system of any one among claims 1 to 3, further comprising: ***a sales rep part that manages the sales progress rate of the items for each retailer among a predetermined number of retailers based on the allocated quantity***, wherein the sales rep part is authorized to transfer the items from retailers having a low sales progress relative to the allocated quantity to retailers having a high sales progress rate." EX1005, cl.4. Fig. 2  EX1005, Fig.2.

See discussion of cl.1[i].

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As Jacob expressly discloses, POSITA would have understood pricing and inventory information sent to Jacob's sales channels as a result of, *e.g.*, an automatically initiated triggering event (initiated by the system), to include ***updated*** pricing and inventory information that has been adjusted or modified as part of Jacob's expressly disclosed "rate management process" (by *e.g.*, Jacob's users, or Jacob's code segments, such as Jacob's revenue management, analysis, and revenue enhancement code segments). *E.g.*, EX1004, ¶[0185]. Jacob also discloses "computer program systems configured to manage the data and perform the methods/functions of the invention," including "code segments… configured to manage hotel data, and other time-dependent inventory data." *E.g.*, EX1004, ¶[0082]. Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose computers." *E.g.*, EX1004, ¶¶[0082], [0083]. Additionally, Jacob discloses (in addition to the possibility of a human administrator providing input (*e.g.*, EX1004, ¶[0180])) that "information is communicated to the selling channels in response to a triggering event. A triggering event may [be] initiated ***automatically*** by the system upon completion of a pricing update" (*e.g.*, EX1004, ¶[0191]), and "a code segment to ***automatically*** communicate pricing information and inventory information to a plurality of selling channels in response to a triggering event" (EX1004, cl.6). *See also* EX1004, ¶¶[0131]-[0133] ("code segment may be configured to ***automatically*** communicate the prices and/or communicate in response to a user initiated triggering event"), cl.31; cl.1[pre]. Jacob further discloses an "analysis code segment" and a "revenue enhancement code segment," (*e.g.*, EX1004, ¶[0006]), and a "revenue management code segment used to analyze the information received from the sales channels… to maximize hotel revenue," *e.g.*, EX1004, ¶[0010]. **POSITA would have understood these disclosures to be an express disclosure—as an alternative to actions triggered by human input—of automatically "adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that meets a performance threshold"** (*e.g.*, "sales channel's Room Type inventory is sold out or is selling better than other channels"; "day within the Rate Type active period is selling more quickly"; "days that might be selling out soonest"; *see* cl.1[g], [i]) and communicating such adjustments to both the system's clients (*e.g.*, Properties) to beneficially make clients aware of such adjustment as well as to the sales channels.

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Further, if it is argued further disclosure is required, as discussed in 1[pre], Jacob in view of Phillips (in the recited combinations) renders obvious carrying out all of Jacob's functions[34] (including, without limitation, adjusting, via the channel interface, a price of the transportation service by an adjustment factor if the performance indicator indicates a performance that meets a performance threshold) ***automatically/without human intervention*** (as Phillips describes).

Additionally, POSITA would have further understood that Jacob provides examples of multiple sales channels, but that Jacob's disclosures would have applied to systems with two or more sales channels. And to POSITA, it would have been obvious from their understanding of basic economics (and optimization of net revenue) to upwardly "adjust" (*i.e.*, raise) a price or prices of items allocated to one or more distribution channels while also downwardly "adjusting" (*i.e.*, lowering) a price or prices of items allocated to one or more other distribution channels (known as "price differentiation") based on a performance indicator indicating a performance of a participant channel meets a performance threshold. For POSITA it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.[35] *See* cl.1[i].

Additionally, **Phillips discloses automatically/without the need for human intervention** (*see* cl.1[pre], [i]) **adjusting the price of an inventory item up or down** (*see* cl.1[i])**.** *See* discussion of cl.1[i].

To the extent it is argued that further disclosure of automatically "**adjusting**" by an adjustment factor based on the performance indicator indicating that a performance that meets a performance threshold is required, **it would have been obvious based Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura**. As discussed, both Jacob and Tamura describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand. *E.g.*, EX1004, ¶¶[0001]-[0002] ("maximize use of time-dependent inventory"), [0005], [0010], [0154]; EX1005, ¶¶[0001] ("reducing lost sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]. As also discussed, Jacob discloses "computer program systems configured

[34] *See* n.4, *supra*.

[35] *See* n.29.

