

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO. LTD., and SAMSUNG ELECTRONICS
AMERICA, INC.,

Petitioner,

v.

MASSIVELY BROADBAND LLC,

Patent Owner.

U.S. Patent No. 8,224,794

“Clearinghouse system, method, and process for inventorying and acquiring
infrastructure, monitoring and controlling network performance for enhancement,
and providing localized content in communication networks”

DECLARATION OF KEVIN C. ALMEROOTH, PH.D., IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW OF

U.S. PATENT NO. 8,224,794

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LIST OF EXHIBITS

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EX1005	Patent Owner’s District Court Infringement Chart for ’794 Patent
EX1006	U.S. Provisional Patent Application 60/971,175 filed Sep. 10, 2007
EX1007	U.S. Provisional Patent Application 60/977,582 filed Oct. 4, 2007
EX1008	U.S. Provisional Patent Application 61/028,261 filed Feb. 13, 2008
EX1009	U.S. Patent Publication No. 2007/0207800 A1 (“Daley”)
EX1010	U.S. Patent Publication No. 2008/0305747 A1 (“Aaron”)
EX1011	U.S. Patent Publication No. 2008/0186882 A1 (“Scherzer”)
EX1012	U.S. Patent Publication No. 2006/0253453 A1 (“Chmaytelli”)
EX1013	U.S. Patent Publication No. 2003/0216953 A1 (“Dawson”)
EX1014	Intentionally Omitted
EX1015	J. Schiller, Mobile Communications, Addison-Wesley, 2 nd Ed., 2003
EX1016	M. Stemm and R. Katz, “Vertical handoffs in wireless overlay networks,” Mobile Networks and Applications, vol. 3, pp. 335-50, 1998
EX1017	R. Chalmers, G. Krishnamurthi, and K. Almeroth, "Enabling Intelligent Handovers in Heterogeneous Wireless Networks," ACM Journal on Mobile Networks and Applications (MONET), vol. 11, num. 2, pp. 215-227, April 2006

EX1018	S. Soliman, P. Agashe, et al., “gpsOne™: A hybrid position location system.” IEEE, 0-7803-6560-7, pp. 330-35, 2000
EX1019	K. Wang, L. Yan, H. Wen, and K. He, “GpsOne: a New Solution to Vehicle Navigation,” IEEE, 0-7803-8416-4, pps. 341-46, 2004
EX1020	U.S. Patent Publication No. 2003/0125044 A1 (“Deloach”)
EX1021	<i>Fryer’s TowerSource Acquired by Biby Publishing</i> (Dec. 29, 2005)
EX1022	FCC ASR Registration Form 854 (January, 2006)
EX1023	Sample FCC ASR Record
EX1024	FCC ASR Search Screenshot
EX1025	3GPP TX 23.003 Technical Specification, v7.1.0 (September, 2006)
EX1026	Richard Shim, <i>Boingo, T-Mobile Team On Wireless Roaming</i> , CNET (Mar. 18, 2003)
EX1027	M. Gast, 802.11 Wireless Networks – The Definitive Guide, O’Reilly, 1 st Ed., 2002
EX1028	U.S. Patent No. 6,332,127 (“Bandera”)
EX1029	U.S. Patent No. 6,545,596 (“Moon”)
EX1030	U.S. Patent Publication No. 2002/0046084 A1 (“Steele”)
EX1031	U.S. Patent No. 7,110,749 (“Zellner”)
EX1032	G. Heine, GSM Networks: Protocols, Terminology, and Implementation, Artech House, 1999.
EX1033	U.S. Patent No. 6,978,138 (“Japenga”)
EX1034	Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification (3GPP TS 03.03 version 7.8.0 Release 1998, ETSI, 2003
EX1035	Telcom Network Planning for evolving Network Architectures, Reference Manual, Draft Version 4.1, ITU, 28 February 2007.

EX1036	A. Sinclair, GSM Goes to Market, GSM Association, March 2007
EX1037	Intentionally Omitted
EX1038	U.S. Patent Publication No. 2004/0002871 A1 (“Geranio”)
EX1039	Kate Pickert, <i>Invisible Wires</i> , New York (Sep. 4, 2004)
EX1040	American Tower Corporation, 2006 Annual Report (Mar. 21, 2007)
EX1041	MapInfo, Marconi announce availability of deciBel Planner 2.5 and UMTS module, June 7, 2001, available at https://www.wirelessnetworksonline.com/doc/mapinfo-marconi-announce-availability-of-deci-0001 .
EX1042	MapInfo, the 2000 MapInfo Annual Report
EX1043	NIST, Information Security, Electronic Authentication Guideline, Special Publication 800-63 (June 2004)
EX1044	Cisco, <i>Cisco Wi-Fi Becomes Available To Tenants As Part Of Their Commercial Lease</i> (Jun 2, 2003)
EX1045	LightReading, <i>Marconi Teams With ComOpt - Software integration to provide complete wireless planning and automatic optimization solution</i> (Dec. 12, 2002)

I. Introduction

1. I have been retained by Quinn Emanuel Urquhart & Sullivan, LLP on behalf of the Petitioner Samsung Electronics Co., Ltd. (“Petitioner”) as an independent expert in this *inter partes* review (this “Proceeding”) before the Patent Trial and Appeal Board of the United States Patent and Trademark Office (the “Board”) to review claims 1-32 (“the challenged claims”) of U.S. Patent No. 8,224,794 (“the ’794 patent”). I have been asked by the Petitioner to assist in evaluating the claims and the disclosure of the ’794 patent.

A. Qualifications

2. EX1003 is a true and correct copy of my current CV, which describes my education, patents and publications, employment and research history, and professional activities and awards.

1. Educational Background

3. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia

System, minor in Telecommunications Public Policy) earned in June 1997. I have taken a wide variety of courses as demonstrated by my minor. My undergraduate degree also included a number of courses more typical of a degree in electrical engineering, including digital logic, signal processing, and telecommunications theory.

2. Career

4. I am a Professor Emeritus in the Department of Computer Science at the University of California, Santa Barbara (UCSB). While active at UCSB, I held faculty appointments and was a founding member of the Computer Engineering (CE) Program, Media Arts and Technology (MAT) Program, and the Technology Management Program (TMP). I was the Associate Director of the Center for Information Technology and Society (CITS) from 1999 to 2012. I have been a faculty member at UCSB since July 1997.

5. One of the major concentrations of my research has been the delivery of multimedia content and data between computing devices, including various network architectures. In my research, I have studied large-scale content delivery systems, and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds or thousands of users simultaneously. I have also studied smaller-scale content delivery systems in which content is exchanged between individual computers and portable devices. My work has emphasized the

exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

6. In 1992, the initial focus of my research was on the provision of interactive functions (*e.g.*, VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems; in particular, how to aggregate requests for movies at a cable head-end and then how to satisfy a multitude of requests using one audio/video stream broadcast to multiple receivers simultaneously. This research has continually evolved and resulted in the development of techniques to scalably deliver on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

7. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called “multicast,” first deployed as the

Multicast Backbone, a virtual overlay network supporting one-to-many communication. Multicast is one technique that can be used on the Internet to provide streaming media support for complex applications like video-on-demand, distance learning, distributed collaboration, distributed games, and large-scale wireless communication. The delivery of media through multicast often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP.

8. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

9. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (*i.e.*, when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors

in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

10. Protecting networks, including their operation and content, has been an underlying theme of my research almost since the beginning of my research career. Starting in 2000, I have been involved in several projects that specifically address security, network protection, and firewalls. After significant background work, a team on which I was a member successfully submitted a \$4.3M grant proposal to the Army Research Office (ARO) at the Department of Defense to propose and develop a high-speed intrusion detection system. Key aspects of the system included associating streams of packets and analyzing them for viruses and other malware. Once the grant was awarded, we spent several years developing and meeting the milestones of the project. A number of my students worked on related projects and published papers on topics ranging from intrusion detection to developing advanced techniques to be incorporated into firewalls. I have also used firewalls, including their associated malware detection features, in developing techniques for the classroom to ensure that students are not distracted by online content.

11. Recent work ties some of the various threads of my past research together. I have investigated content delivery in online social networks and proposed reputation management systems in large-scale social networks and marketplaces. On the content delivery side, I have looked at issues of caching and cache placement,

especially when content being shared and the cache has geographical relevance. We were able to show that effective caching strategies can greatly improve performance and reduce deployment costs. Our work on reputation systems showed that reputations have economic value, and as such, creates a motivation to manipulate reputations. In response, we developed a variety of solutions to protect the integrity of reputations in online social networks. The techniques we developed for content delivery and reputation management were particularly relevant in peer-to-peer communication.

12. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio and Video (NOSSDAV) workshop and on the Steering Committees for the International Conference on Network Protocols (ICNP), ACM Sigcomm Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI) Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Network, ACM Computers in Entertainment, AACE Journal of Interactive Learning Research (JILR), and ACM Computer Communications Review. I have co-chaired a number of conferences and workshops including the IEEE International Conference on Network Protocols (ICNP), IEEE Conference on Sensor, Mesh and Ad Hoc

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Communications and Networks (SECON), International Conference on Communication Systems and Networks (COMSNETS), IFIP/IEEE International Conference on Management of Multimedia Networks and Services (MMNS), the International Workshop On Wireless Network Measurement (WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the Network Group Communication (NGC) workshop, and the Global Internet Symposium, and I have served on the program committees for numerous conferences.

13. Furthermore, in the courses I taught at UCSB, a significant portion of my curriculum covered aspects of the Internet and network communication including the physical and data link layers of the Open System Interconnect (OSI) protocol stack, and standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed Local Area Networks (LANs). The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. My research and courses have covered a range of physical infrastructures for delivering content over networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL). For a complete list of courses I have taught, see my curriculum vitae (EX1003).

14. I co-founded a technology company called Santa Barbara Labs that was working under a sub-contract from the U.S. Air Force to develop very accurate emulation systems for the military's next generation internetwork. Santa Barbara Labs' focus was in developing an emulation platform to test the performance characteristics of the network architecture in the variety of environments in which it was expected to operate, and, in particular, for network services including IPv6, multicast, Quality of Service (QoS), satellite-based communication, and security. Applications for this emulation program included communication of a variety of multimedia-based services, including video conferencing and video-on-demand.

15. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and include IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

16. Additional details about my employment history, fields of expertise, and publications are further included in my CV (EX1003).

3. Other Relevant Qualifications

17. I am a Member of the Association of Computing Machinery (ACM) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

18. As an important component of my research program, I have been involved in the development of academic research into available technology in the market place. One aspect of this work is my involvement in the Internet Engineering Task Force (IETF). The IETF is a large and open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. I have been involved in various IETF groups including many content delivery-related working groups like the Audio Video Transport (AVT) group, the MBone Deployment (MBONED) group, Source Specific Multicast (SSM) group, the Inter-Domain Multicast Routing (IDMR) group, the Reliable Multicast Transport (RMT) group, the Protocol Independent Multicast (PIM) group, etc. I have also served as a member of the Multicast Directorate (MADDOGS), which oversaw the standardization of all things related to multicast in the IETF. Finally, I was the Chair of the Internet2 Multicast Working Group for seven years.

19. I am an author or co-author of approximately 200 technical papers, published software systems, IETF Internet Drafts and IETF Request for Comments (RFCs). A complete list of my publications is in my CV (EX1003).

20. I have been awarded numerous teaching awards, including Computer Science Outstanding Faculty Member (1997-98, 1998-99, 1999-2000, 2004-06,

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Decl. of Dr. Kevin C. Almeroth

UCSB Spotlight on Excellence Award (2000-01), and UCSB Academic Senate Distinguished Teaching Award (2006-07).

B. Previous Expert Witness Testimony

21. The list of recent matters in which I have testified can be found in EX1003.

C. Preparation for this Declaration

22. In forming my opinions, I have considered the '794 patent specification, including the Abstract, the figures, and the claim language itself, as would have been understood by a person of ordinary skill in the art as of the priority date of the '794 patent (a "POSITA"). My understanding of "POSITA" and "priority date" are set forth below. I have also reviewed the file history of the '794 patent, the Exhibits that are listed in the list of Exhibits, and any other material cited in this declaration.

23. In forming my opinions, I have relied on my personal knowledge and professional experience, and on the documents and information referenced in this declaration.

24. This declaration explains, based on facts and information available to me to date, the subject matter and opinions related to this Proceeding. As such, I am prepared to provide expert testimony regarding opinions formed resulting from my

analysis of the issues considered in this declaration if asked about those issues by the Board or by the private parties' attorneys.

25. Additionally, I may discuss my own work, teachings, and knowledge of the state of the art in the relevant time period. I may rely on handbooks, textbooks, technical literature, and the like to demonstrate the state of the art in the relevant period and the evolution of relevant technologies.

26. Throughout this declaration, I refer to specific pages of the '794 patent and other documents. The citations are intended to be exemplary and are not intended to convey that the citations are the only source of evidence to support the propositions for which they are cited.

27. I am being compensated for my time spent on this matter at a rate of \$850 per hour, and my compensation is in no way contingent upon the outcome of this matter or on the opinions I offer. All of the opinions expressed in this declaration are my own.

II. Legal Understanding

28. In this section, I describe my understanding of certain legal standards that I have relied upon in forming my opinions set forth in this declaration. I have been informed of these legal standards by Petitioner's attorneys. I am not an attorney and I have not thoroughly researched the law on patent invalidity. I am relying only on instructions from Petitioner's attorneys for these legal standards.

A. Claim Construction

29. I have been instructed by counsel that claim construction is a matter of law for the arbiter of law to decide. I understand that in an *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claim in a civil action.

30. I understand that a patent may include two types of claims, independent claims and dependent claims. An independent claim stands alone and includes only the limitations it recites. A dependent claim can depend on an independent claim or another dependent claim. I understand that a dependent claim includes all the limitations that it recites in addition to the limitations recited in the claim from which it depends.

B. Anticipation

31. I understand that a patent claim is anticipated when a single piece of prior art describes every element of the claimed invention, either expressly or inherently, arranged in the same way as in the claim. For inherent anticipation to be found, it is required that the missing descriptive material is necessarily present in the prior art. I understand that, for the purpose of an *inter partes* review, prior art that anticipates a claim can include both patents and printed publications from anywhere in the world.

C. Obviousness

32. I understand that a patent claim is unpatentable and invalid if the subject matter of the claim as a whole would have been obvious to a POSITA as of the time of the invention at issue. My understanding of a POSITA is set forth below. I understand that the following factors must be evaluated to determine whether the claimed subject matter is obvious: (1) the scope and content of the prior art; (2) the difference or differences, if any, between each claim of the patent and the prior art; and (3) the level of ordinary skill in the art at the time the patent was filed. Unlike anticipation, which allows consideration of only one item of prior art, I understand that obviousness may be shown by considering more than one item of prior art. Moreover, I have been informed and I understand that the so-called objective indicia of non-obviousness, also known as “secondary considerations,” are also to be considered when assessing obviousness. These include: (1) commercial success; (2) long-felt but unresolved needs; (3) copying of the invention by others in the field; (4) initial expressions of disbelief by experts in the field; (5) failure of others to solve the problem that the inventor solved; and (6) unexpected results. I also understand that evidence of objective indicia of non-obviousness must be commensurate in scope with the claimed subject matter.

III. The '794 Patent

33. The '794 patent is titled "Clearinghouse system, method, and process for inventorying and acquiring infrastructure, monitoring and controlling network performance for enhancement, and providing localized content in communication networks."

34. The '794 patent lists inventor Theodore S. Rappaport.

35. The '794 patent was filed as U.S. Patent Application No. 12/208,007 on September 10, 2008, and issued on July 17, 2012.

A. Priority Date

36. The '794 patent claims priority to U.S. Provisional Application No. 60/971,175, filed on September 10, 2007, U.S. Provisional Application No. 60/977,582, filed on October 4, 2007, and U.S. Provisional Application No. 61/028,261, filed on February 13, 2008. I have assumed a priority date of September 10, 2007 for purposes of my analysis, but do not offer an opinion whether or not the '175, '582, or '261 provisional applications supports September 10, 2007, as the priority date.

B. Specification

37. The specification discloses that before the alleged invention, intermediaries would help make a market between real property owners and telecommunications carriers desirous of placing infrastructure on that property.

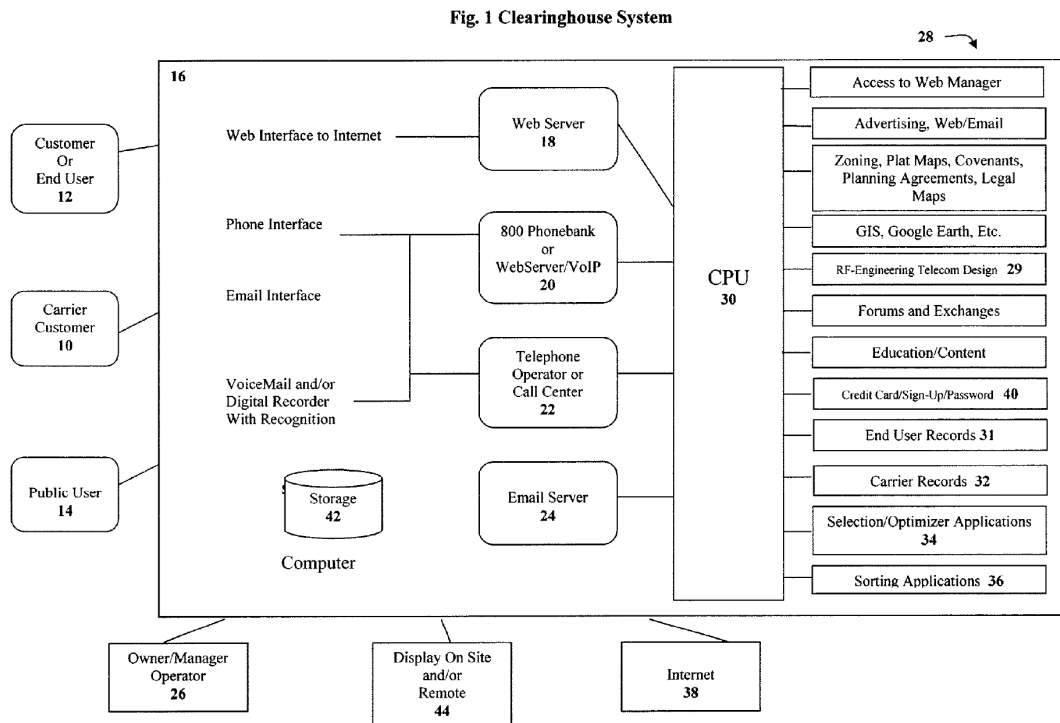
EX1001, 1:22-2:44. It describes that a variety of information and analytics were used when identifying opportunities and negotiating a deal. *Id.* It also describes the existence of online marketplaces and software tools to facilitate such transactions. *Id.*, 2:34-60. The '794 patent asserts that business and technical trends, including developments in wireless connectivity (3:32-4:25), will contribute to demand for an online marketplace specific to telecommunications infrastructure, replacing existing manual markets (4:26-5:59).

38. The patent identifies both (1) firms and websites that use public information to map or plot wireless signal strength/quality and that allow users to comment on the signal strength in a particular area and (2) websites that push advertising to users and similarly allow for user reviews of wireless devices and networks. *Id.*, 7:11-43. The patent acknowledges additional prior art systems and sites. *Id.*, 13:64-16:15.

39. The specification emphasizes the breadth of the purported invention: “This invention applies to any carrier-based system ... no matter what the distance is between users of the network, whether it is wired or wireless, or what the transmitter-receiver separation distance is of wireless components, or what the technology, modulation, access method, etc. may be. That is, this patent is not limited to wireless, optical, cellular, WiMax, Mesh, WiFi, RFID, LMDS, cable, or

satellite, and not limited to fixed, mobile, or portable operation by users...” *Id.*, 9:1-28.

40. Figure 1 of the patent depicts “clearinghouse 16” including “the Clearinghouse computer 30” accessible “via a wide range of interfaces, including web 18, phone 20 or 22..., email 24,...,” and having a database and access to applications and a range of records and information. *Id.* 16:16-46.



41. Aspects of a clearinghouse are disclosed at 16:16-25:29. Modifying that clearinghouse to include information about network performance gathered from user devices and providing information about or based on collected performance information is a focus of 25:30-31:6. Advertising features of the disclosed clearinghouse, including further relevant prior art, are recited at 31:7-35:54.

C. Prosecution History of the '794 Patent (EX1004)

42. The '794 Patent is a pre-AIA patent whose earliest possible priority date is September 10, 2007, via Provisional Application No. 60/971,175 (EX1006). It also claims priority to Provisional Applications No. 60/977,582 (filed Oct. 4, 2007) (EX1007) and No. 61/028,261 (filed Feb. 13, 2008) (EX1008).

43. The '794 patent issued from Application No. 12/208,007, filed Sep. 10, 2008. During prosecution, Applicants overcame Section 103 rejections (based primarily on the combination of U.S. Patent Nos. 6,757,543 ("Moran") and 6,542,588 ("Mashinsky") through a combination of amendment and argument.

44. None of the references argued in this petition were made of record during prosecution.

D. Level of Ordinary Skill in the Art

45. I understand that a person of ordinary skill in the art ("POSITA") is a hypothetical person who is presumed to be aware of all pertinent art, thinks along conventional wisdom in the art, and is a person of ordinary creativity—not an automaton. In deciding the level of ordinary skill, I understand that the following factors may be considered:

- The levels of education and experience of persons working in the field;
- The types of problems encountered in the field; and
- The sophistication of the technology.

46. I understand that the asserted claims of the asserted patents must be evaluated from the perspective of a POSITA. In my opinion, the relevant art for this patent relates to database design or administration, online marketplaces or e-commerce, and wireless network or mobile device management, or equivalents. I understand that the relevant point in time for determining the qualifications of a person of ordinary skill in the state-of-the-art is the time of the alleged invention, which I assume to be the earliest effective filing date for the patent. Here, I understand that the earliest alleged priority date is September 10, 2007.

47. In my opinion, a person of ordinary skill in the art at the time of the '794 patent ("POSITA") had at least a bachelor's degree in computer science, electrical engineering, or a related field, and at least two years (cumulative) of work or research experience in the fields of database design or administration, online marketplaces or e-commerce, and wireless network or mobile device management, or equivalents. Additional work or research experience could substitute for education, and further education could substitute for work or research experience.

48. I meet these criteria now and met them at the time of the alleged invention. I have applied this level of skill in my analysis. My opinions would not change if a slightly higher or lower level of ordinary skill applied.

E. Claim Construction

49. I have been instructed by Petitioner to perform my technical analysis of the disclosures of the prior art by relying on the following constructions. Otherwise, I have applied the plain and ordinary meaning of all other claim terms unless noted otherwise below. I reserve the right to provide additional opinions concerning claim construction or the application of certain claim constructions to the prior art, as appropriate, and to respond to any particular claim construction-related argument advanced by Patent Owner and/or its expert.

50. The following terms are necessary for construction, but only to the extent they are subject to pre-AIA 35 U.S.C. §112, ¶6 as means-plus-function limitations because they use the term “means for” without reciting sufficient structure for performing the claimed function. *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348-49 (Fed. Cir. 2015) (*en banc*). If the Board finds that any of these terms are not means-plus-function limitations, construction of these terms is not necessary. Below, I identify the only structure disclosed in the specification, but I do not concede that it is adequate structure under pre-AIA 35 U.S.C. §112.

1. Claim 23: “means for sending instructions...”

51. **Function:** “sending instructions from one of said one or more electronic interfaces to one or more wireless devices for configuring or reconfiguring

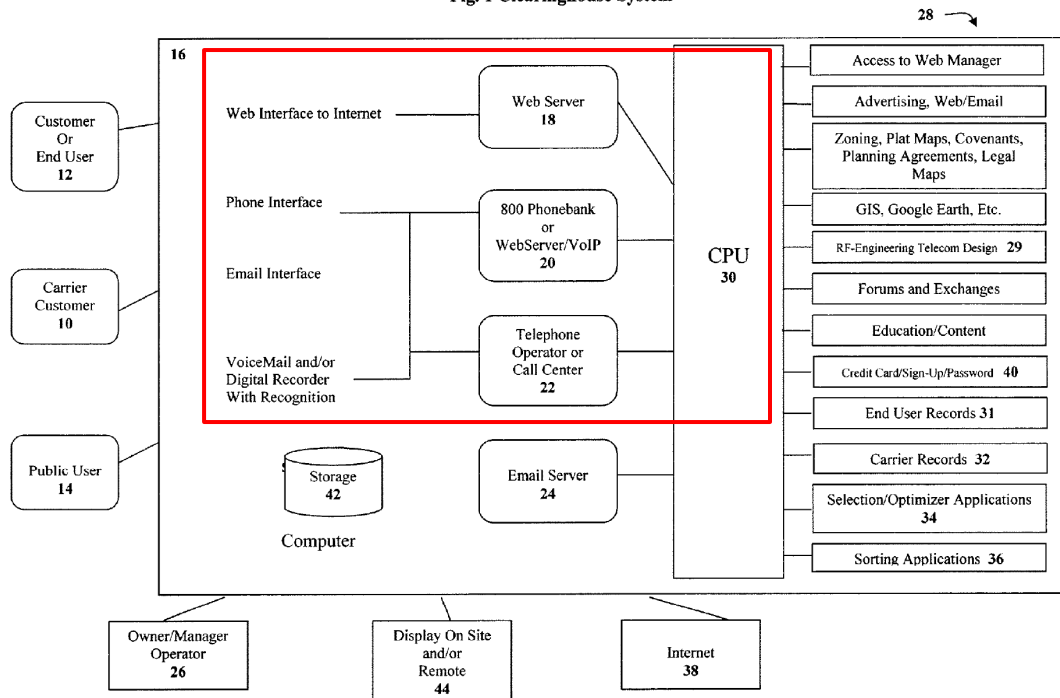
said one or more wireless devices based on a ranking of performance or specific requests of an end user.”

52. **Structure:** a computer configured to send information to a wireless device.

53. Claim 23 depends from claim 20, “further comprising means for sending instructions from one of said one or more electronic interfaces to one or more wireless devices for configuring or reconfiguring said one or more wireless devices based on a ranking of performance or specific requests of an end user.”

54. The specification discloses that users “may have access to the clearinghouse 16 via a wide range of interfaces, including web 18, phone 20 or 22 (using cell phone or wired phone or VoIP phone), email 24, or through automated voice recognition or digital recorders (that may recognize speech, handwriting, fingerprinting, etc).” EX1001, 16:19-24; *see also* 13:42-64. It also discloses that there is processing and computing hardware to “dictate the proper operation of the website, the response to various inputs from users via the worldwide web, telephone, or other various interfaces, and the programs needed to interpret inputs, store and process the received information, and to properly format and display the information...” EX1001, 13:17-41. The configurations that could implement the claimed functionality are discussed at 14:51-16:15 and illustrated in Fig. 1 (discussion at 16:16-46):

Fig. 1 Clearinghouse System



55. A POSITA would therefore have understood that the corresponding structure is “a computer configured to send information an end user or an end user’s device.” This is consistent with Patent Owner’s District Court Infringement Contentions, which identify “one or more processors executing [accused software], in combination with the network communication interface (including APIs and/or wireless/cellular network modules) that transmit data, device management commands, and configuration instructions to managed mobile devices.” EX1005, p. 50.

2. Claim 24: “means for sending a rank ordering...”

56. **Function:** “sending a rank ordering of available telecommunications services from one of said one or more electronic interfaces to one or more wireless devices.”

57. **Structure:** a computer configured to send information to a wireless device.

58. Claim 24 also depends from claim 20, “further comprising sending a rank ordering of available telecommunications services from one of said one or more electronic interfaces to one or more wireless devices.”

59. The specification’s disclosure of structure for sending information to a wireless device is discussed above, with reference to claim 23. Although different content is sent in the function of claim 24, that has no bearing on the structure that performs the sending. Therefore, a POSITA would have understood that the corresponding structure is “a computer configured to send information to a wireless device.”

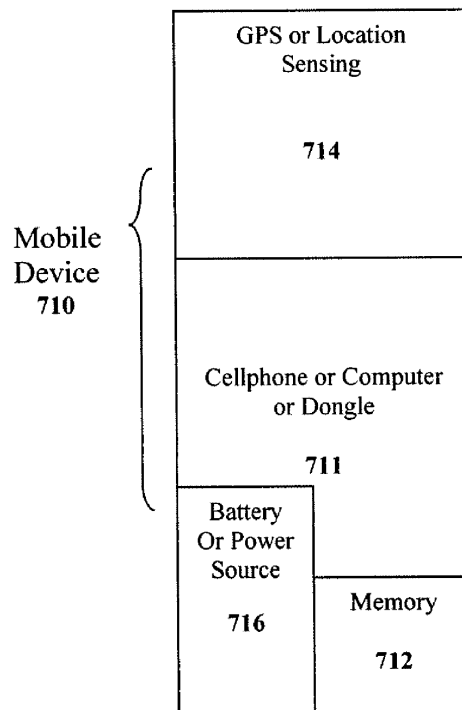
3. Claim 30: “means for identifying...”

60. **Function:** identifying a geographic location of a mobile or fixed device.

61. **Structure:** processor or circuitry configured to identify the geographic location of a device via communication with a device’s GPS or via derivation from other data.

62. Claim 30 depends from independent claim 27 (reciting “wherein a geographic location of one or more mobile or fixed devices is identified”), with additional limitation “wherein said means for identifying a geographic location includes a GPS associated with each of said one or more mobile or fixed devices.”

63. The '794 patent discloses that the device (or the user of the device) may obtain geographic location information using “a GPS or any other location sensing or position estimating techniques 714 that may involve an onboard computer (not shown) in the cellphone or computer 711, or external to the mobile device 710, such as through infrastructure position location methods.” EX1001, 26:9-14, Fig. 7.



EX1001, Fig. 7.

64. As such, the corresponding structure is “processor or circuitry configured to identify the geographic location of a device via communication with a device’s GPS or via derivation from other data.”

65. Consistent with this, during prosecution Applicant identified disclosure in Figure 1 of “a CPU 30 connected to GIS, Google Earth, etc.,” disclosure in Figure 7 of “a GPS device in a telephone,” and disclosure in Figures 8 and 9 of “locationing with towers and telephones,” and asserted that “[t]hese and any other structures equivalent to those described in the application or drawings clearly define the claim term.” EX1004, Applicant Argument/Remarks (May 19, 2011) at 10.

4. Claim 31: “means for determining...”

66. **Function:** determining one more of towers and frequencies being used by said one or more mobile or fixed devices.

67. **Structure:** a computer configured to determine the towers and/or frequencies being used by a mobile device.

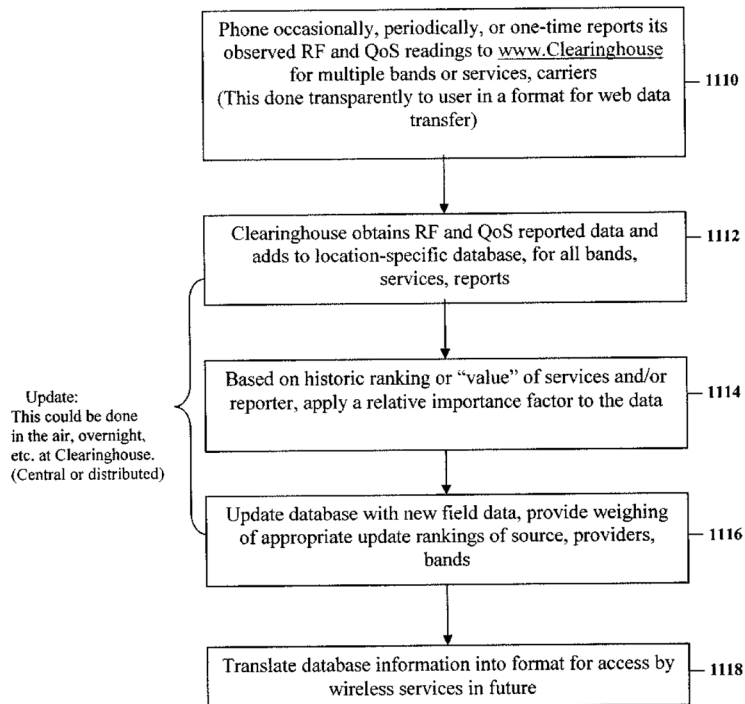
68. Claim 31 also depends from claim 27, “wherein said means for identifying a geographic location includes a means for determining one more of towers and frequencies being used by said one or more mobile or fixed devices.”

69. At step 1110 of the flow illustrated in Fig. 11, a wireless device sends the server information about the tower or frequency the device is using and about

the location of the device, and at step 1112, the information is stored in a database.

EX1001, 28:47-29:52; Fig. 11:

Fig. 11



70. The patent also discloses the server maintaining or having access to a database of tower locations, including the frequencies used by those towers. EX1001, 7:11-43. A POSITA would have understood that because the specification discloses that the clearinghouse has access to the location of the device, even if a device does not report information about the tower or frequency it is using, the server can determine that information by comparing tower data (such as the tower's location) with information about the device, including its location. EX1001, 32:32-57.

71. Thus, the corresponding structure is “a computer configured to analyze received and stored information to determine the frequency or tower being used by a device.”

F. Challenged Claims

72. I understand that claims 1-32 are at issue in Petitioner’s petition for *inter partes* review. They are reproduced below for reference.

Claim	Limitation
1[pre]	A clearinghouse system for communications networks, comprising:
1[a]	one or more computers which interface with a database, said database including
1[a][i]	records for one or more telecommunications carriers which identify infrastructure needs for one or more telecommunications carriers in terms of one or more of (i) types of equipment and performance characteristics for said types of equipment, (ii) location information including one or more of geographical areas, and (iii) desired business terms for said infrastructure needs, and
1[a][ii]	records of a plurality of end users which identify one or more of (i) telecommunications assets owned or controlled by said end users including geographic location and type of available or existing telecommunications assets (ii) property assets owned or controlled by said end users including geographic location, and (iii) desired business terms or preferences for use of said telecommunications assets or said property assets;
1[b]	one or more electronic interfaces to said one or more computers which permit one or more telecommunications carriers and one or more end users to selectively view or catalog information about (a) available telecommunications assets or properties and locations thereof, (b) the owners or tenants of said available telecommunications assets or properties, (c) infrastructure needs of one or more telecommunications carriers, and (d) proposed business

Claim	Limitation
	terms for fulfilling said infrastructure needs with said telecommunications assets or said property assets,
1[c]	wherein notification is provided to either or both: one or more of the owners or tenants of said available telecommunications assets or properties; and the one or more telecommunications carriers;
1[d]	when suitable available telecommunications assets or properties for said infrastructure needs of said one or more telecommunications carriers at one or more locations are identified.
2	The clearinghouse system of claim 1 wherein said database includes public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic locations, and information about carriers serving said geographic locations.
3	The clearinghouse system of claim 1 wherein said one or more electronic interfaces permits one or more public users, who are not telecommunications carriers or end users, to selectively view or catalog information about said available telecommunications assets or properties and locations thereof, and said infrastructure needs of one or more telecommunications carriers for one or more locations.
4	The clearinghouse system of claim 1 wherein said one or more electronic interfaces includes one or more of an Internet interface, a telephone, a speech, handwriting or fingerprint recognition device, electronic mail interface, a facsimile, voicemail, a webserver, a wireless or portable computing or communications device, VoIP, or a digital recorder.
5	The clearinghouse system of claim 1 wherein at least one of said one or more electronic interfaces is connected to the world wide web, and wherein said records for one or more telecommunications carriers and said records for a plurality of end users can be viewed using a browser and can be retrieved by a web crawler.

Claim	Limitation
6	The clearinghouse system of claim 1 further comprising a security application which protects the identity and infrastructure needs of said one or more telecommunications carriers.
7	The clearinghouse system of claim 1 further comprising a security application and billing application which permits charging said one or more telecommunications carriers or said one or more end users at selectable rates for use of said clearinghouse system.
8	The clearinghouse system of claim 1 further comprising a communications application which permits secure negotiation and acceptance of business and legal terms between one or more telecommunications carriers and one or more end users for use of said one or more telecommunications assets or one or more property assets.
9	The clearinghouse system of claim 8 wherein said property assets are selected from a building, a roof top, a billboard, a tower, and a lot or acreage.
10	The clearinghouse system of claim 1 wherein said database includes performance or quality of service information for specific locations.
11	The clearinghouse system of claim 10 wherein one of said one or more electronic interfaces provides automatic or manual updates of said performance or quality of service information from one or more mobile or fixed devices located in said specific locations.
12	The clearinghouse system of claim 10 wherein said one or more electronic interfaces provides performance or quality of service information to one or more mobile or land devices that is located in or will be located in said specific locations.
13	The clearinghouse system of claim 10 wherein said performance or quality of service information includes multiple bands and multiple carriers.
14	The clearinghouse system of claim 1 further comprising one or more local ad servers connected to said one or more electronic interfaces, said local ad servers providing localized content to one or more mobile or fixed devices in a specific location.

Claim	Limitation
15	The clearinghouse system of claim 14 further comprising one or more base stations connected to said one or more electronic interfaces.
16	The clearinghouse system of claim 14 wherein said local ad servers provide web page view and usage statistics to said database through said one or more electronic interfaces.
17	The clearinghouse system of claim 1 further comprising a computation application, which interfaces with at least one of said one or more computers, and which identifies optimum or prioritized locations for said infrastructure needs based on said records of said plurality of end users.
18	The clearinghouse system of claim 2 further comprising a computation application, which interfaces with at least one of said one or more computers, and which identifies optimum or prioritized locations for said infrastructure needs based on both said records of said plurality of end users and said public records.
19	The clearinghouse system of claim 1 further comprising an application program for forming binding agreements between at least one of said one or more telecommunications carriers and at least one of said plurality of end users.
20[pre]	A clearinghouse system for communications networks, comprising:
20[a]	one or more computers which interface with a database, the database including performance or quality of service information for one or more specific locations, and one or more of
20[a][i]	records for one or more telecommunications carriers which identify infrastructure and location information for one or more specific locations,
20[a][ii]	records for one or more end users which identify telecommunications assets or property assets owned or controlled by said one or more end users, and
20[a][iii]	public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances

Claim	Limitation
	for said geographic locations, contact information for government officials for said geographic locations, and information about carriers serving said geographic locations;
20[b]	one or more electronic interfaces to said one or more computers which permit performance or quality of service information obtained from one or more mobile or fixed devices that are located in one of said one or more specific locations to be automatically or manually updated into said database, and which permits at least one of said one or more telecommunications carriers or said one or more end users or one or more parties which are not telecommunications carriers or end users to review, catalog or sort information in said database; and
20[c]	one or more applications operable with said one or more mobile or fixed devices or said one or more computers for obtaining and providing said performance or quality of service information to said one or more electronic interfaces.
21	The clearinghouse system of claim 20 wherein said one or more electronic interfaces provides performance or quality of service information to one or more mobile or fixed devices that are located in or will be located in said specific locations.
22	The clearinghouse system of claim 20 wherein said performance or quality of service information includes multiple bands and multiple carriers.
23	The clearinghouse system of claim 20 further comprising means for sending instructions from one of said one or more electronic interfaces to one or more wireless devices for configuring or reconfiguring said one or more wireless devices based on a ranking of performance or specific requests of an end user.
24	The clearinghouse system of claim 20 further comprising means for sending a rank ordering of available telecommunications services from one of said one or more electronic interfaces to one or more wireless devices.
25	The clearinghouse system of claim 20 further comprising a monitoring application which permits monitoring of radio operating

Claim	Limitation
	conditions of one or more wireless devices, wherein monitored radio operating conditions are used to update performance or quality of service information in said database.
26	The clearinghouse system of claim 20 further comprising one or more wireless devices which are configured to provide said performance or quality of service information to one of said one or more of said electronic interfaces.
27[pre]	A content providing system which provides selected content to one or more mobile or fixed devices located in specific locations, comprising:
27[a]	a clearinghouse system for communications networks, said clearinghouse system including
27[a][i]	one or more computers which interfaces with a database, said database including one or more of
27[a][i][1]	performance or quality of service information for one or more specific locations,
27[a][i][2]	records for one or more telecommunications carriers which identify infrastructure and location information for one or more specific locations,
27[a][i][3]	records for one or more end users which identify telecommunications assets or property assets owned or controlled by said one or more end users, and
27[a][i][4]	public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic locations, and information about carriers serving said geographic locations; and
27[a]ii	one or more electronic interfaces to said one or more computers which permit one or more mobile or fixed devices to be connected to said clearinghouse system, said one or more electronic interfaces permitting one or more of performance or quality of service information obtained from said one or more mobile or fixed devices

Claim	Limitation
	that are located in one of said one more specific locations to be automatically or manually updated into said database, and
27[a][iii]	at least one of said one or more telecommunications carriers or said one or more end users or one or more parties which are not telecommunications carriers or end users to review, catalog or sort information in said database;
27[b]	wherein a geographic location of one or more mobile or fixed devices is identified; and
27[c]	one or more local ad servers in communication with said one or more electronic interfaces of said clearinghouse system configured to use said geographic location, said local ad servers providing localized content to said one or more mobile or fixed devices.
28	The content providing system of claim 27 further comprising one or more base stations in communication with said one or more electronic interfaces of said clearinghouse system.
29	The content providing system of claim 27 wherein said local ad servers provide web page view and usage statistics to said database of said clearinghouse system through said one or more electronic interfaces.
30	The content providing system of claim 27 wherein said means for identifying a geographic location includes a GPS associated with each of said one or more mobile or fixed devices.
31	The content providing system of claim 27 wherein said means for identifying a geographic location includes a means for determining one more of towers and frequencies being used by said one or more mobile or fixed devices.
32	The content providing system 27 wherein said local ad servers provide content to said one or more mobile or fixed devices tuned to a specific transmitted signal.

IV. Grounds

Ground	Basis	Reference(s)	Claims
1	§103	Dawson, Geranio	1-10, 12, 17-19
2	§103	Dawson, Geranio, Aaron	11, 13, 20, 22, 25, 26
3	§103	Dawson, Geranio, Aaron, Chmaytelli	14-16, 27-32
4	§103	Daley, Aaron, and Scherzer (and alternatively Dawson)	20-26
5	§103	Daley, Aaron, Scherzer, and Chmaytelli (and alternatively Dawson)	27-32
6	§102	Scherzer (alternatively §103 with Dawson)	20-25

A. Prior Art

1. Dawson

73. U.S. Patent Application Publication 2003/0216953 (“Dawson”) was filed on May 15, 2002 and published on November 20, 2003. Dawson is prior art under at least pre-AIA 35 U.S.C. §§ 102(a), (e).

74. Dawson relates to “organizing sales activity for a wireless communications system.” EX1013, [0007]. Dawson discloses that providing wireless service to a potential customer must overcome two distinct hurdles: “securing the legal rights to install the requisite wireless infrastructure” and being able to “provide an acceptable signal to the wireless infrastructure.” EX1013, [0005]-[0006]. A POSITA would have recognized that these dual requirements—legal authorization and technical feasibility—represent fundamental prerequisites that must be satisfied before wireless service deployment can proceed. This framework acknowledges that successful wireless deployment requires both

contractual agreements for physical infrastructure placement and technical validation of signal propagation characteristics.