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to manage the data and perform the methods/functions of the invention" and "code segments form a code segment configured to manage hotel data, and other time-dependent inventory data." *E.g.*, EX1004, ¶[0082]; *see also* EX1004, ¶[0005] (update prices with "minimum of data entry by the staff"). Jacob further discloses its system "may be implemented in computer software, computer hardware or combinations of computer hardware and software" and "embodiments of the invention are configured to run on general purpose computers." EX1004, ¶¶[0082], [0083]; *see also* EX1004, ¶¶[0131]-[0133], [0191]. Tamura expressly discloses "a merchandise distribution management server 10 that executes each step" (*e.g.*, EX1005, ¶[0014]), "a price determination part that determines the reference retail price of an item for sale based on the inventory and the number of items sold during the unit period for each item for sale," and "announc[ing] to retailers… the current market value of the item for sale, considering the amount of inventory and sales speed (number of units sold in a unit period) of the merchandise," which POSITA would have understood is the sales progress rate, and "with reference to the merchandise's distribution market," which POSITA would have understood discloses adjusting based on sale data corresponding to at least one or more additional vendor computing devices (*see* cl.1[g]). *E.g.*, EX1005, cl.1; *see also* EX1005, ¶[0019] ("the price determination part 22 takes a strong attitude toward the reference retail price" or "takes a weak attitude toward the reference retail price or plans a sales promotion strategy"), [0025], Fig.3). **POSITA would have been motivated and found it obvious, straightforward, and advantageous to implement Jacob's or Jacob-Phillips's inventory management and distribution system (in the recited combinations) (including Jacob's disclosure of "analyzing the information received from *the* sales channels," closing a Rate Type for a given date or series of dates, for certain channels, and storing such updated pricing information) using Tamura's beneficial teachings of automatically adjusting a price of items if performance meets a performance threshold, such that in the resulting system the adjusting occurs automatically without the need for a user of the combined system to instruct the system to perform such adjustment and the updated price information is communicated to both the system's clients (*e.g.*, Properties) and the sales channels.** To the extent it is argued that automatically adjusting by an adjustment factor based on the performance indicator indicating that a performance that meets a performance threshold is required and is not disclosed by Jacob or rendered obvious by Jacob-Phillips, this would have beneficially furthered both Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent

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inventory" and Tamura's express goals of "reducing lost sales opportunities" by, *e.g.*, reducing the response time/increasing the speed of the system (by reducing the need to wait for and address user intervention) and by increasing the ability of the system to take into account the result of processing sale data from multiple distribution channels in determining whether/how to adjust a price of items, thereby allowing the system to more quickly and effectively address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004, ¶[0002]; *see also* EX1004, ¶[0005] ("The system should allow the administrator to change the pricing of all items based upon…any… factor affecting price, with a minimum of data entry by the staff")). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS. *See* cl.1[i]; *see also* n.30.

In addition, as discussed above (*see* cl.1[i]), Tamura expressly discloses two sales channels ("Retailer A" and "Retailer B"). As such, POSITA would have understood that although Jacob provides examples of multiple sales channels, the disclosures of the combined systems (including adjusting a price of inventory items would have applied to a system with two sales channels, in addition to a system with more.

As discussed above with respect to cls.1[g]-[h], Jacob or Jacob-Phillips (in the recited combinations) in view of Kono renders obvious receiving sale data for one or more participant channels (*see* cl.1[g]) corresponding to the one or more active channel records (*see* cl.1[d]). And as discussed immediately above, Jacob or Jacob-Phillips (in the recited combinations) in view of Tamura renders obvious automatically "**adjusting**" a price of the transportation service based on a performance that meets a performance threshold. **It would have been obvious, straightforward, and advantageous to implement Jacob in view of Kono or Jacob-Phillips in view of Kono (in the recited combinations, including Jacob's code segments) using Tamura's additional teaching of automatically adjusting a price of inventory items based on a performance indicator indicating that a performance that meets a performance threshold. As discussed, both Tamura and Kono describe inventory management systems using sale data received from a plurality of distribution channels to more efficiently manage inventory and better adapt to market demand.** *E.g.*, EX1005, ¶¶[0001] ("reducing lost

sales opportunities"), [0009], [0015] ("eliminating a great deal of waste in the distribution process"), [0041]; EX1007, Summary, ¶¶[0005], [0009]-[0010], [0014]-[0017] ("unnecessary inventory on the market can effectively and successfully [be] reduced"). Implementing the combined system (including the recited Kono combinations) using Tamura's beneficial disclosure of automatically adjusting a price of inventory items based on a performance that meets a performance threshold would have beneficially furthered Jacob's express goal of "maximiz[ing] revenue" of Jacob's "time-dependent inventory," Tamura's express goals of "reducing lost sales opportunities," and Kono's express goal of reducing "unnecessary inventory on the market" by, *e.g.*, allowing the system to more quickly address changing market conditions by increasing or decreasing the price of Jacob's transportation services inventory (and communicating such adjustment to both the system's clients (*e.g.*, Properties) and the sales channels), thus better "insur[ing] maximum use of time-dependent inventory" (*e.g.*, EX1004, ¶[0002]; *see also* EX1004, ¶[0005] ("minimum of data entry by the staff")) and "reducing lost sales opportunities" (EX1005, ¶[0001]). For POSITA (as confirmed by these disclosures and known existing systems) it would have been routine to make such an implementation choice, and clear it would work and provide the expected functionality to yield predictable results with REOS.[36] *See* cl.1[i].

[36] *See* n.30, *supra*.

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Claim 5

5 The computer-implemented method of claim 4, wherein the processing the sale data comprises determining whether or not a supply of transportation services inventory exceeds demand or vice versa per participant channel.	For example, see disclosures provided in relation to cls.2, 4 above.

Claim 6

6 The computer-implemented method of claim 4, wherein the one or more active channel records are linked to the channel interface without the one or more inactive channel records.	For example, see disclosures provided in relation to cls.3, 4 above.

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