75. Dawson discloses a database system and method for “organizing information relating to” fixed wireless communications service providers. EX1013, [0009]. The database focuses on “site centric” data management for deployment of wireless infrastructure and provision of wireless network services. EX1013, [0009], [0022]. This site-centric architecture organizes all relevant data around specific geographic locations, creating a unified information repository for each potential or active deployment site. The database captures information relating to “all aspects of the [wireless services] business,” which includes, among other things, “portfolios of roof rights held by” or “that can be obtained by the wireless service provider,” “commissions,” “engineering data,” “leases,” “contacts,” etc. EX1013, [0019]. A POSITA would have understood that this comprehensive data model integrates legal, technical, and business information into a single management platform. The inclusion of roof rights portfolios addresses the legal authorization requirements, while engineering data supports technical feasibility assessments. Therefore, Dawson’s database architecture enables coordinated management of both business and technical aspects of wireless service deployment.

76. The system also integrates with signal coverage tools and mapping/terrain tools, tying signal strength evaluations to geographic data. EX1013,

[0026]-[0027], Figs. 1, 3. Potential installation sites (e.g., buildings or rooftop locations) are identified and classified based on “real estate friendliness and the ability of the wireless server’s network to provide an acceptable signal.” EX1013, [0009]. Through this dual classification system, sites receive both legal viability ratings and technical feasibility scores, enabling systematic prioritization of deployment opportunities. Wireless service providers can view and select sites for service provision or expansion. EX1013, [0028], [0031]. Sales managers can track all sales activities and sales data based on sites. EX1013, [0030]. This functionality transforms the database into an operational platform that supports active business processes and decision-making. Customers can determine coverage and request wireless service at their sites and exchange legal rights and terms. EX1013, [0034]. A POSITA would have recognized that this customer-facing capability creates a bidirectional marketplace where potential customers can assess service availability while providers can evaluate deployment opportunities.

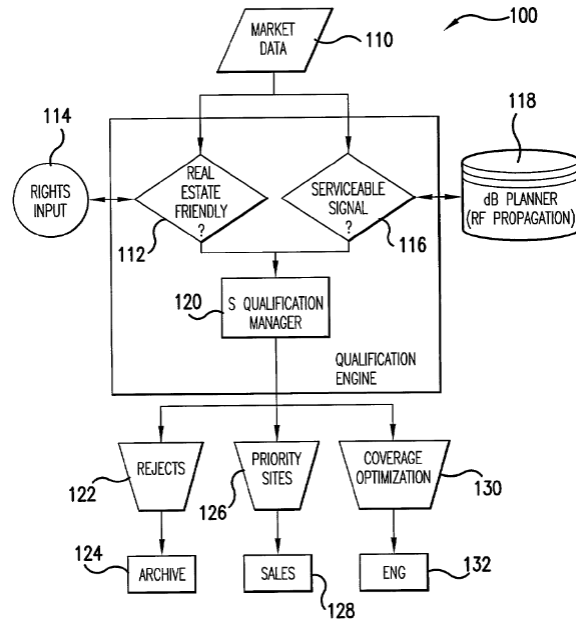


FIG.1

EX1013, Fig. 1.

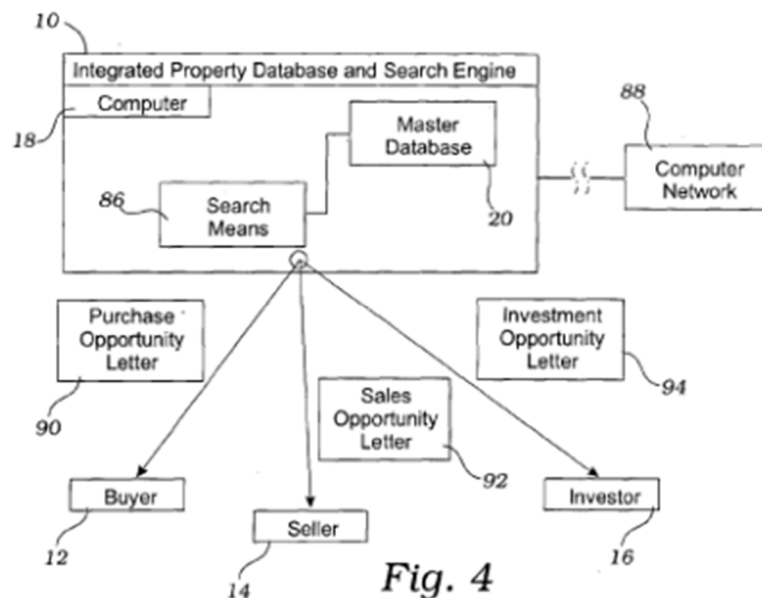
77. Thus, Dawson’s integrated system establishes a comprehensive platform that addresses all aspects of wireless service deployment from initial site assessment through customer acquisition.

2. Geranio

78. U.S. Patent Application Publication 2004/0002871 (“Geranio”) was filed on June 27, 2003 and published on January 1, 2004. Geranio is prior art under at least pre-AIA 35 U.S.C. §§ 102(a), (e).

79. Geranio discloses “an integrated property database and search engine for matching properties with buyers.” EX1038, [0013]. In my opinion, Geranio’s system provides an end-to-end clearinghouse for searching and transacting on real properties. The “integrated property database and search engine 10” includes a

“master database 20,” which includes “a buyers 12 database, a sellers 14 database, and an investors 16 database.” EX1038, [0013], [0028], Fig. 1. The system also includes a “search means 86” for “identifying properties in the property for sale database 22” that match the criteria such as location and sale price specified by the “buyer 12” using a search algorithm. EX1038, [0042], Figs. 1, 4. The system also facilitates buy-sell transactions by generating and transmitting offers and acceptances among the buyer 12, seller 14, and/or investor 16. EX1038, [0043]-[0044]. It can further complete all legally required terms of the deal, create a legally binding agreement, and make escrow arrangement. EX1038, [0044]-[0045].



EX1038, Fig. 4.

3. Aaron

80. U.S. Patent Application Publication 2008/0305747 (“Aaron”) is prior art under at least pre-AIA 35 U.S.C. § 102(e), having been filed June 7, 2007 and

published December 11, 2008, and thus before the earliest effective filing date of the '794 Patent.

81. Aaron describes methods and systems for measuring the service quality of wireless telecommunications systems through collecting and measuring service quality information from wireless devices along with the geographic location of the wireless devices. EX1010, Abstract, [0004]-[0005]. In my opinion, Aaron discloses a comprehensive quality measurement framework that combines service performance metrics with precise location data to create geographically-aware network quality assessments. A POSITA would have understood that this dual collection of service quality information and geographic location enables spatial analysis of network performance characteristics.

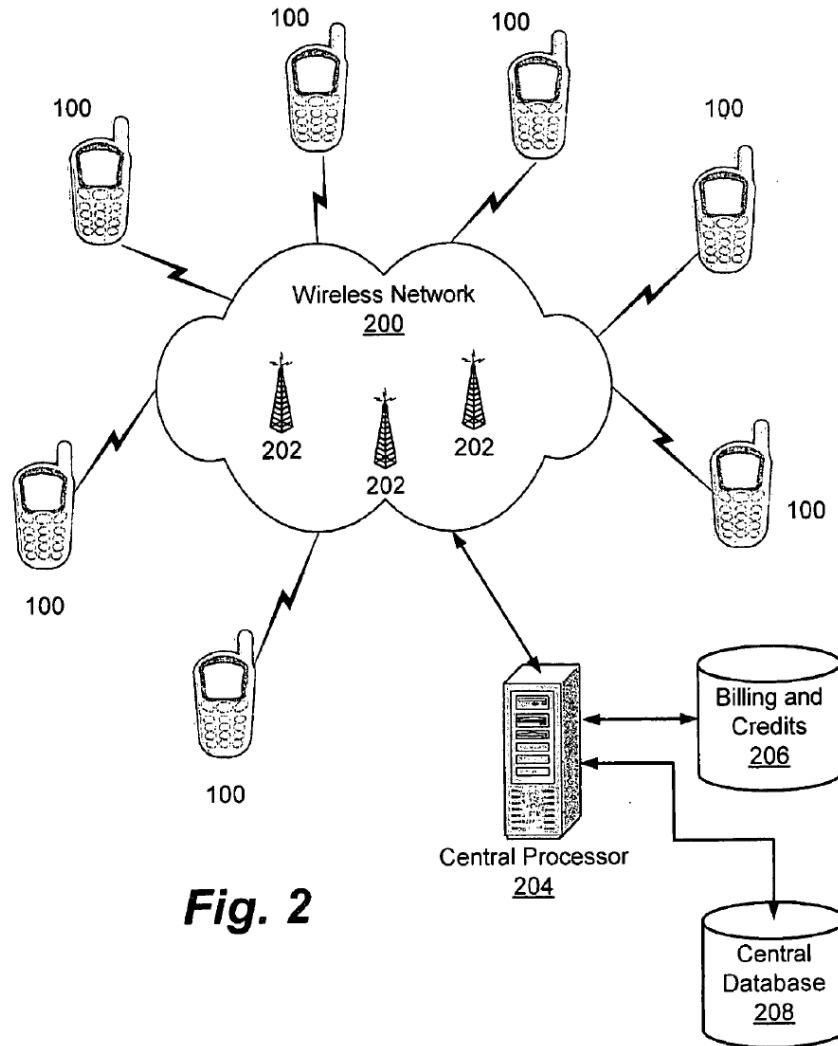


Fig. 2

EX1010, Fig. 2.

82. The wireless devices measure service quality based on performance parameters such as “the signal strength of a radio link between the wireless terminal 100 and a base station 202, the signal quality of a radio link between the wireless terminal 100 and a base station 202, and the occurrence of a dropped call. SNR (signal-to-noise ratio) may also be used.” EX1010, [0040]. These performance parameters provide quantitative metrics that directly reflect the user’s service

experience and network reliability. A POSITA would have recognized that signal strength measurements indicate coverage adequacy, signal quality metrics reveal interference levels and transmission clarity, and dropped call occurrences identify service continuity failures. The inclusion of SNR measurements further enables precise characterization of the communication channel's performance by quantifying the relationship between desired signal power and background noise.

83. The wireless devices determine their geographic location based on a GPS receiver or based on the base stations they use. EX1010, [0006], [0042].

84. The quality of service performance information and geographic location information from wireless devices is sent to a central processor that stores the received information in a central database. EX1010, [0036]-[0037], [0043]. In my opinion, this centralized data collection architecture enables systematic aggregation and analysis of network-wide performance data. The central database serves as a persistent repository that accumulates historical performance trends and enables temporal analysis of service quality. The wireless service provider may use the quality of service and associated location information to identify problems within the wireless communications system. EX1010, [0009], [0031], [0052], [0054]. A POSITA would have understood that correlating quality metrics with geographic coordinates allows operators to generate coverage maps, identify dead zones, and detect interference sources with precise spatial resolution. This location-aware

problem identification capability allows issues that may otherwise be diagnosed as generalized “network issues” to be recognized as location-specific problems that can be addressed through targeted infrastructure improvements.

4. Chmaytelli

85. U.S. Patent Application Publication 2006/0253453 (“Chmaytelli”) was filed on May 31, 2005 and published on November 9, 2006, and is prior art under at least pre-AIA 35 U.S.C. §§ 102(a) and (e).

86. Chmaytelli describes methods and systems for delivering ads to a mobile device with content tailored to the device’s geographic location. EX1012, Abstract, [0010]-[0016]. Chmaytelli discloses an ad server for distributing ads that are associated with geographic areas of interest. EX1012, [0011]-[0016], [0075], [0080]. The location of the mobile device is determined (via, e.g., GPS or a recently used tower). EX1012, [0070], [0078]-[0079], [0082]. When the mobile device is within the targeted geographic area of an ad, the server triggers delivery of the ad to the device. EX1012, [0080]-[0084]. Ad views and usage are monitored to enhance targeted content generation and delivery, conversion rates, and user experiences. EX1012, [0043], [0049], [0051].

5. Daley

87. U.S. Patent Application Publication 2007/0207800 (“Daley”) is prior art under at least pre-AIA 35 U.S.C. § 102(a) and 102(e), having been filed February

20, 2007, and published September 6, 2007, before the earliest possible effective filing date of the '925 Patent—September 10, 2007. Daley incorporates by reference U.S. Provisional Applications 60/774,406, “Diagnostics and Monitoring Services In a Mobile Network For A Mobile Device,” filed Feb. 17, 2006; 60/664,249, “Device Client Specification,” filed March 21, 2005; and 60/249,606, “System and Method for Updating and Distributing Information,” filed November 17, 2000.

88. In my opinion, Daley describes a comprehensive system architecture for managing and monitoring mobile devices and the mobile networks to which they connect. EX1009, Abstract, [0031], [0032], [0038], [0047]-[0056]. The disclosed system implements coordinated management functions that enable network operators to track device performance, monitor network conditions, and optimize mobile device operations across the network infrastructure. A POSITA would have recognized that this management and monitoring architecture provides the technical foundation necessary for centralized control of distributed mobile devices. Therefore, Daley’s system establishes the fundamental framework for network-based mobile device management.

89. Figure 1 illustrates a detailed system architecture that includes the mobile device 107, its client-side software components, and the network operator’s server-side components. EX1009, Fig. 1, [0033], [0035]. This figure demonstrates the technical relationship between the mobile device’s internal software modules

and the corresponding server-side management infrastructure. A POSITA would have understood that the illustrated architecture depicts both the local device components responsible for data collection and the remote server components that process and analyze this information. The system architecture presented in Figure 1 specifically shows how client-side components interface with network operator systems to enable bidirectional communication and control. Through this architectural design, the mobile device 107 can both report its operational status to the server and receive management commands from the network operator's server-side infrastructure. Thus, Figure 1 establishes the technical framework for implementing comprehensive mobile device management functionality.

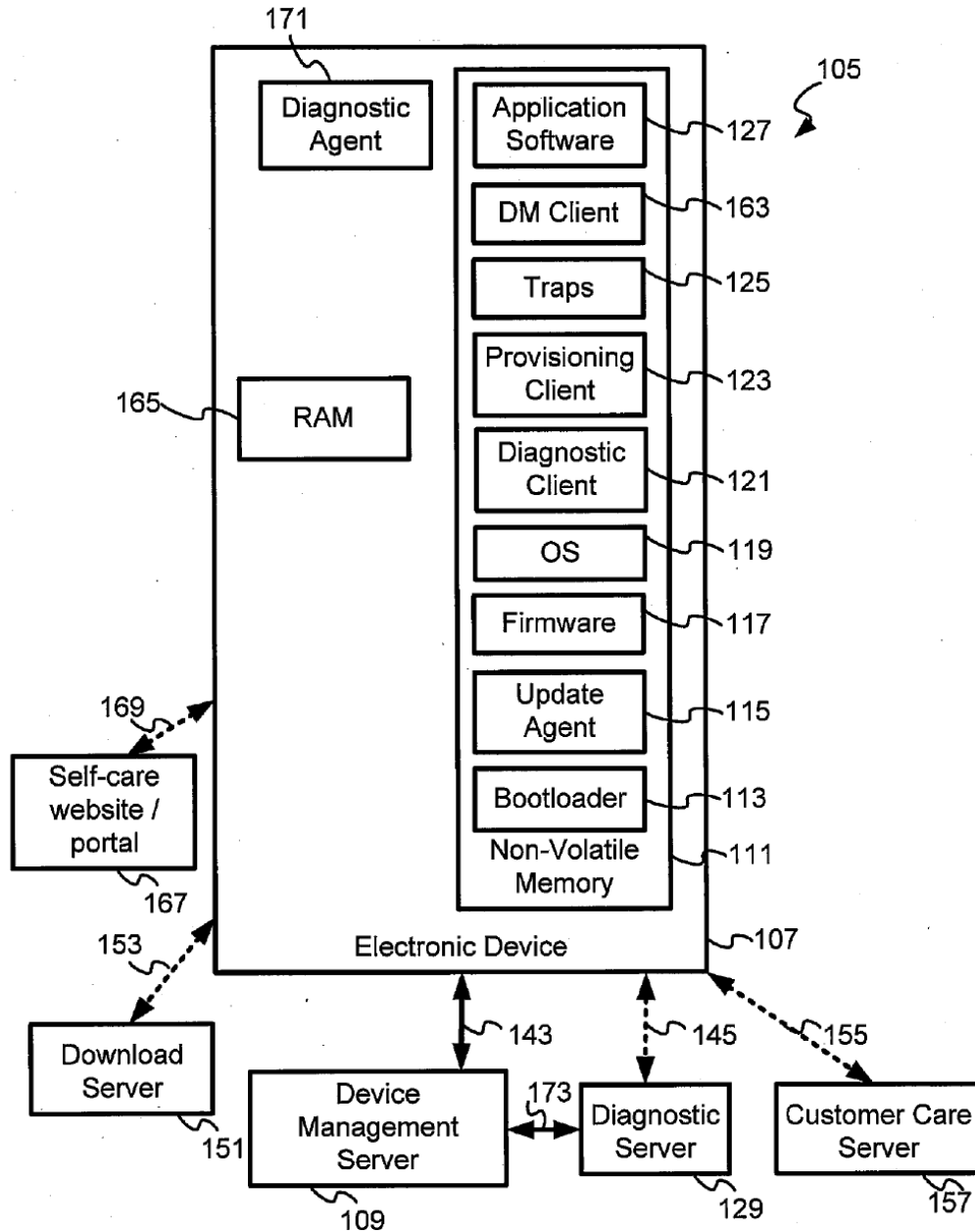


FIG. 1

90. The client-side software components running on the mobile device 107 include: device management client, diagnostic client, provisioning client, update agent, and traps client. EX1009, [0035]. In my opinion, these components collectively establish a comprehensive software framework that enables systematic

device control and monitoring capabilities. These components configure, update, and monitor the mobile device. EX1009, [0035]-[0041].

91. A POSITA would have recognized that each component serves a distinct technical function within the overall management architecture. Specifically, the device management client handles configuration changes and operational controls, while the diagnostic client collects performance metrics and system status information. The provisioning client enables network-specific settings and service activation, the update agent manages software and firmware updates, and the traps client captures and reports exceptional conditions or errors. This modular software architecture provides granular control over different aspects of mobile device operation. Therefore, these client-side components implement the essential functionality required for comprehensive mobile device management.

92. The operator's server-side components include the download server, device management server, diagnostic server, customer care server, and self-care website/portal. EX1009, [0033]. These server-side components form the centralized infrastructure that manages multiple mobile devices across the network. A POSITA would have understood that this server architecture implements a management system where each server component handles specific operational responsibilities. A POSITA would have further understood that these components may be implemented in flexible ways from fully integrated to highly distributed or

in some hybrid mode—some modules may be co-located or consolidated while others are separated or remotely deployed, depending on design preferences, performance considerations, scalability requirements, etc.

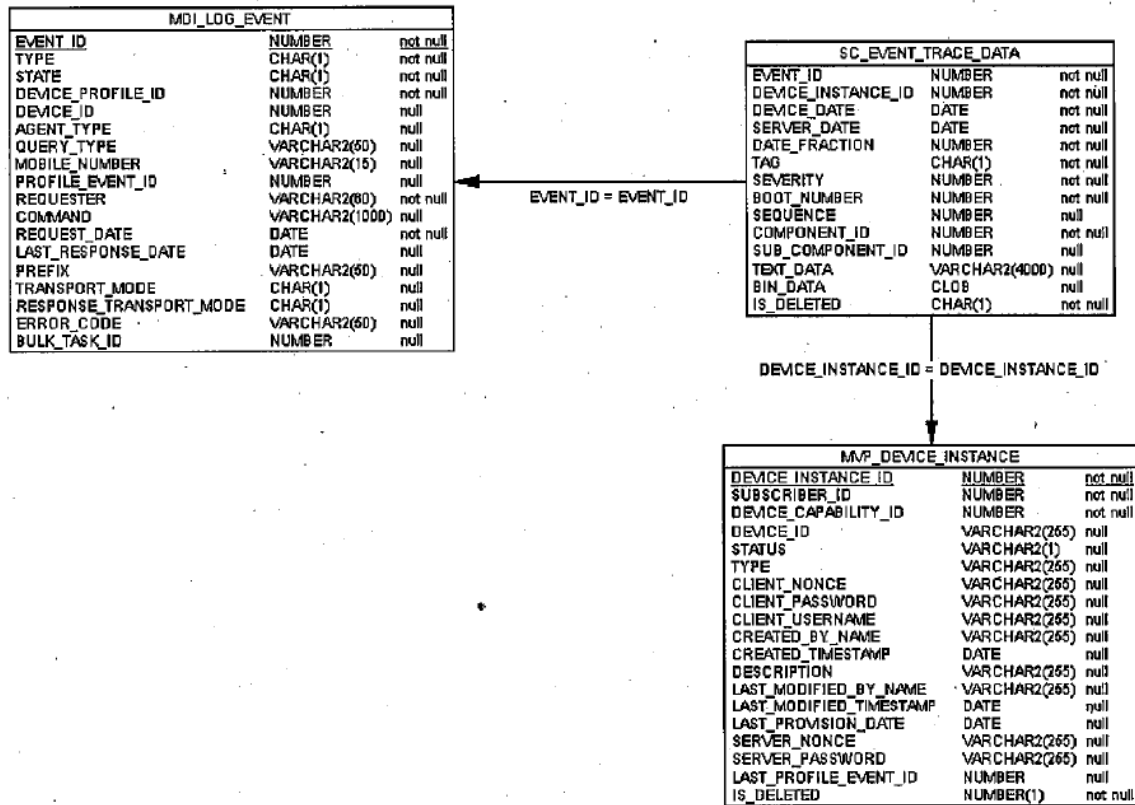
93. The servers perform different management functions—the download server distributes software updates and content, the device management server coordinates configuration and control operations, and the diagnostic server processes performance data and system analytics. Additionally, the customer care server enables operator-assisted troubleshooting, while the self-care website/portal provides user-initiated management capabilities. Through this multi-server architecture, the system achieves scalable management of numerous mobile devices while maintaining functional separation of concerns. Thus, Daley's server-side components establish the backend infrastructure necessary for large-scale mobile device management.

94. The client components communicate with the server components, allowing the network operator to remotely diagnose and resolve problems faced by the customer/subscriber. EX1009, [0034], [0038]. In my opinion, this bidirectional communication architecture establishes the real-time remote troubleshooting and problem resolution. A POSITA would have recognized that this enables network operators to access device status information without requiring physical access to

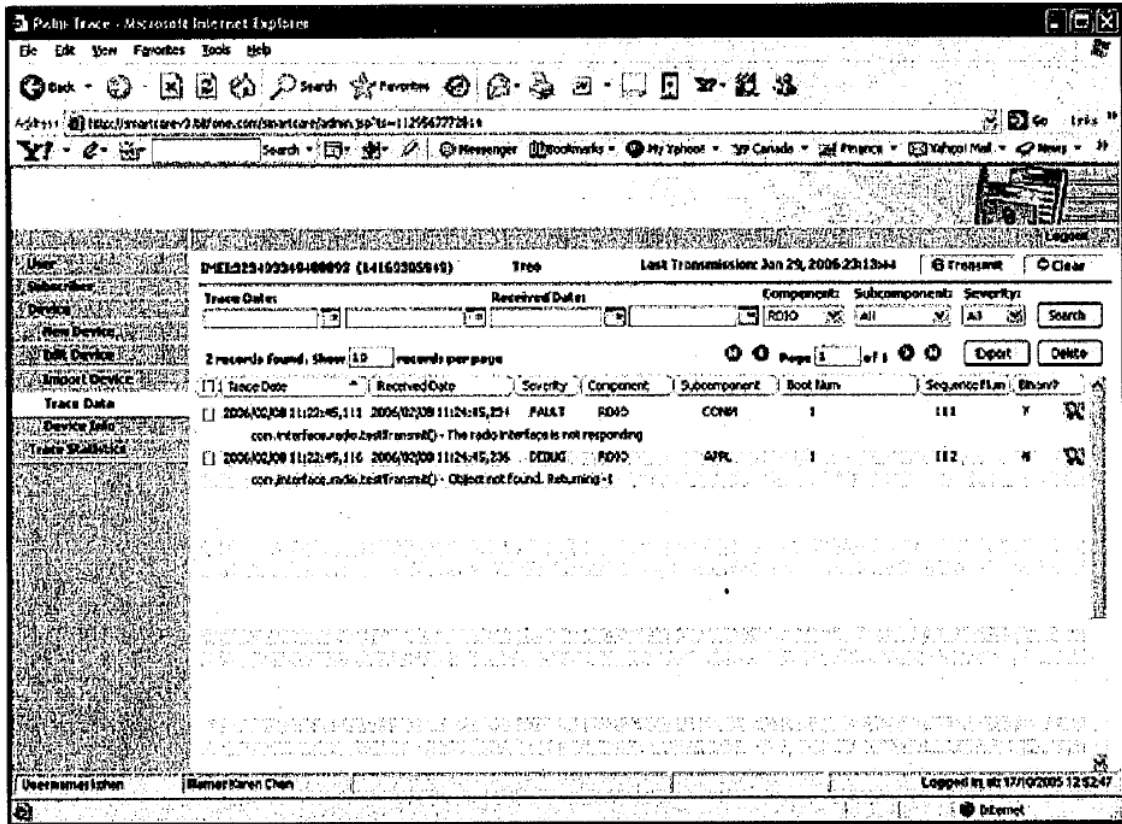
the mobile device, thereby facilitating efficient technical support and maintenance operations.

95. The client software generates and collects diagnostics, tracing, debugging, and network performance information on the mobile device. EX1009, [0039]-[0042]. This comprehensive data collection encompasses multiple data types—diagnostics capture system health metrics, tracing records execution sequences, debugging information identifies software issues, and network performance data measures connectivity quality. A POSITA would have understood that these diverse data types provide a holistic view of the mobile device's operational state and enable precise problem identification.

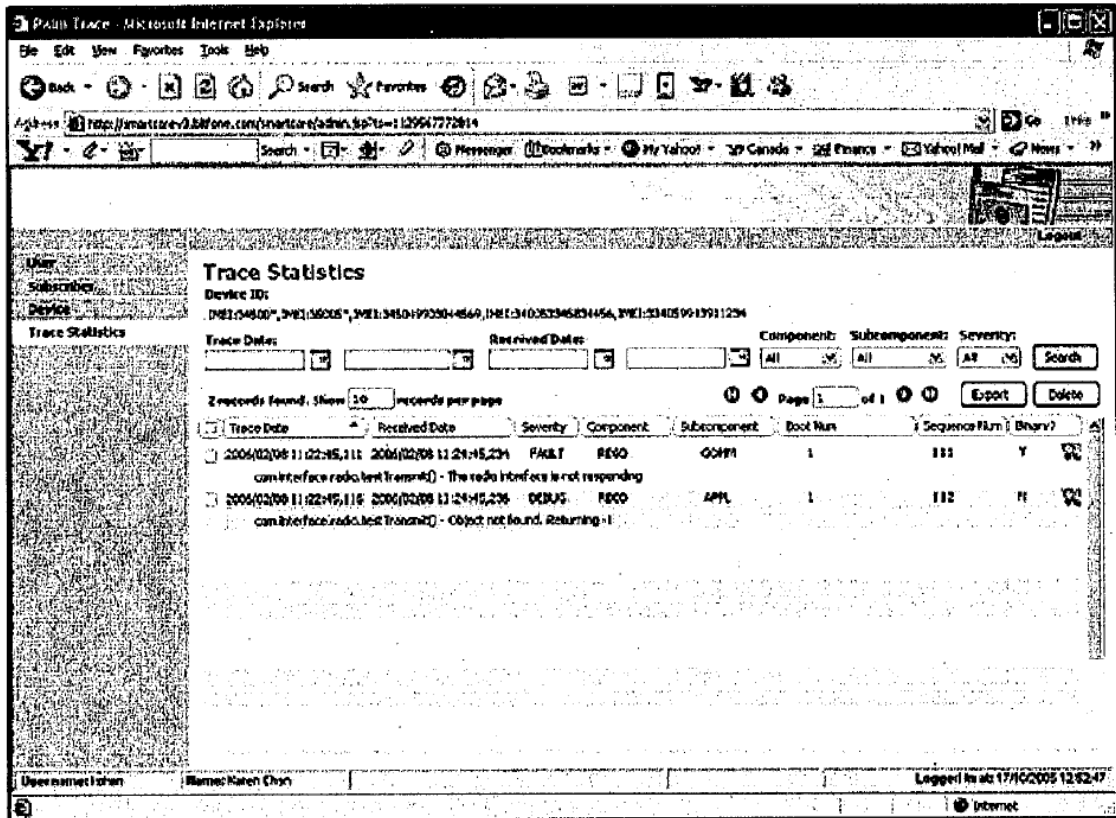
96. Furthermore, this information is then uploaded to the server components where it is stored in a database and made available to the network operator and mobile device user. EX1009, [0044], [0059], [0072], [0202], [0215], [0242], [0249], [0252], [0273]-[0274], Fig. 14. Providing access to both operators and users implements a dual-access model that supports both professional troubleshooting and user self-service scenarios. Therefore, Daley's architecture creates a complete diagnostic ecosystem that transforms raw device data into actionable operational intelligence.



97. This information is made available through a web page. EX1009, Figs. 15, 16, 17, 18.



98. The network operator may analyze the collected information in aggregate to gather statistics across multiple mobile devices. EX1009, [0286]-[0290], Fig. 17. In my opinion, this aggregated analysis capability represents a critical advancement beyond single-device monitoring, enabling network-wide performance optimization and systematic issue detection.



6. Scherzer

99. U.S. Patent Application Publication 2008/0186882 (“Scherzer”) is prior art under at least pre-AIA 35 U.S.C. § 102(a) and (e), having been filed May 3, 2007 and published August 7, 2008, and thus published before the earliest effective filing date of the ’925 Patent.

100. Scherzer discloses a system for collecting measurements of quality for access points from devices into a database that is then shared with devices to facilitate those devices connecting to preferred access points based on those measurements. EX1011, Abstract. This bidirectional information system creates a crowd-sourced network database that benefits all participating devices through

shared quality measurements. This system includes client devices such as cellphones communicating with a server to update and query a database containing measurements of quality and the geographic location of wireless access points. EX1011, [0068], Fig. 1. A POSITA would have recognized that this architecture implements a collaborative quality assessment framework where each device both contributes to and benefits from the collective network knowledge.

101. Scherzer's database "stores historical data about radio broadband access resources" including "WiFi hot-spots locations and quality." EX1011, [0067]-[0068]. The server populates the database based on "connectivity reports" received from client devices. EX1011, [0069]. First, when client devices are connected to access points, they measure the quality of the connection and report those measured parameters to the server to update the database. EX1011, [0071]. This real-time quality reporting captures actual user experience during active connections, providing empirical performance data under realistic usage conditions. Second, client devices conduct radio surveys of the available radio resources available at the client's geographic area, and for each radio resource, the client performs a "measurement trip" to collect "radio resource parameters." EX1011, [0080]-[0082]. A POSITA would have understood that these measurements systematically characterize the radio environment by evaluating signal characteristics of both connected and non-connected access points.

102. Scherzer's client devices receive the quality and connection information from the server's database. EX1011, [0071]. This information distribution transforms individual device experiences into collective network intelligence accessible to all participating devices. A client device uses the information as part of its process for selecting and connecting to a wireless access point within its geographic location. EX1011, [0070]-[0071]. Through this informed selection process, devices can preemptively identify optimal access points before attempting connections, thereby reducing connection failures and improving overall user experience.

103. Additionally, Scherzer describes the server using the information in the database to provide geographic maps of access points near a client device. EX1011, [0149]. These visual representations enable users to understand the spatial distribution of connectivity options in their vicinity. The server may provide a ranking of those access points based on the database's measurements of the quality of the access point. EX1011, [0149]-[0151]. A POSITA would have recognized that this ranking system applies quantitative quality metrics to generate prioritized connection recommendations, enabling devices to systematically select the highest-performing access point from available options. Thus, Scherzer's comprehensive system transforms distributed quality measurements into actionable connection intelligence that optimizes wireless network utilization.

B. Ground 1: Dawson, Geranio (Claims 1-10, 12, 13, 17-19)

1. Combination

104. The combination includes Dawson's system for organizing sales related information related to telecommunication assets and property modified, according to the teachings of Geranio's real estate clearinghouse, to include transactional features such as setting and exchanging business terms and executing contracts.

105. Dawson and Geranio are both directed to databases and search engines for real properties (EX1013, [0019]; EX1038, [0013]), and they share a common goal: matching properties with buyers and facilitating transactions (EX1013, [0021]-[0023]; EX1038, [0013], [0029]).

2. Motivations to Combine

106. In my opinion, a POSITA would have been motivated to apply Geranio's teachings of detailed transactional features to Dawson's integrated system for organizing and facilitating sales activities of telecommunications assets. Dawson's system supports assessing properties as potential sites for infrastructure. EX1013, [0019], [0024], [0032], Fig. 7. After assessing properties, the logical next step is procuring rights to those properties, that is, sales of those properties—what Dawson's system is organized for (EX1013, [0007], [0009]). Dawson discloses that property rights can be secured by, e.g., personnel in the real estate group, and a lease record is created afterwards and linked to the site. EX1013, [0025]. The lease

records and other sales activities are stored in the system to support commission tracking. EX1013, [0009], [0025].

107. In my opinion, the design of Dawson's clearinghouse created opportunities to include more comprehensive and transactional functionalities such as negotiation, document exchange, and contract execution, etc., to generate and track these lease and sales records. A POSITA would have understood doing so creates a more comprehensive repository that facilitates Dawson's commission tracking capabilities and confers additional benefits such as streamlining the procurement process, reducing the need for data transfer, and improving transparency and efficiency for all parties.

108. In my opinion, Geranio is one example that teaches the kinds of information a POSITA would consider incorporating into Dawson's clearinghouse. For example, Geranio's system can "generate a purchase opportunity letter 90, a sale opportunity letter, and an investment opportunity letter 94." EX1038, [0043]. The purchase opportunity letter 90 "describes the property, the sales price 28, the terms of the sale, and any other information of interest" and "is transmitted to the buyer 12." *Id.* Similarly, the sale opportunity letter and the investment opportunity letter include proposed business terms and are transmitted to the seller and the investor, respectively. *Id.* Geranio teaches that "the buyer 12, seller 14, and/or investor 16 may transmit an acceptance 96 indicating that they would like to proceed with the

deal” through the system. EX1038, [0044]. The acceptance may be accompanied by or conditioned upon “other terms to be negotiated.” *Id.*

109. Geranio also teaches facilitation of negotiation and contract formation. EX1038, [0045], Fig. 5. “[T]he buyer 12, seller 14, and/or investor 16 may transmit an acceptance 96 indicating that they would like to proceed with the deal.” *Id.* The parties “may meet and form a legally binding agreement using an escrow arrangement known in the art” or terms may be “negotiated by the appropriate professionals” and “an agreement could be executed.” *Id.* Geranio’s system “could be used to form a legally binding agreement using electronic signatures and form papers or electronic forms to complete all of the legally required terms of the deal.” *Id.*

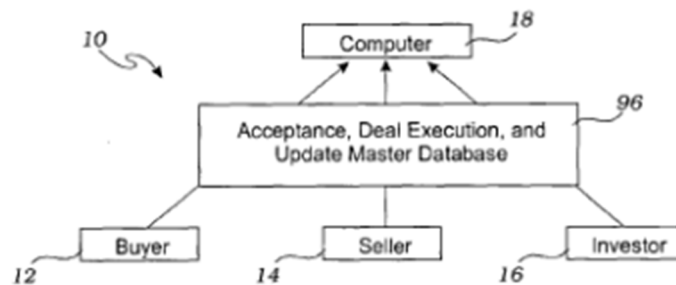


Fig. 5

EX1038, Fig. 5.

110. In my opinion, a POSITA would have been motivated to incorporate the above transactional features taught by Geranio, such as offer, acceptance, and contract formation into Dawson’s online clearinghouse as these elements are

fundamental to facilitate, authenticate, consummate, and record transactions between parties.

3. Reasonable Expectation of Success

111. In my opinion, a POSITA would have had a reasonable expectation of success in modifying Dawson to include the transactional features taught by Geranio. Dawson's system is already integrated with search, updating, and communication protocols and interfaces. EX1013, [0019]-[0022], [0029]-[0030], [0034]. Dawson opens access to transactional supporting personnel such as real estate agents and implements functionalities such as linking lease records and tracking commissions. EX1013, [0023]-[0025], [0030]; Adding additional transactional support such as business terms, negotiations, financing options, contract formation from Geranio to Dawson would only involve standard database extensions, interface modifications, and programs bridging these functional modules, all of which were well established techniques.

4. Analysis

(a) Claim 1

(i) 1[pre] A clearinghouse system for communications networks, comprising:

112. Assuming the preamble is limiting, the combination renders obvious *a clearinghouse for communications networks*. In my opinion, Dawson discloses a

clearinghouse that addresses the complex coordination challenges inherent in telecommunications infrastructure procurement and deployment.

113. Dawson discloses “methods and systems for managing information relating to a fixed wireless service provider.” EX1013, [0018]. In particular, it provides information on properties, including legal and technical details, that may be used by wireless service providers to ascertain whether rights to a property can be obtained and network infrastructure such as an antenna can be deployed on that property. EX1013, [0023]-[0024].

114. Dawson’s system aggregates diverse information types—legal rights, technical feasibility assessments, and business terms—into a unified transactional platform. This integration transforms traditionally fragmented procurement processes into streamlined workflows where stakeholders can evaluate opportunities, negotiate terms, and execute agreements through a single system. Therefore, Dawson’s database system establishes a comprehensive *clearinghouse* that facilitates all aspects of *communications networks* infrastructure procurement and deployment.

(ii) 1[a] one or more computers which interface with a database, said database including

115. The combination renders obvious this limitation. In my opinion, Dawson discloses a *database* server 820 for organizing sales activities and a webserver 830 (*computer*) that *interfaces with the database* server 820. EX1013,

[0033]. A POSITA would have known that the database server 820 houses (e.g., in preferred embodiments, the storage devices are physically located in it) and manages Dawson's *database* that captures information relating to "all aspects of the [wireless services] business." EX1013, [0019], [0033]. Further, a POSITA would have known that the webserver 830 hosts, processes, and delivers content to a user's web browser over the Internet.

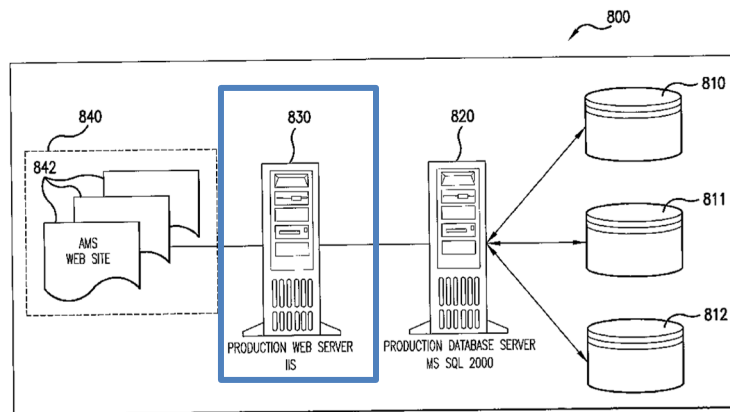


FIG. 8

EX1013, Fig. 8 (annotated).

- (iii) **1[a][i] records for one or more telecommunications carriers which identify infrastructure needs for one or more telecommunications carriers in terms of one or more of (i) types of equipment and performance characteristics for said types of equipment, (ii) location information including one or more of geographical areas, and (iii) desired business terms for said infrastructure needs, and**

116. The combination renders obvious this limitation. In my opinion, Dawson discloses the claimed database records.

117. Dawson teaches an integrated database that organizes “the information necessary for an enterprise offering wireless services” including “information pertaining to portfolios of roof rights” that “can be obtained by the wireless service provider...” EX1013, [0019]. “Roof rights” refers to “a legal right to install a wireless infrastructure, which is typically, but not necessarily, installed on the roof a building.” *Id.* The information regarding roof rights that can be obtained are *records for one or more telecommunications carriers which identify infrastructure needs for one or more telecommunications carriers*, where the *infrastructure need* is for installation of a wireless infrastructure such as an antenna at a particular location.

118. In my opinion, this claim limitation recites three disjunctive elements (i)-(iii) and only one of the three is required to satisfy the limitation. Dawson discloses or renders obvious identifying those infrastructure needs *in terms of one or more of* elements *(ii) location information including one or more of geographical areas* and thereby satisfies this limitation. Specifically, Dawson’s database includes “roof rights that can be obtained by the wireless service provider” (EX1013, [0019]) and the “address” of the location at issue (EX1013, [0024]).

- (iv) **1[a][iii] records of a plurality of end users which identify one or more of (i) telecommunications assets owned or controlled by said end users including geographic location and type of available or existing telecommunications assets (ii) property assets owned or controlled by said**

end users including geographic location, and (iii) desired business terms or preferences for use of said telecommunications assets or said property assets;

119. The combination renders obvious this limitation. In my opinion, Dawson discloses the claimed database records.

120. Dawson teaches that a (potential) wireless customer may perform actions to initiate or facilitate the property procurement process such as entering its site on the Market List or granting legal rights. EX1013, [0034]. A POSITA would have understood that Dawson's database includes *records of a plurality of end users* (e.g., site records associated with properties owned or controlled by a wireless customer).

121. In my opinion, this claim limitation recites three disjunctive elements (i)-(iii) and only one of the three is required to satisfy the limitation. Nonetheless, the combination renders obvious that these *records... identify one or more of* all three recited characteristics.

122. With respect to this limitation's element (i), Dawson's database includes "roof rights that can be obtained by the wireless service provider, commissions, inventories and locations of wireless infrastructure equipment, engineering data, leases, contacts, and other types of information." EX1013, [0019]. A POSITA would understand that this includes *geographic location* ("locations") *and type of available or existing telecommunications assets* ("inventories").

123. With respect to elements (ii) and (iii), Dawson's records include "a site address field 20" (*geographic location of the property assets*) and "permit requirements for the site, and/or, if known, the cost of obtaining roof rights" (*desired business terms or preferences*). EX1013, [0023]-[0024]. Dawson details that its records undergo an evaluation on "real estate friendliness," which is performed on "whether legal rights have or can be obtained for a site at a reasonable cost, and under reasonable terms and conditions" (*desired business terms*). EX1013, [0023], Fig. 1. The "real estate friendliness" can be determined by means of "input 114 from users in a real estate group, who are responsible for carrying out negotiations with the landlord of the site." *Id.* A POSITA would have understood that such negotiations would involve *desired business terms* of the property owners (*end users*), which are reflected in Dawson's records.

124. Additionally, in my opinion, Geranio's property for sale database 22 further supplements element (iii) with "terms of the sale 32" (*desired business terms*). EX1038, [0029]. In the combination, the database would include this information.

- (v) **1[b] one or more electronic interfaces to said one or more computers which permit one or more telecommunications carriers and one or more end users to selectively view or catalog information about (a) available telecommunications assets or properties and locations thereof, (b) the owners or tenants of said available telecommunications assets or**

properties, (c) infrastructure needs of one or more telecommunications carriers, and (d) proposed business terms for fulfilling said infrastructure needs with said telecommunications assets or said property assets,

125. The combination renders obvious this limitation. In my opinion, Dawson discloses viewing or cataloging information with respect to the recited records by telecommunications carriers and end users.

126. Dawson discloses a webserver 830 that is connected to computer 18 and provides HTTP and TCP/IP based interfaces “for providing various web pages 780” to the users, including both wireless service providers (*telecommunications carriers*) and customers (*end users*), so that they can view and interact with the system and its content (*electronic interfaces to said one or more computers which permit one or more telecommunications carriers and one or more end users to selectively view or catalog information*). EX1013, [0024], [0031]-[0033], Figs. 2, 5, 7, 8. For example, a wireless service provider (*telecommunications carrier*) can *selectively view* list of sites for “real estate friendliness” and the possibility to “provide a serviceable signal.” EX1013, [0028]. The sites may be *catalog[ed]* as “On Net,” “Target,” “Coverage Optimization,” or “Reject.” EX1013, [0031]. Further, Dawson specifically contemplates that some of these steps may be performed by the customers (*end users*). EX1013, [0034].

127. In my opinion, this claim limitation recites four disjunctive elements (a)-(d) and only one of the four is required to satisfy the limitation. Nonetheless, the information includes *information about* all four elements (a)-(d).

128. With respect to element (a), Dawson discloses that the web page allows users to see a list of *properties* with site address (*locations*) and status (e.g., “Target”). EX1013, [0031], Fig. 5. A POSITA would have understood that at least those *properties* classified as “Target” are *available* from the perspective of a telecommunications carrier. *Id.*

500

Site Id	Market Site Name	Address	City	State	Base Station	Tenants	Promo	AE	RSM	Status	Customers
246	101 E Renner Rd	101 E Renner Rd	Richardson	TX	US DATA	26		cleonard	jmaynard	Target	Customers
485	10501 N Central Expy	10501 N Central Expy	Dallas	TX	KTVI	24		cleonard	jmaynard	Target	Customers
961	Summit Square Bus. Cntr	1100 Summit Ave	Piano	TX	US DATA	8	SNIPER	cleonard	jmaynard	Target	Customers
974	1101 E Plano Pkwy	1101 E Plano Pkwy	Piano	TX	US DATA	5		cleonard	jmaynard	Target	Customers
1415	11441 N Stemmons Fwy	11441 N Stemmons Fwy	Dallas	TX	GREYSTONE	16		cleonard	jmaynard	Target	Customers
2441	1350 E Arapaho Rd	1350 E Arapaho Rd	Richardson	TX	US DATA	9		cleonard	jmaynard	Target	Customers
3136	One Signature Place	14755 Preston Rd	Dallas	TX	SW BELL	33	SNIPER	cleonard	jmaynard	Target	Customers
3142	Two Signature Place	14785 Preston Rd	Dallas	TX	SW BELL	56		cleonard	jmaynard	Target	Customers
3184	14902 Preston Rd	14902 Preston Rd	Dallas	TX	SW BELL	52		cleonard	jmaynard	Target	Customers
4108	1771 International Pkwy	1771 International Pkwy	Richardson	TX	US DATA	13	SNIPER	cleonard	jmaynard	Target	Customers
25958	2611 Westgrove Dr	2611 Westgrove Dr	Carrollton	TX	SW BELL	5		cleonard	jmaynard	Target	Customers
6709	Citiplace	2711 N Haskell Ave	Dallas	TX	CITIPACE	59		cleonard	jmaynard	Target	Customers
6896	2775 Villa Creek Dr	2775 Villa Creek Dr	Dallas	TX	GREYSTONE	9		cleonard	jmaynard	Target	Customers
18561	3068 Forest Ln	3068 Forest Ln	Dallas	TX	GREYSTONE	21		cleonard	jmaynard	Target	Customers
8340	3410 Midcourt Rd	3410 Midcourt Rd	Carrollton	TX	SW BELL	11		cleonard	jmaynard	Target	Customers
14934	4004 Belt Line Rd	4004 Belt Line Rd	Addison	TX	SW BELL	22		cleonard	jmaynard	Target	Customers
10428	4801 Keller Springs Rd	4801 Keller Springs Rd	Addison	TX	SW BELL	17		cleonard	jmaynard	Target	Customers
32721	Liberty Plaza I	5055 Keller Springs Rd	Addison	TX	SW BELL	7		cleonard	jmaynard	Target	Customers
27717	5310 Harvest Hill Rd	5310 Harvest Hill Rd	Dallas	TX	OXY	47		cleonard	jmaynard	Target	Customers
12212	6330 LBJ Fwy	6330 LBJ Fwy	Dallas	TX	OXY	10		cleonard	jmaynard	Target	Customers
13449	801 E Plano Pkwy	801 E Plano Pkwy	Piano	TX	US DATA	10		cleonard	jmaynard	Target	Customers
28946	9603 White Rock Trl	9603 White Rock Trl	Dallas	TX	KTVI	4		cleonard	jmaynard	Target	Customers
Total						464					

FIG.5

EX1013, Fig. 5.

129. With respect to element (b), Dawson teaches property information including “a field 208 indicating the number of *tenants*, and a sales volume field

210” or other “[n]otes pertaining to real estate aspects of the site, such as the name of the landlord (***owner***) and/or management company for the site.” EX1013, [0024], Fig. 2.

130. With respect to this limitation’s element (c), Dawson’s database discloses “roof rights” a wireless service provider may acquire for service provision or expansion. EX1013, [0019], [0024]-[0031]. The wireless service provider can review information such as “inventories and locations of wireless infrastructure equipment” (including, e.g., base stations at or near the site), EX1013, [0031]-[0032]) and use signal coverage and mapping/terrain tools to determine whether wireless infrastructure at particular locations can provide the needed service coverage. EX1013, [0026]-[0027], Figs. 1, 3, 5. A POSITA would also have understood that such roof rights and associated records are information about ***infrastructure needs of one or more telecommunications carriers***.

131. Lastly, with respect to element (d), Dawson discloses property information including “[n]otes pertaining to real estate aspects of the site, such as the name of the landlord and/or management company for the site, permit requirements for the site, and/or, if known, the cost of obtaining roof right” (***proposed business terms for fulfilling said infrastructure needs***). EX1013, [0024], Fig. 2.

132. In addition, as discussed in limitations 1[a][i] and 1[a][ii], *supra*, Geranio's discloses ***proposed business terms*** associated with a property that can be selectively viewed or cataloged. In my opinion, the combination would include this information.

(vi) **1[c] wherein notification is provided to either or both: one or more of the owners or tenants of said available telecommunications assets or properties; and the one or more telecommunications carriers;**

133. The combination renders obvious this limitation. In my opinion, this limitation is satisfied when the claimed notification is provided to either of the recited parties. Nonetheless, Geranio discloses providing the claimed notification to both the seller (***one or more of the owners of said available telecommunication assets or properties***) and the buyer (***one or more telecommunications carriers***).

134. Geranio teaches that, when a buyer inquires the system on properties with desired characteristics, "[t]he search means 86 will immediately: locate a buyer 12 for the property; find a property for the seller 14 to buy; and/or match financing with a potential deal." EX1038, [0079]. Further, "[t]he information will be immediately dispatched (***notification is provided***) to the buyer 12 (***one or more telecommunications carriers***)/seller 14 (***one or more of the owners ... of said available telecommunications assets or properties***)/investor 16 via mail, fax, email,

and/or by phone (or other suitable means) to arrange signatures on a listing agreement, a sales agreement, and an investment agreement.” *Id.*

(vii) 1[d] when suitable available telecommunications assets or properties for said infrastructure needs of said one or more telecommunications carriers at one or more locations are identified.

135. The combination renders obvious this limitation. In my opinion, Geranio discloses the claimed condition for providing the notification.

136. As discussed above, in this combination, Geranio teaches providing notifications to the buyer 12 and the seller 14 when the system “locate[s] a buyer 12 for the property; find[s] a property for the seller 14 to buy; and/or match[es] financing with a potential deal” (*when suitable available telecommunications assets or properties for said infrastructure needs of said one or more telecommunications carriers at one or more locations are identified*). EX1038, [0079].

(b) Claim 2. The clearinghouse system of claim 1 wherein said database includes public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic locations, and information about carriers serving said geographic locations.

137. The combination renders obvious this claim. In my opinion, the claim limitation recites five disjunctive characteristics (mapping information, zoning

information, local ordinances, contract information for government officials, and information about carriers) of the claimed public records and only one of the five is required for satisfying the limitation. Dawson discloses the claimed public records that satisfy two of the five recited characteristics (*mapping information* and *information about carriers*).

138. Dawson's property records include "a site identification field 204, a site address field 206" (*public records which include, for a plurality of geographic locations*). EX1013, [0024]. Dawson further incorporates maps or mapping information from "a MapInfo spatially-enabled terrain database" including "photographs and terrain information for the desired area" (*maps, ..., or mapping information for said geographic locations*). EX1013, [0026], Fig. 3. Dawson's "screen output 300 includes color coded representations of a coverage area 312" that signifies whether a location "is serviceable by the wireless service provider's network" (*information about carriers serving said geographic locations*). *Id.*

- (c) **Claim 3. The clearinghouse system of claim 1 wherein said one or more electronic interfaces permits one or more public users, who are not telecommunications carriers or end users, to selectively view or catalog information about said available telecommunications assets or properties and locations thereof, and said infrastructure needs of one or more telecommunications carriers for one or more locations.**

139. The combination renders obvious this claim. In my opinion, the technical teachings of Dawson and Geranio collectively render obvious the claimed viewing or cataloging of information by a public user.

140. In my opinion, a POSITA would have understood that the combination renders obvious third party (*one or more public users, who are not telecommunications carriers or end users*) access to its system in multiple ways.

141. A POSITA would have known that it is common in the telecommunications industry for independent property owners, such as landlords of buildings, to install and maintain telecommunications infrastructure such as base stations and antenna systems on their properties and lease access to multiple carriers. In big metropolitan areas like New York city, hosting and leasing antennae to telecommunication carriers could be a lucrative revenue source. EX1039.

142. Further, a POSITA would have known that specialized management firms, such as American Tower (publicly traded on NYSE), aggregated portfolios of such infrastructure and manage the search/negotiation/lease processes between the

property owners and the carriers. EX1040, 10-15. This business model reduced redundant equipment on rooftops, simplified maintenance, and made economic sense for both property owners and carriers. EX1040, 10-12.

143. A POSITA would have thus been motivated to allow these independent property owners and brokerage firms (*one or more public users*) access to Dawson's system to facilitate the procurement process. A POSITA would have also understood that because Dawson is designed to allow a wireless service provider to enter an address and search for properties and infrastructure deployment and a customer to enter a property location and search for wireless services, the system is ready to be configured to allow these third parties to search and identify (*selectively view or catalog*) property and infrastructure needs.

144. In addition, management firms like American Tower also invested in infrastructure and property. EX1040, 10-15. Accordingly, they would also be interested in searching and identifying properties in Dawson's system as investors and a POSITA would be motivated to accommodate them with investor specific functionalities such as those taught by Geranio. Specifically, Geranio teaches that such investors can access the clearinghouse system and facilitate the transactions by, e.g., *view[ing] or catalog[ing] information about the properties* and financing the purchases. EX1038, [0028], [0043], [0082], Figs. 1, 4, 5.

145. Further, as discussed above regarding the stored records and functionalities of the Dawon system, a POSITA would have known that, when accessing the system, these public users would *selectively view or catalog information about said available telecommunications assets or properties and locations thereof, and said infrastructure needs of one or more telecommunications carriers for one or more locations.*

- (d) **Claim 4. The clearinghouse system of claim 1 wherein said one or more electronic interfaces includes one or more of an Internet interface, a telephone, a speech, handwriting or fingerprint recognition device, electronic mail interface, a facsimile, voicemail, a webserver, a wireless or portable computing or communications device, VoIP, or a digital recorder.**

146. The combination renders obvious claim 4. *See* limitation 1[b] *supra*, Dawson discloses a web interface, which, in my opinion, serves as an *Internet interface* and is supported by a *webserver*.

- (e) **Claim 5. The clearinghouse system of claim 1 wherein at least one of said one or more electronic interfaces is connected to the world wide web, and wherein said records for one or more telecommunications carriers and said records for a plurality of end users can be viewed using a browser and can be retrieved by a web crawler.**

147. The combination renders obvious claim 5. *See* claim 4 *supra*, Dawson discloses a web interface, which, in my opinion, is connected to the *world wide web* and the records can be viewed using a *browser*.

(f) Claim 6. The clearinghouse system of claim 1 further comprising a security application which protects the identity and infrastructure needs of said one or more telecommunications carriers.

148. The combination renders obvious this claim. In my opinion, Dawson discloses the claimed security application.

149. Dawson's database requires "users to log on to the system and provide a password" (*security application*) such that the system "can track input to the system by user." EX1013, [0023]. Dawson further teaches that "the home page requires the sales group user to log in, both to protect the confidentiality of the sales data and to allow the system to track actions performed by each user." EX1013, [0030]. A POSITA would have understood that the use of log-on/password (*security application*) protects user data including the *identity and infrastructure needs of said one or more telecommunications carriers*.

(g) Claim 7. The clearinghouse system of claim 1 further comprising a security application and billing application which permits charging said one or more telecommunications carriers or said one or more end users at selectable rates for use of said clearinghouse system.

150. The combination renders obvious this claim. In my opinion, Dawson discloses or renders obvious the claimed security application and billing application.

151. Dawson discloses that a user, such as real estate agent, can log on with a password and the user's activities are tracked for sales transactions and billing and

crediting commissions (*security application and billing application*). EX1013, [0025]. A POSITA would have understood it is standard practice to require a similar security application for all Dawson's users including *telecommunication carriers* and *end users*. A POSITA would have understood it is also standard practice for a commercial system like Dawson's to charge its users subscription or usage fees (*selectable rates for use of said clearinghouse system*). For example, Dawson teaches the use of commercial software deciBel Planner (by Marconi Corporation) and MapInfo (by MapInfo Corporation) (EX1013, [0026]-[0027]), which were known by a POSITA to charge subscription or service fees. *See, e.g.*, EX1041; EX1042, 19, 22. A POSITA would have known that such user fees would be passed to Dawson's users in some form.

- (h) **Claim 8. The clearinghouse system of claim 1 further comprising a communications application which permits secure negotiation and acceptance of business and legal terms between one or more telecommunications carriers and one or more end users for use of said one or more telecommunications assets or one or more property assets.**

152. The combination renders obvious claim 8. In my opinion, the combination renders obvious the claimed communications application.

153. A POSITA would have known that the combination includes Geranio's *communications application*. Geranio's teaches that its clearinghouse can "generate a purchase opportunity letter 90, a sale opportunity letter, and an

investment opportunity letter 94” and supports the transmission of the same.

EX1038, [0043]-[0045], Fig. 5. The system also facilitates the negotiation process, during which “the buyer 12, seller 14, and/or investor 16 may transmit an acceptance 96 indicating that they would like to proceed with the deal.” *Id.* Additionally, the clearinghouse “could be used to form a legally binding agreement using electronic signatures and form papers or electronic forms to complete all of the legally required terms of the deal.” *Id.*

154. As to the system being *secure*, see claim 6 *supra*, Dawson teaches user accounts and passwords and a POSITA would have understood that the combination would employ the same. A POSITA would also have known that, for online transactional systems like Dawson and Geranio, password protections and other electronic authentication and security measures were standard practices. See e.g., EX1043, 10-15.

(i) Claim 9. The clearinghouse system of claim 8 wherein said property assets are selected from a building, a roof top, a billboard, a tower, and a lot or acreage.

155. The combination renders obvious claim 9. In my opinion, Dawson discloses the claimed property asset types.

156. Dawson discloses *property assets are selected from a building, a roof top, a billboard, a tower, and a lot or acreage*. EX1013, [0019] (“roof rights”), [0026]-[0027] (“building”), Fig. 3.

(j) Claim 10. The clearinghouse system of claim 1 wherein said database includes performance or quality of service information for specific locations.

157. The combination renders obvious claim 10. In my opinion, Dawson discloses the claimed records in its database.

158. Dawson discloses its database including metrics such as radio coverage and signal strength of a specific site (*performance or quality of service information for specific locations*) for determining whether a serviceable signal can be supplied to the site. EX1013, [0026]-[0027], Fig. 3.

(k) Claim 12. The clearinghouse system of claim 10 wherein said one or more electronic interfaces provides performance or quality of service information to one or more mobile or land devices that is located in or will be located in said specific locations.

159. The combination renders obvious claim 12. In my opinion, Dawson renders obvious the claimed provision of information.

160. Dawson is directed to facilitating wireless service providers' deployment of wireless infrastructure and expansion of wireless network services to customers. EX1013, [0028], [0031]. Dawson teaches prioritizing expansion to "most promising potential customers," which may be ascertained by "mass-mailed advertisements from potential customers, sales leads, the fact that a site not currently being served by the wireless service provider is owned and/or operated by the same owner as another site to which services are provided." EX1013, [0020]-

[0021]. Dawson inquires about real-estate and engineering feasibilities in determining whether to obtain roof rights and/or deploy network infrastructure, e.g., an antenna. EX1013, [0023]-[0026]. Customers may “initiate the process” and “take other actions” during the process. EX1013, [0034]. Dawson further teaches that the evaluation is a dynamic process and that “potential sites” may be added “as new information becomes available and as the wireless service provider’s network continues to change.” EX1013, [0029].

161. In my opinion, a POSITA would have understood that Dawson’s customers would be interested in receiving service updates. As such, a POSITA would have configured Dawson’s clearinghouse to **provide performance or quality of service information to the customer’s device (one or more mobile or land devices)** at the site (**located in or will be located in said specific locations**). For example, if a customer’s site is classified as “Coverage Optimization,” the site is considered low priority for the wireless service provider because the coverage is not optimal. EX1013, [0031]. However, the customer located there may still want the service and it may be mutually beneficial for both the customer and the wireless service provider to update the service coverage once the site becomes serviceable. For the customer, this would allow new service to be installed. For the wireless service provider, this would secure the prospective customer from its competitors. In many circumstances, the customers are commercial entities, e.g., a

landlord of commercial buildings or shopping centers with numerous tenants, and wireless service provision is not only desirable (for the landlord and its tenants) but also profitable (for the wireless service provider and the landlord), and both the customer and the wireless service provider would be incentivized to receive service updates. *See, e.g.,* EX1044. Indeed, Dawson specifically contemplates service expansion for commercial landlords who are existing customers at one location but not another. EX1013, [0021] (identifying a site based on “the fact that a site not currently being served by the wireless service provider is owned and/or operated by the same owner as another site to which services are provided”).

(I) Claim 13. The clearinghouse system of claim 10 wherein said performance or quality of service information includes multiple bands and multiple carriers.

162. The combination renders obvious claim 13. In my opinion, Dawson discloses or renders obvious the claimed records.

163. Dawson discloses estimation of radio coverage and signal strength (*performance or quality of service information*) using the deciBel Planner with MapInfo software. EX1013, [0026]. A POSITA would have known that the deciBel Planner supported *multiple bands and multiple carriers*, such as CDMA, UMTS, fixed wireless and paging technologies. EX1041.

(m) Claim 17. The clearinghouse system of claim 1 further comprising a computation application, which interfaces with at least one of said one or more computers, and which identifies optimum or prioritized locations for said infrastructure needs based on said records of said plurality of end users.

164. The combination renders obvious claim 17. In my opinion, Dawson discloses the claimed computation application.

165. Dawson discloses making “a determination as to whether a serviceable signal can be provided to the site is made.” EX1013, [0026], Figs. 1, 3. Dawson also teaches that sites in its database that have serviceable signals may be “classified as priority sites” (*optimum or prioritized locations for said infrastructure needs based on said records of said plurality of end users*). EX1013, [0023]-[0030], Figs. 1-3.

166. Further, a POSITA would have known that the coverage estimation application communicates with Dawson’s webserver 830 (*computation application, which interfaces with at least one of said one or more computers*), because application output 300 is presented as a webpage that can be viewed from a web browser. EX1013, Fig. 3.

- (n) **Claim 18. The clearinghouse system of claim 2 further comprising a computation application, which interfaces with at least one of said one or more computers, and which identifies optimum or prioritized locations for said infrastructure needs based on both said records of said plurality of end users and said public records.**

167. The combination renders obvious claim 18. *See* claims 2 and 17, *supra.*, a POSITA would have known that the coverage estimation uses both site information pertaining to customers and public records such as location and map information (*both said records of said plurality of end users and said public records*).

- (o) **Claim 19. The clearinghouse system of claim 1 further comprising an application program for forming binding agreements between at least one of said one or more telecommunications carriers and at least one of said plurality of end users.**

168. The combination renders obvious claim 19. *See* claim 8 *supra.* In my opinion, in the combination, Geranio teaches *forming binding agreements*.

C. Ground 2: Dawson, Geranio, and Aaron (11, 20, 22, 25, 26)

1. Combination

169. This combination includes Dawson's clearinghouse modified by Aaron's teachings on geographic location tracking and quality of service maps using mobile devices to: 1) expand wireless services to include mobile wireless services; 2) modify Dawson's use of GPS to record location coordinates to also include Aaron's location calculation methods using GPS and base stations; and 3) modify

Dawson's software estimation of radio coverage to also include Aaron's quality of service maps and updates based on information collected from mobile devices at particular geographic locations.

2. Motivation to Combine

170. In my opinion, a POSITA would have understood that, although Dawson observes that fixed and mobile wireless networks have different requirements (EX1013, [0005]), Dawson's disclosures are not limited to one or the other. A POSITA would have understood that many of the issues and solutions presented in Dawson are applicable to both mobile and fixed wireless services. EX1013, [0019] (covering in "broadest sense" the organization of "information necessary for an enterprise offering wireless services"), [0024] (use of base station which implies providing mobile wireless services), [0026]-[0027] (use of deciBel Planner to predict coverage which is common for mobile carriers to design cellular networks), [0031]-[0032] (identification of "base station, or hub, through which the site is connected to the wireless service provider's network"). A POSITA would thus have been motivated to apply Dawson's clearinghouse to mobile wireless services. For example, a POSITA would have known that the same entities, e.g., T-Mobile, often provided both fixed and mobile wireless services and used tools like deciBel to plan their networks, and would have leveraged Dawson's clearinghouse for both services. EX1026; EX1041; EX1045.

171. Further, a POSITA would have been motivated to modify Dawson's clearinghouse to include and reflect the teachings of Aaron to more accurately characterize network coverage and performance for a wireless service provider. Dawson uses software-based estimation of signal strength. EX1013, [0026]-[0027], [0034], Fig. 3. Aaron teaches recording the location and signal strength of mobile devices, using that to create a quality of service map, and continuously monitoring and updating of the quality of service map. EX1010, [0021], [0031]. A POSITA would have known that such user-reported signal strength data provides real-world and real-time measurements across various environments. Supplementing Dawson's database with such data fills in gaps, reduces uncertainties, validates and refines Dawson's predictive model, and provides up-to-date coverage map, and a POSITA would have been motivated to do so to enhance the Dawson system.

3. Reasonable Expectation of Success

172. In my opinion, a POSITA would have had a reasonable expectation of success in adding location and signal strength collection capabilities disclosed by Aaron to Dawson.

173. Enhancement to Dawson's database to collect location and signal strength measurements as disclosed in Aaron and use that to supplement Dawson's software-estimated coverage map would have been straightforward and well within the abilities of a POSITA. Doing so would have involved only adding additional

tables, attributes, relationships, and query routines to the existing databases, and reconfiguring webpages to display signal coverage with the updated data.

174. On the server side, Aaron's system is compatible Dawson's and relevant functionalities can be integrated using known techniques. Aaron discloses a central processor 204 collecting and storing received location and quality of service information, which may be implemented "by one or more devices within the wireless network" or "distributed to some degree." EX1010, [0036], [0037], [0043], Fig. 2. A POSITA would have thus known that the functionalities of the central processor 204 can be incorporated into Dawson's system as a single server or in a distributed fashion.

4. Analysis

- (a) **Claim 11. The clearinghouse system of claim 10 wherein one of said one or more electronic interfaces provides automatic or manual updates of said performance or quality of service information from one or more mobile or fixed devices located in said specific locations.**

175. As discussed in Ground 1 *supra*, Dawson+Geranio renders obvious claim 10. In my opinion, the combination with Aaron further discloses *wherein one of said one or more electronic interfaces provides automatic or manual updates of said performance or quality of service information from one or more mobile or fixed devices located in said specific locations.*

176. Aaron describes mobile devices measuring *quality of service performance* parameters and combining those with the devices' geographic location information. EX1010, Abstract, [0004]-[0005], [0041]. The mobile device monitors such information "periodically or continuously." EX1010, [0004]-[0005]. Transmission of the information to the central database "may occur according to a predetermined schedule (e.g., hourly, daily, etc.) and/or at times when traffic on the wireless communications system is low and/or at times when transmission is otherwise convenient ... [or] based upon an interval since a previous transmission." EX1010, [0008]. Aaron thus discloses updating *quality of service* in the database *automatically* through the *mobile devices*.

177. Also, Aaron's mobile device monitors the quality of service performance and geographic location information "when a user accesses a particular application or service." EX1010, [0004]-[0005]. A POSITA would understand that the user accessing a "particular application or service" is a *manual* step.

(b) Claim 20

(i) 20[pre] A clearinghouse system for communications networks, comprising:

178. See Ground 1, limitation 1[pre].

(ii) 20[a] one or more computers which interface with a database, the database including performance or quality of service information

for one or more specific locations, and one or more of

179. *See* Ground 1, limitation 1[a] and claim 10.

- (iii) **20[a][i] records for one or more telecommunications carriers which identify infrastructure and location information for one or more specific locations,**

180. *See* Ground 1, limitation 1[a][i]. In my opinion, the records identifying infrastructure needs for one or more telecommunications carriers in 1[a][i] (e.g., roof rights) also *identify infrastructure and location information for one or more specific locations.*

- (iv) **20[a][ii] records for one or more end users which identify telecommunications assets or property assets owned or controlled by said one or more end users, and**

181. *See* Ground 1, limitation 1[a][ii].

- (v) **20[a][iii] public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic locations, and information about carriers serving said geographic locations;**

182. *See* Ground 1, claim 2.

- (vi) **20[b] one or more electronic interfaces to said one or more computers which permit performance or quality of service information obtained from one or more mobile or fixed**

devices that are located in one of said one or more specific locations to be automatically or manually updated into said database, and which permits at least one of said one or more telecommunications carriers or said one or more end users or one or more parties which are not telecommunications carriers or end users to review, catalog or sort information in said database; and

183. See Ground 1, limitation 1[b] and claims 3, 11.

(vii) 20[c] one or more applications operable with said one or more mobile or fixed devices or said one or more computers for obtaining and providing said performance or quality of service information to said one or more electronic interfaces.

184. The combination renders obvious this limitation. In my opinion, in the combination, Aaron discloses the claimed application.

185. Aaron details in Fig. 3 that the steps of monitoring and updating quality-of-service performance include measuring service quality (*obtaining said performance or quality of service information*) at Block 310 and transmitting the information (*providing said performance or quality of service information*) to the central processor (*to said one or more electronic interfaces*) at Block 360. EX1010, [0040]-[0041], [0049], Fig. 3. Aaron further teaches that operations of Fig. 3 can be “implemented via software (including firmware, resident software, micro-code, etc.) executing on a wireless terminal 100” (*one or more applications operable with said one or more mobile ... devices*). EX1010, [0038], Fig. 3.

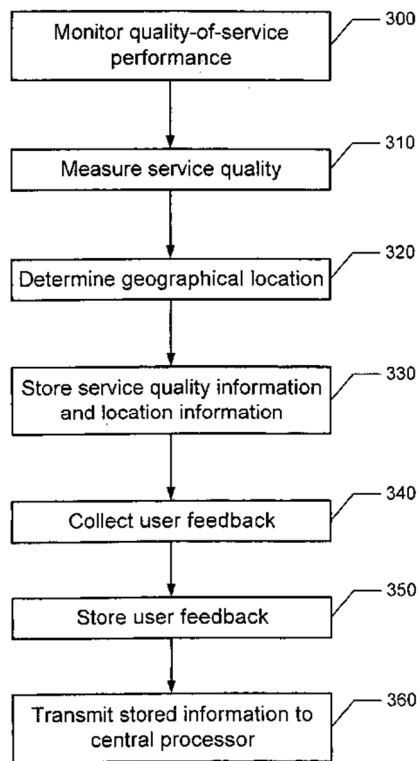


Fig. 3

EX1010, Fig. 3.

- (c) **Claim 22. The clearinghouse system of claim 20 wherein said performance or quality of service information includes multiple bands and multiple carriers.**

186. The combination renders obvious claim 22. *See* Ground 1, claim 13, *supra*.

- (d) **Claim 25. The clearinghouse system of claim 20 further comprising a monitoring application which permits monitoring of radio operating conditions of one or more wireless devices, wherein monitored radio operating conditions are used to update performance or quality of service information in said database.**

187. The combination renders obvious claim 25. In my opinion, in the combination, Aaron discloses the claimed monitoring application.

188. See limitation 20[c], *supra*, Aaron discloses implementing the functionalities of monitoring and updating *performance or quality of service information* “via software (including firmware, resident software, micro-code, etc.) executing on a wireless terminal 100 (*monitoring application*).” EX1010, [0038], Fig. 3. As discussed in claim 26, *infra*, the mobile device may be part of the clearinghouse system.

189. Alternatively, Aaron discloses that the central processor “receives information about quality of service and location information from one or more wireless terminals 100” and “*updates* one or more coverage maps and/or one or more *quality-of-service* maps for a wireless communications system (Block 420).” EX1010, [0052]. A POSITA would have known that the server has counterpart software for receiving and updating *performance or quality of service information* in the database which would also be a *monitoring application*.

- (e) **Claim 26. The clearinghouse system of claim 20 further comprising one or more wireless devices which are configured to provide said performance or quality of service information to one of said one or more of said electronic interfaces.**

190. The combination renders obvious claim 26. In my opinion, in the combination, Aaron discloses the claimed wireless device.

191. *See* claim 20, *supra*, the combination renders obvious claim 26 by including the mobile devices taught by Aaron in the clearinghouse system.

D. Ground 3: Dawson, Geranio, Aaron, and Chmaytelli (14-16, 27-32)

1. Combination, Motivation, and Reasonable Expectation of Success

192. This is the combination of Ground 2, modified according to the teachings of Chmaytelli to include certain ad-related features.

193. In my opinion, a POSITA would have been motivated to combine Chmaytelli with the Dawson+Geranio+Aaron combination. For example, a POSITA would have known, from Chmaytelli and from other references, of industry interest in location-based content, including advertising. EX1028; EX1029; EX1030; EX1031. Advertising was widely recognized as an attractive additional revenue stream or a way to offer services at lower cost. As discussed in Ground 1, claims 3 and 7, *supra*, commercial viability of Dawson's clearinghouse would demand a subscription or use fee and advertising revenue can help subsidize or eliminate subscription fees and promote adoption. Further, location-specific

advertising was understood to be more likely be viewed and to result in conversions.

A POSITA would therefore have recognized the potential value of adding localized ad serving capabilities to the combination of Ground 2, which already collected location information from devices.

194. Further, a POSITA would have had a reasonable expectation of success because Chmaytelli discloses this type of functional integration. EX1012, [0043] (“ad dispatch server 130 can be integrated into server 120, or can be a plurality of separate servers that perform functionally as described”). Combining or supplementing the server in Dawson to include such a local ad server would be a straightforward add-on using known techniques.

2. Analysis

- a) **Claim 14. The clearinghouse system of claim 1 further comprising one or more local ad servers connected to said one or more electronic interfaces, said local ad servers providing localized content to one or more mobile or fixed devices in a specific location.**

195. As discussed in Grounds 1 and 2 *supra*, Dawson+Geranio renders obvious claim 1 and Aaron teaches collecting location of mobile devices. In my opinion, the combination with Chmaytelli renders obvious the additional limitation: *further comprising one or more local ad servers connected to said one or more electronic interfaces, said local ad servers providing localized content to one or more mobile or fixed devices in a specific location.*

196. Chmaytelli discloses a “wireless advertisement (ad) system” configured to serve ads “based on a location of the client device and the geographic area defined in the ad.” EX1012, [0010], [0032], [0041], Fig. 3. Chmatytelli specifically teaches that ads can be delivered to client devices and viewed as web pages. EX1012, [0042] (client device API triggering the device to download “an associated HTML page/document (e.g., advertisement) 334” or ads delivered to the client device as a URL). Thus, a POISTA would have known that, in the combination, with known location of a mobile device, the local ad server would be *connected to* the web interface (*said one or more electronic interfaces*) of the Dawson clearinghouse and *provides localized content to one or more mobile or fixed devices in a specific location*. EX1012, [0043].

b) Claim 15. The clearinghouse system of claim 14 further comprising one or more base stations connected to said one or more electronic interfaces.

197. The combination renders obvious claim 15. In my opinion, in the combination, Aaron teaches the claimed base station.

198. Aaron discloses its mobile device establishing a radio link with a base station and sending the measures of the signal strength to the central processor over the link. EX1010, [0041]-[0042], Fig. 2. A POSITA would thus understand that the mobile device communicates with the central processor via *one or more base*

stations connected to said one or more electronic interfaces of the central processor.

- c) **Claim 16. The clearinghouse system of claim 14 wherein said local ad servers provide web page view and usage statistics to said database through said one or more electronic interfaces.**

199. The combination renders obvious claim 16. In my opinion, Chmaytelli discloses the claimed web page view and usage statistics.

200. Chmaytelli discloses *local ad servers provide web page view and usage statistics to said database through said one or more electronic interfaces*. It discloses that the “ad dispatch server 130” collects the responses to an ad, and collates them so that “information regarding whether all pages of an ad were viewed, whether some links were followed, and the like” can be tracked and reported. EX1012, [0043].

- d) **Claim 27**

- (1) **27[pre] A content providing system which provides selected content to one or more mobile or fixed devices located in specific locations, comprising:**

201. See claim 14 regarding the addition of local ad servers taught by Chmaytelli to Dawson’s clearinghouse with location tracking features of mobile users from Aaron. In my opinion, the combination would provide a *content providing system which provides selected content to mobile devices*.

- (2) **27[a] a clearinghouse system for communications networks, said clearinghouse system including**

202. *See* Ground 2, limitation 20[pre].

- (3) **27[a][i] one or more computers which interfaces with a database, said database including one or more of**

203. *See* Ground 2, limitation 20[a].

- (4) **27[a][i][1] performance or quality of service information for one or more specific locations,**

204. *See* Ground 2, limitation 20[a].

- (5) **27[a][i][2] records for one or more telecommunications carriers which identify infrastructure and location information for one or more specific locations,**

205. *See* Ground 2, limitation 20[a][i].

- (6) **27[a][i][3] records for one or more end users which identify telecommunications assets or property assets owned or controlled by said one or more end users, and**

206. *See* Ground 2, limitation 20[a][ii].

- (7) **27[a][i][4] public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic**

locations, and information about carriers serving said geographic locations; and

207. *See* Ground 2, limitation 20[a][iii].

- (8) **27[a][ii] one or more electronic interfaces to said one or more computers which permit one or more mobile or fixed devices to be connected to said clearinghouse system, said one or more electronic interfaces permitting one or more of performance or quality of service information obtained from said one or more mobile or fixed devices that are located in one of said one more specific locations to be automatically or manually updated into said database, and**

208. *See* Ground 2, limitation 20[b].

- (9) **27[a][iii] at least one of said one or more telecommunications carriers or said one or more end users or one or more parties which are not telecommunications carriers or end users to review, catalog or sort information in said database;**

209. *See* Ground 2, limitation 20[b].

- (10) **27[b] wherein a geographic location of one or more mobile or fixed devices is identified; and**

210. The combination renders obvious this limitation. In my opinion, in the combination, Aaron teaches *identifying a geographic location* of a *mobile device* by multiple methods such as “via a Global Positioning System (GPS) receiver in the wireless terminal, via triangulation methods using measurements from multiple base stations, or by determining a geographical location of a base station with which the wireless terminal has a radio link.” EX1010, [0042].

- (11) **27[c] one or more local ad servers in communication with said one or more electronic interfaces of said clearinghouse system configured to use said geographic location, said local ad servers providing localized content to said one or more mobile or fixed devices.**

211. *See* claim 14, *supra*.

- e) **Claim 28. The content providing system of claim 27 further comprising one or more base stations in communication with said one or more electronic interfaces of said clearinghouse system.**

212. *See* claims 15, 27, *supra*.

- f) **Claim 29. The content providing system of claim 27 wherein said local ad servers provide web page view and usage statistics to said database of said clearinghouse system through said one or more electronic interfaces.**

213. *See* claims 16, 27, *supra*.

- g) **Claim 30. The content providing system of claim 27 wherein said means for identifying a geographic location includes a GPS associated with each of said one or more mobile or fixed devices.**

214. The combination discloses this claim. In my opinion, in the combination, Aaron discloses the claimed *means for identifying a geographic location includes a GPS associated with each of said one or more mobile or fixed devices*.

215. As for the performance of the claimed function, *see* above limitation 27[b] regarding the use of a GPS for identifying a geographic location of the mobile

device. The corresponding structure is, e.g., the circuitry including the “Global Positioning System (GPS) receiver in the wireless terminal.” EX1010, [0006], [0028], [0042], Fig. 1.

- h) Claim 31. The content providing system of claim 27 wherein said means for identifying a geographic location includes a means for determining one more of towers and frequencies being used by said one or more mobile or fixed devices.**

216. The combination discloses claim 31. In my opinion, in the combination, Aaron and Dawson collectively disclose the claimed *means for determining one more of towers and frequencies being used by said one or more mobile or fixed devices*.

217. Regarding performance of the claimed function, Aaron discloses that one way the system can determine a wireless device’s location involves “determining the geographical location of the base station 202 with which the wireless terminal 101 has a radio link” (*determining... towers... being used by one or more of said... mobile or fixed devices or end users*). EX1010, [0042].

218. As explained above, a POSITA would have found it obvious to modify Dawson to include the location-determining aspects of Aaron. In this combination, the corresponding structure is Dawson’s server modified to also include the location determination functionalities as disclosed in Aaron.

- i) Claim 32. The content providing system 27 wherein said local ad servers provide content to said one or**

**more mobile or fixed devices tuned to a specific
transmitted signal.**

219. The combination renders obvious claim 32. In my opinion, in this combination, Chmaytelli discloses the claimed content provision functionalities to the mobile devices.

220. Chmaytelli discloses that “carriers can offer both opt-in and opt-out options to end-users” and that “[o]pt-out indicates that the end-user has the ability to refuse to receive ads.” EX1012, [0050]. As such, Chmaytelli’s *local ad servers* would only *provide content to [one or more] mobile devices* that have selected the opt-in option (*a specific transmitted signal*).

E. Ground 4: Daley, Aaron, Scherzer and optionally Dawson (Claims 20-26)

1. Combination

221. In this combination, Daley’s mobile device monitoring and diagnostic system is modified to leverage the mobile device geographic location capabilities and access point quality measurement collection and use, as disclosed by Aaron and Scherzer. In my opinion, if necessitated by the term *clearinghouse*, it would have been obvious to further modify the system to provide support for telecommunications infrastructure procurement as, e.g., disclosed by Dawson.

222. Daley, Aaron, and Scherzer are each directed to systems and methods for tracking and improving the wireless network experience: each describes collecting data, including quality of service information, from wireless devices and

storing and analyzing it on a central sever to support issue remediation and/or service improvement. Dawson is also analogous art, at least because it is directed to the collection and presentation of information suitable for a telecommunications infrastructure procurement clearinghouse that is similarly designed to improve and expand wireless services and thereby improve or expand the wireless network.

2. Motivation to Combine

a) Adding Device Location Information Improves Problem Assessment and Remediation

223. As noted above, Daley is directed to systems and method involving applications running on mobile devices that collect and transmit information about those devices to a server, allowing end-users of the server system (who may access that system via web and other interfaces) such as mobile subscribers to remotely diagnose and resolve problems faced by the subscribers and allowing them to engage in self-care. EX 1009, [0033]-[0034], [0038]-[0042], [0215]-[0216], Figs. 1, 4, 6-18.

224. In my opinion, in the context of Daley's system, a POSITA would have known that, when assessing any wireless networking problem or issue, it can be helpful to know the location of the customer, and this is especially true when attempting to assess and resolve an issue with the network performance of a mobile wireless device. The technical rationale for location awareness stems from the fundamental physics of radio propagation—signal strength, interference patterns,

and coverage quality all vary significantly based on geographic position. Indeed, a system would benefit from having access to information about the location of the mobile device at the time of the monitored performance and about the infrastructure (e.g., base stations or towers) with which the device was or could have been in communication. This location-aware approach enables operators to distinguish between device-specific problems and location-based network issues, thereby facilitating accurate diagnosis and targeted resolution. A POSITA would therefore have looked to art that describes collecting and providing that information to be used in the context of a system like Daley.

225. Aaron and Scherzer are such references. As set forth above, Aaron, like Daley, is directed to collecting and measuring service quality information from wireless devices. The technical similarity between these systems would have suggested to a POSITA that Aaron's enhancements could be beneficially applied to Daley's framework. Aaron discloses more detail about the type of network performance data disclosed in Daley, specifically reciting "signal strength," "signal quality," and "dropped call[s]," and signal-to-noise ratios. EX1010, [0040]. These granular performance metrics provide quantitative characterization of the exact network conditions experienced by mobile devices. Similarly, Scherzer is directed to improving the performance of a wireless device based in part on collecting data from that device into a server-side database. EX1011, [0061], [0069], [0074]. The

database includes the geographic location of wireless access points and both real-time and historical data about their performance. EX1011, [0067]-[0069], Fig. 1. A POSITA would have looked to the teachings of Scherzer and Aaron when considering how to add location related features to Daley.

226. Furthermore, as discussed above in ¶84, a POSITA would have understood that adopting a centralized data collection architecture enables systematic aggregation and analysis of network-wide performance data. Aaron discloses collecting information about the geographic location of the wireless device when service quality information is collected. EX1010, [0006], [0042]. A POSITA would have recognized that this collection of performance metrics and location data creates location-aware diagnostic information that transforms discrete network issues into concrete localized problems. The combination of detailed performance parameters with precise location coordinates enables network operators to generate coverage maps, identify interference zones, and optimize infrastructure placement based on empirical field data. Therefore, incorporating Aaron's location-aware quality measurement techniques into Daley's management system would have been a straightforward enhancement that significantly improves diagnostic capabilities.

b) Collecting Base Station Information Improves Problem Assessment and Remediation

227. Further, collecting base station information improves problem assessment and remediation. A POSITA also would have been aware that, because

mobile devices were oftentimes within range of multiple cell towers or access points (base stations), connecting a mobile device to a different base station was a common handover / handoff exercise, *i.e.*, switching to a new base station to maintain service quality as the mobile device moves, which could be both a useful diagnostic tool (*e.g.*, to help determine if an issue has its root in the device or in the network infrastructure) and a potential remedy (*e.g.*, if the problem remains when connected to another base station) in the context of Daley. EX1015, at 117-120, 142-156; EX1016, at 336-39; EX1032 at 4-7, 15-30, 31-38, Table 11.4; EX1035; EX1036 at 1:18-4:36. The technical implementation of handover decisions often requires sophisticated evaluation of multiple performance parameters across available base stations to ensure seamless service continuity. EX1015, at 117-120; EX1016, at 338-39; EX1032 at 19-30, 275-302, 327; EX1036 at 1:18-4:36. For example, Daley discloses monitoring “roaming transitions,” which involve base station transitions. EX1009, [0145]. A POSITA would have understood that base-station specific monitoring and configuration capabilities based on service quality measurements, cell load and capacity, mobility patterns (*e.g.*, speed of the mobile device movement) were important considerations for handover decisions. EX1032 at 19-30, 251-273; EX1033 at 1:10-2:67.

228. These technical factors directly influence handover optimization—service quality measurements determine signal adequacy, cell load metrics prevent

congestion-induced failures, and mobility patterns enable predictive handover timing. *Id.* Moreover, Daley as modified to include location-related collection and processing (*e.g.*, as disclosed in Aaron) would have invited these additional capabilities with even more vigor, because such a system is already tracking the location of the device, meaning it would have been a missed opportunity to not also provide location-related functionality like base station recommendations or rankings. *Id.* A POSITA would have recognized that location awareness naturally extends to base station selection optimization, transforming passive monitoring into active network management. *Id.* A POSITA would therefore have looked to art that describes collecting, providing, using information about base stations and access points in the context of a system like Daley or Daley as modified per Aaron.

229. Notably, both real-time location data and historical performances based on location are important to achieve the goal of Daley—improving user experiences with mobile devices as they are on the move. The real-time and historical data enables both reactive and predictive network optimization strategies. The former provides instantaneous measurements from surrounding base stations that help avoid dropped calls or degraded data sessions. *See, e.g.*, EX1015, at 117-120; EX1032 at 19-30. The latter reveals real-world reliability and allows the system to predictively make adjustments, for example, by incorporating factors such as peak calling time and local interferences, in order to optimize service provision. EX1015 at 117-120;

EX1032 at 19-30; EX1035. Thus, the system can address immediate connectivity issues while simultaneously learning patterns that prevent future problems. Furthermore, Daley specifically contemplates “anticipatory tracing” or collection of data “for a problem that is expected to occur at some time in the future.” EX1009, [0060]. A POSITA would have understood that this anticipatory capability requires historical pattern analysis to identify recurring issues and predict future network conditions.

230. As described above, Scherzer discloses such a system. Like Daley and Aaron, Scherzer is directed to improving the performance of a wireless device based in part on collecting data from end-user devices into a server-side database. EX1011, [0061], [0069], [0074]. This architectural similarity demonstrates a common technical approach across the art for addressing wireless performance optimization challenges. The database includes the geographic location of wireless access points and both real-time and historical data about their performance. EX1011, [0067]-[0069], Fig. 1.

231. Scherzer’s collected data enables sophisticated access point selection algorithms that consider both current conditions and historical reliability trends. A POSITA would have looked to the teachings of Scherzer when considering how to add base-station related features to Daley (or Daley as modified per Aaron). Therefore, incorporating Scherzer’s access point evaluation and ranking capabilities

would have been a natural enhancement that leverages existing location and performance data to optimize connection decisions.

c) Collecting Both Base Station Information and Location Information Further Improves Problem Assessment and Remediation

232. In addition, collecting both base station information and location information improves problem assessment and remediation in the Dailey system in a synergistic fashion. Having both location and base station information can help determine if there is a location-specific issue (e.g., a storm, power outage, or some source of interference), a base station specific issue (e.g., too much demand or malfunction), or a device or user specific issue. EX1015, at 35-41, 117-120; EX1032 at 19-30, 275-302; EX1035 at 245-247. This multi-dimensional diagnostic capability was a commonsense network troubleshooting methodology. A POSITA would have recognized that correlating performance degradation with both geographic coordinates and base station identifiers enables precise root cause analysis through systematic elimination of potential failure sources. EX1032 at 19-30, 251-274, 275-302; EX1035. The technical implementation of this diagnostic framework transforms ambiguous connectivity problems into categorized issues with targeted resolution strategies.

233. Furthermore, a POSITA would also have understood that it was in the best interests of customers and carriers to expeditiously and accurately remedy, and

not just diagnose, a wide range of issues. The economic and operational benefits of rapid problem resolution include reduced support costs, improved customer satisfaction, and decreased network congestion from repeated connection attempts. By modifying Daley's system to include location and base station information, the system would be able to take a wider range of appropriate remedial actions, including configuring a device to avoid interference or otherwise optimize connectivity, to avoid excessive power use if there appears to be a regional power outage, or even to connect to alternative base stations if a base station appears overloaded or unavailable. EX1032 at 19-30, 251-274, 275-302.

234. These remedial capabilities leverage the diagnostic intelligence to implement context-appropriate solutions—interference avoidance through frequency adjustments, power conservation during infrastructure failures, and load balancing through base station redistribution. The latter remedy, in particular, was known to possibly have financial implications for a device user (*e.g.*, because of roaming or off-network fees). A POSITA would have understood that in some circumstances it may be desirable to provide a list of available base stations (ideally ranked according to various metrics such as availability, performance, or cost) and allow the device user to make the final decision. This user-oriented selection mechanism balances technical optimization with economic considerations, empowering users to make informed connectivity choices based on their individual

priorities. EX1016, at 340; EX1017, at 216-217. Therefore, the combination of automated remediation and user-guided selection creates a flexible resolution framework that addresses diverse failure scenarios.

235. Additionally, a POSITA would have known that enhancing Daley to provide these features and functionality would be likely to provide a competitive advantage (ultimately improving customer satisfaction and retention) or to at least be necessary to avoid competitive disadvantage as these features became “table stakes.” EX1017, at 216-217. The wireless telecommunications industry’s competitive landscape drives continuous service improvement, making advanced diagnostic and remediation capabilities essential for market viability. Customer expectations for reliable connectivity and transparent problem resolution create market pressure for sophisticated management systems. *Id.*

236. Knowing that these features and functions are desirable to have in a system like Daley’s, a POSITA would have recognized that Aaron and Scherzer disclose their implementation in systems that are technically similar to that of Daley. The architectural parallels between these systems—client-server communication, performance data collection, and database storage—demonstrate common technical approaches to wireless network management. A POSITA would have understood that the complementary features disclosed in Aaron and Scherzer could be readily integrated into Daley’s framework, leveraging the existing infrastructure while

adding location awareness and base station information. Thus, the combination of these references provides a complete technical solution for implementing comprehensive mobile device management with geographic and infrastructure-aware capabilities.

d) Network Expansion is a Natural Complement to Performance Tracking and Problem Identification

237. Moreover, network expansion is a natural complement to performance tracking and problem identification. A POSITA would have known that some of the performance issues that would have been identified by a system like Daley would be associated with overall network capacity and infrastructure deployment, and that a solution to (as opposed to a mitigation of) such issues might be to expand the network's infrastructure, *e.g.*, to deploy more base stations at advantageous locations. Indeed, a POSITA would have recognized that data about the use of network capacity and data about the location of users and their devices are key inputs into longer-term capacity planning. EX1032 at 19-30. This data-driven approach to infrastructure planning transforms reactive troubleshooting into proactive capacity optimization. Moreover, for business and competitive reasons, carriers would have been motivated to expand the network to alleviate systemic issues and strategically improve capacity and performance by deploying infrastructure to meet observed customer demand. *Id.* Therefore, the integration of diagnostic capabilities with

infrastructure planning represents a natural evolution of network management systems.

238. Daley discloses generating diagnostic statistics for a selected group of devices. EX1009, [0277], Fig. 17. Aaron recognizes that quality-of-service maps allow technicians to identify problems and determine whether changes are needed to the communication network or its components. EX1010, [0036]. A POSITA would have been motivated to incorporate the diagnostic statistics and quality-of-service maps to improve the information available to technicians regarding the status of the wireless communication network, its components, and the services provided. The combination would allow technicians to gain both collective and granular views of the network's behavior and identify patterns on where and when service degradation occurs and thus enable both remediation and prevention. EX1009, [0060]. This dual perspective—aggregate trends and individual incidents—provides the analytical foundation necessary for distinguishing systemic infrastructure limitations from isolated technical issues.

239. Knowledge of the complementary nature of (1) monitoring, diagnostic, and service systems like Daley (including as modified to include location and access point capabilities) and (2) systems supporting network expansion would have motivated a POSITA to combine the two because the same information that is reported or monitored regarding subscriber's experience of network performance

(e.g., a system like Daley) is also useful for future network planning. For example, the performance of wireless devices at a particular location, the performance of and demands upon the wireless network when supporting devices at a particular location, and the presence of user devices in locations with no adequate carrier infrastructure all inform whether and to what extent a carrier should pursue deployment of additional network infrastructure supporting that location. These diverse data points create a comprehensive assessment framework that quantifies both current service gaps and future capacity requirements.

240. Further, a POSITA would have recognized the technical efficiency of consolidating data repositories and processing infrastructure to serve multiple operational needs, such as network expansion planning and infrastructure procurement. The use of a unified data platform would reduce duplicated storage, decrease system complexity, lower costs from redundant data acquisitions, minimize data synchronization challenges, and enable consistent analytics across operational and strategic functions.

241. So motivated, a POSITA would have looked to the teachings of references like Dawson. Dawson discusses integrating signal information from systems such as deciBel Planner and MapInfo with a property and infrastructure clearinghouse. EX1013, [0026]. This integration demonstrates the technical feasibility of combining predictive modeling tools with infrastructure management

systems. Further, a POSITA would have recognized that Dawson and Aaron, for example, both address accurate characterization of network coverage and performance for a wireless service provider.

242. Specifically, Dawson discloses that properties under consideration as expansion points may undergo two different evaluations: whether the site is real estate friendly (e.g., can rights to the property be secured and exercised) and whether a serviceable signal can be supplied to the site. EX1013, [0023]-[0027]. Dawson uses software-based estimation of signal strength and overlays that with map and terrain data to provide an intuitive view. EX1013, [0026]-[0027], [0034], Fig. 3. Meanwhile, Aaron teaches recording the location and signal strength of mobile devices and using that to create a quality of service or coverage map. EX1010, [0036].

243. A POSITA would have recognized that incorporating the data kept in Dawson's database into the database of the underlying combination, and adding to that underlying system the network strength data disclosed by Dawson, allows for a system that is enhanced by having both predictive performance information and actual data that can validate and refine that predictive data. This hybrid approach combines theoretical propagation models with empirical field measurements to create more accurate coverage predictions. Also, supplementing potentially incomplete or ever-aging real-world data with software estimation can improve the

data available to users and carriers, which is a goal of both references. Therefore, the integration of Dawson's infrastructure planning capabilities with the diagnostic and monitoring systems of Daley, Aaron, and Scherzer creates a comprehensive network management platform that addresses both current operational needs and future infrastructure requirements.

3. Reasonable Expectation of Success

244. In my opinion, a POSITA would have had a reasonable expectation of success in adding location and access point capabilities to Daley, including as disclosed by Aaron and Scherzer. The technical implementation of these enhancements involves well-established mobile device capabilities and standard software engineering practices that were routine in the art. Modifications to Daley's mobile devices to collect geographic location, as disclosed in Aaron, and access point information, as disclosed in Scherzer, would be straightforward and well within the abilities of a POSITA. A POSITA would have recognized that GPS receivers and base station identification modules were already standard components in mobile devices, requiring only software integration to capture and report this additional data through existing collection mechanisms.

245. Furthermore, transmitting the additional data could have been done by, for example, simply adding additional header and content fields consistent with the transmission protocols disclosed by Daley, with only a minimal impact on consumed

bandwidth. A POSITA would have understood that these modest data additions are straightforward extensions or modifications and represent only negligible overhead compared to the diagnostic and performance data already being transmitted by Daley's system.

246. On the server side, a POSITA would be capable of extending the databases already disclosed by Daley by (for example, if a relational database is used) adding new columns or tables to account for the additional datatypes and relationships, such as a table for access points or towers with information about them, and a column for collected performance data that includes the location of the device at the time of collection. The technical implementation would leverage existing database management capabilities while preserving the established data model's structure and query patterns.

247. Additionally, adding user interface pages to support this additional content would also have been within the skillset of a POSITA, requiring the same type of work that would have been necessary to create the pages already disclosed in Daley. The user interface modifications would employ standard web development techniques to display location data on maps, present access point lists, and visualize geographic performance patterns. A POSITA would have recognized that these interface enhancements utilize common UI components and visualization libraries that were readily available and widely deployed in similar systems. Therefore, the

technical modifications required to incorporate location and access point capabilities into Daley's system represent routine engineering tasks that a POSITA would have successfully implemented with high confidence of success.

248. In my opinion, a POSITA would also have understood that information about the location of a wireless device and information about the location and properties of wireless infrastructure can be sourced or determined in multiple ways from multiple sources and a POSITA would have known how to implement each of the various options. The availability of multiple location determination methods provides system designers with flexibility to select appropriate techniques based on accuracy requirements, power consumption constraints, and infrastructure availability. For example, it was known that a device could determine its location, with varying degrees of accuracy and precision, by: using GPS (integrated into the device or otherwise), measuring the signal delay to an emitter of known location, triangulation with multiple emitters, comparison of observed network performance to devices known to be in roughly similar locations, etc. EX1018, at 330-33; EX1019, at 341-43.

249. A POSITA would have understood that such methods like advanced forward link trilateration (AFLT), round trip delay (RTD), cell/sector centroids, etc., were well known in the art and were embodied in commercial solutions such as Qualcomm's gpsOne®. EX1018, at 330-33; EX1019, at 341-43; EX1020, [0005]-

[0007], [0068]-[0095], Figs. 5-9. These commercial implementations demonstrated the technical maturity and reliability of hybrid positioning systems that combine multiple location techniques for optimal accuracy. Furthermore, the location of a base station could be determined, for example, from commercial databases (e.g., Qualcomm's Base Station Almanac) offering location determination services for mobile devices. EX1020, [0008]-[0016].

250. Also, publicly accessible registries and commercial databases (with paid subscriptions) of wireless infrastructure like cell towers and base stations were well known at the time. These included the FCC's Antenna Structure Registration (ASR) and the TowerSource online site-location tool. EX1021, at 13. Such registries included not just location, but also various communication properties and the identity of the associated carrier. *See, e.g.*, EX1022; EX1023. For example, the FCC ASR offered open access with a variety of search options such as the location, type, or owner of the antenna structures. EX1024. A POSITA would have been familiar with a variety of ways to incorporate data from such registries into a system like Daley, including performing bulk downloads for full local integration, accessing the registries through an API or scripting, or linking these external databases through federated queries "on demand." In other words, the state of the art was such that a POSITA would have found it straightforward and logical to include tower and base station information in a management and monitoring system such as Daley. Indeed,

because a database would be a logical and well-known place to store this information, a POSITA would have found it obvious to include this information in the database of the combination. Moreover, storing the public records in the database would make recurrent use faster (because of the local storage) and improve availability (e.g., if the remote record source were unavailable).

251. It was also well known at the time that among the pieces of information stored on a wireless device (and that could therefore be collected from a mobile device in, for example, the same fashion as disclosed in Daley) are (for GSM devices) the PLMN (public land mobile network) identifiers corresponding to the devices home or network (HNI) and actual active network (the serving or registered PLMN identifiers (for GSM systems) and (for CDMA devices) the ESN, MEID, and SID numbers. EX1015 at 102-104, 113-114; EX1032 at 4-7. 13-18, 32-38, 233-243, 319, 369-70, 376, 385 EX1009, [0104], [0291] (disclosing collection of the relevantly similar IMEI and ESN identifiers). A POSITA would have recognized that these standardized identifiers provide useful network and carrier context for diagnostic and management purposes.

252. In GSM systems, a PLMN consists of a 3-digit country code and a 2- or 3-digit carrier code. The home network (HNI) is tied to the device's SIM card and includes the native or home country code (MCC) and carrier code (MNC). EX1025, at 10-11; EX1034 at 8. The active tower's code PLMN has a similar format,

but may include different values if the device is, e.g., roaming. EX1025 at 10-11, 29; EX1034 at 10-14. This distinction enables precise identification of roaming scenarios—if the device is not roaming, the two are typically identical, but if the device is roaming, they may differ. EX1025 at 13-15. The device's IMSI is the HNI plus the device's SIM card identifier. EX1025 at 10-11; EX1032 at 192-193, 356-358, 364-368 ; EX1034 at 10-11. On GSM networks, it is the IMSI and not the IMEI that directly identifies the subscriber to a carrier or network and is used for, e.g., authentication and billing. EX1015 at 102-103, 113-114; EX1032 at 5, 192-193, 355-357, 369. Accordingly, when Aaron discloses integration with billing systems to provide credits to subscribers who contribute to the system (EX1010, [0037]), a POSITA would have understood that this crediting would be facilitated or enabled by collecting the contributor's IMSI. In the United States, use of GSM became increasingly common in the 1990s, reaching nearly 40% of the market by the end of 2006. EX1036 at 11.

253. Similarly, in the context of the CDMA networks also used in the United States, the ESN or MEID identifier identified a specific phone and a MIN identified a specific subscriber within a carrier's network. See EX1038 at 224-227. Cell towers would broadcast a SID (system identification code) that identified the carrier, and a subscriber's phone could compare the received SID to a list of SIDs stored on the phone to see if the tower was part of the home network or was otherwise usable by

the phone. *Id.*, at 470-71. A POSITA would have understood that it was routine to parse these standardized identifier systems and determine carrier information for the purposes of network selection, roaming detection, and carrier-specific service provisioning.

254. The widespread use of these two systems would have not just provided additional avenues by which a POSITA could add value to a system like that of Daley by accounting for carrier and tower information (*e.g.*, by collecting this information from devices or third party databases and using it for diagnostic and analytics and by setting associated properties or providing identifiers associated with potentially useful towers), it would have guided a POSITA in understanding what would likely be used in the implementation of this functionality by providing standard data points to collect and to set. These standardized identifiers eliminate ambiguity in network and device identification while enabling interoperability across different carrier networks and device manufacturers.

255. Furthermore, a POSITA would also have had a reasonable expectation of success in modifying Daley (as extended per Aaron and Scherzer) with certain aspects of Dawson. The technical compatibility of these systems stems from their shared architectural patterns and complementary functional domains. Integrating Dawson's procurement-supporting data into the underlying database would again be a straightforward matter of adding additional tables, columns, and relationships to

that database, and would involve sourcing that data just as the already-disclosed data was sourced.

256. It would have been similarly straightforward to add support for procurement-enabling reports and queries. The technical implementation would leverage existing query processing infrastructure while adding domain-specific business logic for infrastructure planning and procurement workflows. All these underlying components were well-established and compatible and integration of them would be a routine practice with predictable operational success. Therefore, a POSITA would have confidently integrated these complementary systems to create a comprehensive network management and planning platform.

4. Analysis

a) Claim 20

(1) 20[pre] A clearinghouse system for communications networks, comprising:

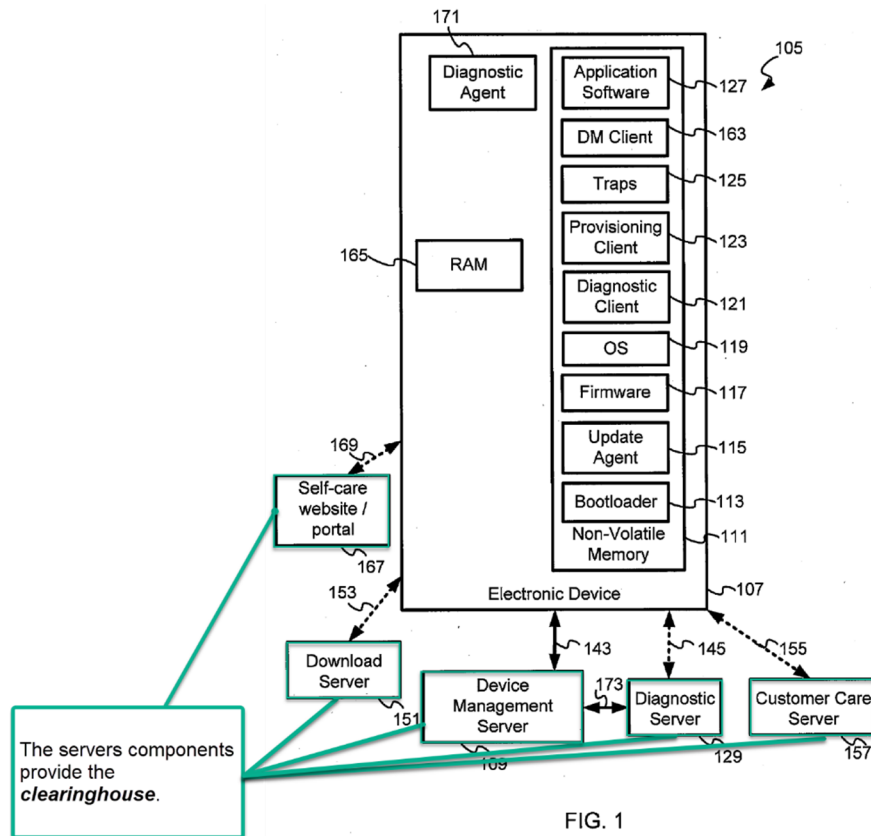
257. Assuming the preamble is limiting, the combination renders obvious *a clearinghouse for communications networks*. In my opinion, Daley discloses methods and systems that enables intermediaries such as a system operator to manage and perform remote diagnostics of mobile devices on mobile networks, i.e., *communications networks*. EX1009, Abstract. A POSITA would have recognized that these mobile networks constitute the claimed communications networks, as they

provide bidirectional data communication capabilities between mobile devices and network infrastructure.

258. Furthermore, the system is a *clearinghouse* for such networks: it includes a diagnostic server that receives and stores monitoring, tracing, configuration, and diagnostic data from diagnostic client software running on each mobile device (EX1009, [0039]-[0040], [0215]-[0216]) and web pages that provide Internet-based interfaces into the collected data to users of the system, including the wireless network provider and the customer (EX1009, Figs. 15-18). A POSITA would have understood that this architecture implements the essential characteristics of a clearinghouse—centralized collection, processing, storage, and distribution of information from multiple sources to multiple stakeholders.

259. The technical implementation establishes a comprehensive information hub where diverse operational data converges for analysis and dissemination. Daley's Figure 1 illustrates the server components of the system, demonstrating the centralized architecture that enables clearinghouse functionality. Through this server-based infrastructure, the system aggregates distributed device data into a unified repository, processes this information to generate actionable intelligence, and provides controlled access to relevant stakeholders through web-based interfaces. Therefore, Daley's system architecture embodies the fundamental

technical and functional characteristics of a clearinghouse for communications networks.



260. In the alternative, if *clearinghouse* refers to a system that facilitates the procurement of property and infrastructure for a telecommunications system, then it is rendered obvious by the combination including Dawson. In my opinion, Dawson discloses precisely this type of clearinghouse functionality through its comprehensive infrastructure procurement platform. For example, Dawson's integrated database system 800 organizes sales activities for telecommunication assets including properties where wireless telecommunication infrastructure can be deployed, such as buildings or roof rights. EX1013, [0002], Figs. 1, 8. A POSITA

would have recognized that this system implements a marketplace clearinghouse that connects infrastructure needs with available deployment opportunities.

261. The technical architecture facilitates multi-party transactions by providing a centralized platform where supply and demand for telecommunications infrastructure converge. Users such as real estate agents, property owners, fixed wireless communications service providers, or wireless service users can access, search, and update the contents of the database. EX1013, [0023]-[0025]. Through this multi-stakeholder access model, the system enables efficient matching of available properties with infrastructure deployment requirements.

262. Furthermore, a POSITA would have understood that Dawson's clearinghouse functionality addresses the complex coordination challenges inherent in telecommunications infrastructure deployment. The system aggregates diverse information types—legal rights, technical feasibility assessments, and business terms—into a unified transactional platform. This integration transforms traditionally fragmented procurement processes into streamlined workflows where stakeholders can evaluate opportunities, negotiate terms, and execute agreements through a single system. Therefore, Dawson's database system establishes a comprehensive clearinghouse that facilitates all aspects of telecommunications infrastructure procurement and deployment.

(2) 20[a] one or more computers which interface with a database, the database including

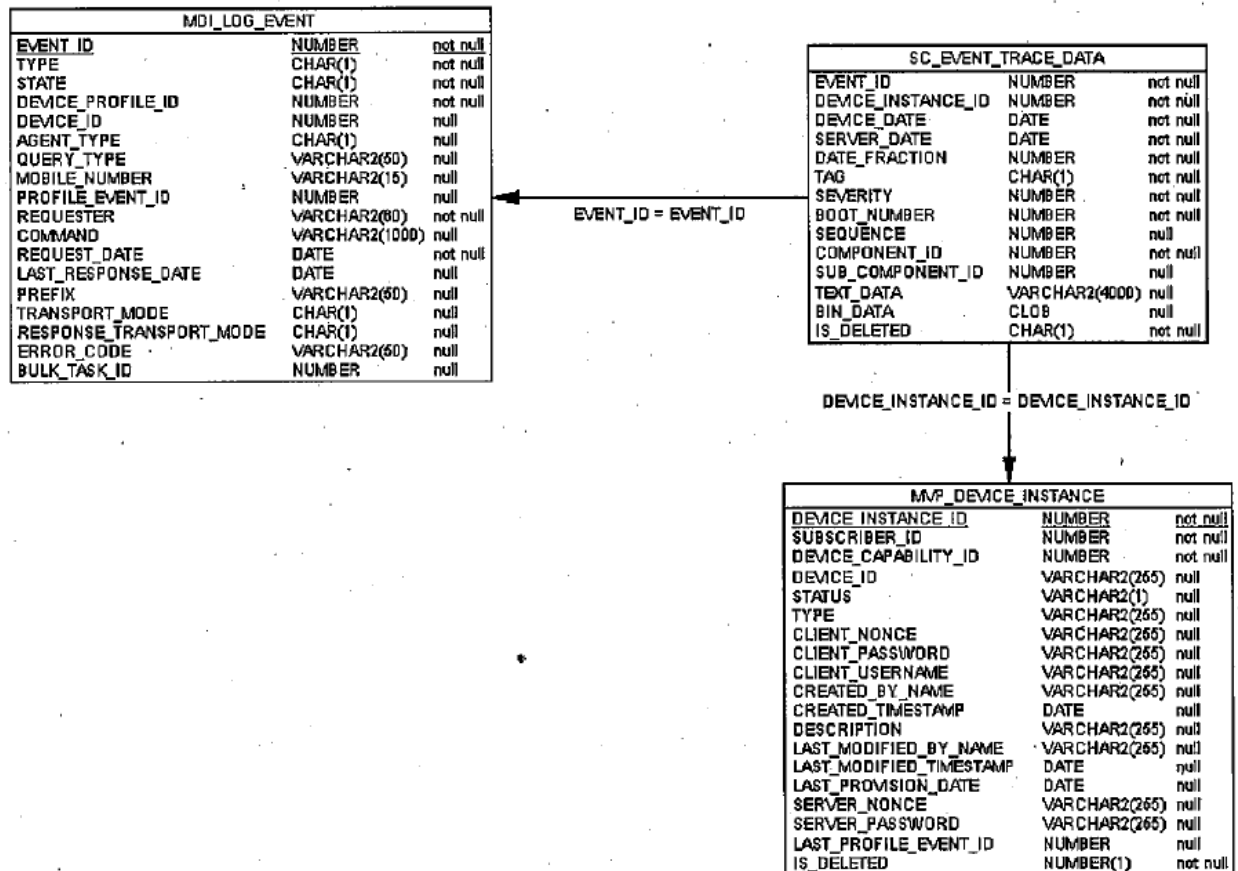
**performance or quality of service information
for one or more specific locations, and one or
more of**

263. The combination renders obvious this limitation. In my opinion, Daley discloses the claimed elements through its server-based diagnostic architecture.

264. Daley discloses a “diagnostic server” (*one or more computers*) that receives diagnostic tracing and log data from mobile devices and stores it in a database (*which interface with a database*). EX1009, [0071], [0215], [0216]. A POSITA would have recognized that this diagnostic server represents a computer system specifically configured to perform data collection, processing, and storage operations. The server’s interface with the database enables persistent storage of diagnostic information, supporting both real-time monitoring and historical analysis capabilities.

265. Furthermore, Daley Figure 14 provides a representation of the database tables containing the diagnostic tracing and log data. *See also* EX1009, [0249], [0252]. This figure illustrates the structured data model that organizes collected information into relational tables with defined schemas and relationships. A POSITA would have understood that this database architecture implements standard relational database management principles, enabling efficient data storage, retrieval, and query processing. The interface between the diagnostic server and database facilitates systematic data operations including insertion of new diagnostic records,

retrieval of historical data for analysis, and aggregation of metrics across multiple devices. Therefore, Daley's diagnostic server and database system fully disclose computers that interface with a database as claimed.



266. The diagnostic server *interface[s]* with the database, *e.g.*, when it writes the diagnostic tracing and log data to the database after it receives the data from the mobile device. EX1009, [0215]. In my opinion, this write operation demonstrates a fundamental database interface capability where the server executes data insertion commands to persist collected information. A POSITA would have recognized that this interfacing involves standard database operations including connection establishment, transaction management, and execution or equivalent data

manipulation commands, *e.g.* using standard database technologies like SQL (structured query language). The technical implementation ensures that diagnostic data flows from mobile devices through the server and into persistent storage, creating an auditable record of device performance and network conditions.

267. Additionally, Daley discloses providing web pages to mobile devices by “displaying diagnostic/trace data from ... an electronic device” as seen in Figures 15 and 16. EX1009, [0273]-[0274]. These web pages are presented as a result of the read operations that retrieve stored diagnostic information. A POSITA would have understood that this functionality requires a webserver that *interfaces with the database* and processes the query results suitable for a web browser. A POSITA would also have understood that these functionalities of the diagnostic server/trace server and webserver could be integrated or implemented on separate servers or sets of servers. EX1009, [0071]. For example, the diagnostic server may be fully integrated with the trace server and the webserver, the three modules may be separately deployed on different servers, or some hybrid mode may be adopted. EX1009, [0033]-[0034], [0071], [0216]. Regardless of the implementation, they collectively would satisfy the *one or more computers* limitation.

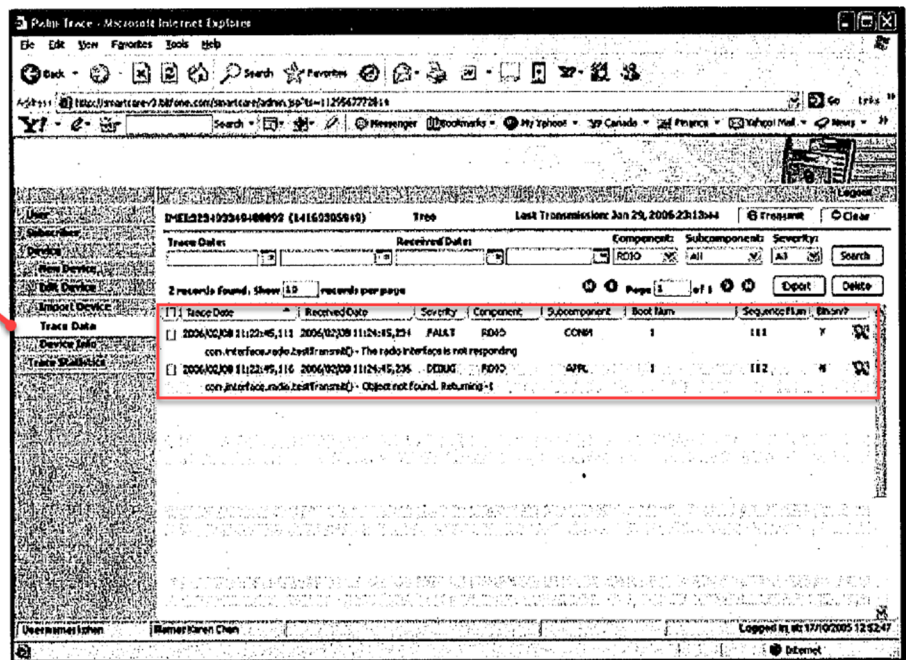
268. The technical architecture supports bidirectional database interfacing—write operations for data ingestion and read operations for data retrieval and display. Figures 15 and 16 illustrate how these interfaces transform raw database records into

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meaningful diagnostic presentations, enabling both network operators and customers to access relevant performance information. Through these complementary interface mechanisms, the system provides comprehensive database interaction capabilities that support the full lifecycle of diagnostic data from collection through analysis. Therefore, Daley discloses multiple components that interface with the database through distinct but complementary operational modalities.

Trace data from the **database** is displayed in the web page.



269. The data Daley collects from mobile devices through the diagnostic client includes “network *performance* data.” EX1009, [0041]. Daley’s diagnostic client also collects log data that includes *quality of service* information: “discrete events such as low/high signal or roaming transitions” of the mobile device. EX1009, [0145]; *see also e.g.* EX1009, [0270] (an exemplary log entry: “2006/01/23 11:23:33 2006/01/23 11:26:121 12 22 DEBUG RADI SGNL Signal ‘extremely

low', problem"). A POISTA would have understood that signal strength is a *quality of service* measurement because it measures the wireless service's level of availability and quality of radio frequency coverage. These metrics quantify the actual service quality experienced by users, providing objective measurements of network performance degradation or improvement.

270. Additionally, Aaron's database contains network *performance* and *quality of service* information *for one or more specific locations*. Aaron discloses supplementing *performance* and *quality of service* measurements collected from a wireless device with the geographic *location* of the device at the time of measurement. EX1010, [0004]. This location-aware data collection transforms isolated performance metrics into geographically contextualized service quality intelligence.

271. A POSITA would have recognized that Aaron further discloses storing the quality of service information alongside the *geographic location* of the mobile device in a database and aggregate such information into quality-of-service maps. EX1010, [0031], [0036], [0037], [0043]. This aggregation mechanism enables a location-based analysis of network performance patterns, identifying geographic areas with consistent service quality issues versus locations with reliable connectivity. The combination of temporal performance data with geographic coordinates creates a comprehensive quality assessment framework that supports

both diagnostic troubleshooting and strategic network planning. Therefore, the combination fully discloses databases containing *performance or quality of service information for one or more specific locations*.

272. As set forth in the next three subsections, the combination also renders obvious the database *including... one or more of the records* of the next three limitations. To be clear, it need not render obvious all 20[a][i] through 20[a][iii], so long as it renders obvious at least one of them.

(3) 20[a][i] records for one or more telecommunications carriers which identify infrastructure and location information for one or more specific locations,

273. The combination renders obvious this limitation. In my opinion, the technical teachings of Daley and Aaron collectively establish the claimed database records.

274. For example, Daley discloses capturing information about transitions from being on a native network to a roaming network. EX1009, [0145], [0270]-[0271], [0291]. A POSITA would have understood that these roaming transitions require the mobile device to identify and differentiate between carrier networks based on their technical characteristics.

275. A mobile network maintains subscriber information in centralized databases including the Home Location Register (HLR) and the Visitor Location Register (VLR). Cell towers would broadcast a SID (system identification number)

that identified the carrier, and a subscriber's phone could compare the received SID to a list of SIDs stored on the phone to see if the tower is part of the home network or is otherwise usable by the phone. EX1032 at 4-7, 31-38, 336.

276. These systems manage not only the subscriber's identity and service permissions but also access restrictions related to network types (e.g., GSM, UMTS) and, in some implementations, frequency band support. When a subscriber roams from his/her home network into a visited network (i.e., area covered by a different carrier), the visited network queries the HLR to authenticate the user and retrieves his/her profile. The profile includes information such as service entitlements, authentication parameters, roaming restrictions. The visited network uses the profile to authenticate the subscriber and manages call routing and mobility while the subscriber is roaming.

277. Therefore, Daley's database contains *records for one or more telecommunications carriers which identify infrastructure* to correlate with the roaming events. When roaming, the mobile device registers with the visited network, typically by attaching to one or more network nodes (e.g., base stations, controllers, or switching centers) that provide access to the visited network. EX1032 at 4-7, 31-38, 369.

278. Furthermore, Aaron describes creating "quality of service maps" that include "all types of maps and similar depictions relating to a wireless

communications system including, but not limited to, signal coverage maps, signal strength maps, and the like.” EX1010, [0009], [0021], [0031], [0036]-[0037], [0052]. Aaron details that such “quality of service maps” help the wireless service provider analyze, identify, and rectify problems, “in real time during use,” and can be consulted by technicians to “determine if problems or changes warrant any adjustment to the wireless communications network or its components...” EX1010, [0003], [0035], [0036], [0052], [0054]. A POSITA would have understood that to facilitate technicians making that determination and identifying the point of failure or fault within the network it would have been natural to store identity and location information of network infrastructure components such as base stations (*records pertaining to one or more telecommunications carriers which identify infrastructure and location information*) in Aaron’s database.

- (4) **20[a][ii] records for one or more end users which identify telecommunications assets or property assets owned or controlled by said one or more end users, and**

279. The combination renders obvious this limitation. In my opinion, Daley discloses the claimed end user database records and telecommunications assets associations.

280. Daley’s database includes records (e.g., names and contact information) for subscribers to the wireless carrier network (*records for one or more end users*). EX1009, [0217], [0221]-[0227] (the database includes subscriber

properties such as name and contact information). A POSITA would have recognized that these subscriber records establish the foundational data model for associating network usage, performance metrics, and diagnostic information with specific end users. The inclusion of contact information enables customer support interactions and targeted communications regarding service issues or improvements.

281. Furthermore, the database also includes records *which identify* an association between a subscriber and “one or more electronic devices,” *i.e. telecommunication assets ... owned or controlled by said ... end user[]*. EX1009, [0217], [223]; *see also*, EX1005, 9-10 (where patent owner identifies “[a] fleet of mobile devices owned or controlled by end users” for this limitation). This device-to-subscriber mapping represents a critical relationship that enables the system to correlate device-level diagnostic data with specific user accounts. A POSITA would have understood that this association mechanism supports multiple use cases—attributing performance issues to specific users, managing device inventories per subscriber, and enabling user-specific troubleshooting workflows.

282. Additionally, Figure 9 displays “an exemplary web page user interface 900 for editing entries in a database of Subscribers,” and includes an association of the subscriber to a mobile device. EX1009, Fig. 9. This interface demonstrates the practical implementation of subscriber-device relationships within the database management system. Through this user interface, authorized personnel can

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establish, modify, and maintain the associations between end users and their devices, ensuring accurate attribution of collected performance data. The technical architecture enables tracking multiple devices per subscriber and maintaining historical device associations as users upgrade or change equipment. Therefore, Daley fully discloses database records for end users and their associated devices, rendering this claim obvious.

The screenshot shows a web browser window with the address bar displaying a URL from 'samsung.com'. The page title is 'Edit Subscriber'. On the left is a sidebar with navigation links: 'Home', 'Subscriber', 'New Subscriber', 'Edit Subscriber', 'Import Subscriber', 'Device', and 'Time Statistics'. The main content area contains a form for editing subscriber information. The form has fields for 'First Name' (Karen), 'Last Name' (Chan), 'Mobile Number' (+14168293682), 'Email', 'City', 'Province', 'Country', 'Postal Code', and 'Subscriber Class' (Mobile). Below the form is a table titled 'Devices' with columns: 'Last Known Device', 'Device ID (IMEI/ESN)', and 'Device Type'. The table contains two rows of data, both for 'Treo 650' devices. A red box highlights the 'Devices' table, and a callout points to it with the text 'Records of devices ... owned or controlled by the subscriber'. At the bottom of the form are 'Delete' and 'Save' buttons. The footer shows 'User: karen@tizen', 'Name: Karen Chan', and 'Logged in at: 17/10/2005 12:52:47'.

Last Known Device	Device ID (IMEI/ESN)	Device Type
	IMEI:004420010940420	Treo 650
	IMEI:00440000836725	Treo 650

283. Furthermore, Daley’s database records also include “the Device IMEI/ESN, Manufacturer, [and] Model” (EX1009, [0291]), which *identify... telecommunications assets*. In my opinion, these device identifiers provide comprehensive technical characterization of each mobile device in the system. A POSITA would have recognized that the IMEI/ESN serves as a globally unique

identifier that distinguishes devices across the entire network, while the Manufacturer and Model information specifies the device's technical capabilities and characteristics.

284. The technical significance of maintaining these identifiers extends beyond simple device tracking. The IMEI/ESN enables precise correlation of performance data with specific hardware units, facilitating identification of device-specific versus network-wide issues. Additionally, the Manufacturer and Model data allows the system to account for device-specific behaviors, capabilities, and known issues when analyzing performance metrics. Through this multi-dimensional device identification framework, the database can support sophisticated analytics that differentiate between problems arising from specific device models, manufacturer-specific implementations, or individual hardware failures. Therefore, Daley's inclusion of IMEI/ESN, Manufacturer, and Model data fully establishes device identification within the database records.

- (5) 20[a][iii] public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic**

**locations, and information about carriers
serving said geographic locations;**

285. The combination renders obvious this limitation. In my opinion, the integrated teachings of these references disclose the claimed public records database elements.

286. Aaron discloses creating and updating “quality of service maps” (which include “all types of maps and similar depictions relating to a wireless communications system”) (EX1010, [0021]) and using such maps to, *inter alia*, assess network infrastructure (EX1010, [0036]). A POSITA would have understood that Aaron’s maps included contextual ***public records***, such as ***mapping information for the geographic locations*** within the quality of service map, because without that information a technician could not reasonably correlate the mapped quality of service with a location or infrastructure.

287. To the extent not disclosed by Aaron, common sense would have motivated the inclusion of such information in the quality-of-service maps for the same reason. *Id.* This type of information was commonly available via government websites, including those provided by the United States Geological Survey and Environmental Protection Agency, as well as similar state agencies, starting in the mid-1990s. *See, e.g.*, EX1035 at 262-272. Because Aaron discloses that information related to the quality of service maps is stored in a central database (EX1010, [0037]), and because a database would be a logical and well-known place to store

this information even without that disclosure, a POSITA would have found it obvious to include this information in the database of the combination. Moreover, storing an entire subset of that public in the database would make recurrent use faster (because of the local storage) and improve availability (e.g., if the remote record source were unavailable).

288. In addition, if needed (e.g., when Aaron's system is maintained outside of a particular carrier), a POSITA would have found it straightforward to source base station information, including location and associated carrier (*information about carriers serving said geographic locations*), from public records such as the FCC's Antenna Structure Registration (ASR) system. See EX1021; EX1022; EX1023; EX1024. For at least the reasons set forth in the previous paragraph, a POSITA would have found it obvious and straightforward to include these public records in the combination's database.

289. Also, Aaron contemplates the impact of "environmental changes (e.g., new building construction, new metallic objects such as fences, etc.)" on quality of service at particular locations. EX1010, [0002].

290. A POSITA would have recognized the benefit of supplementing Aaron's maps with addresses to identify potential buildings or other environmental factors and to use public *mapping* and *zoning information* to maintain current information about environment changes. This environmental awareness enables

predictive modeling of signal propagation changes and proactive identification of coverage degradation risks. For at least the reasons set forth in ¶287, a POSITA would have found it obvious and straightforward to include these public records in the combination's database.

291. Moreover, Scherzer discloses the database maintaining location information for access points that include *public records* via “wireless regions” defined by “cities, parks, groups of cities, states and other geographical areas of interest” (*mapping information for said geographic locations*). EX1011, [0131]. These geographic designations leverage publicly defined boundaries and administrative divisions to organize network infrastructure data in meaningful geographic contexts.

292. As set forth above, a POSITA would have found it obvious to combine these aspects of Aaron and Scherzer with Daley. Therefore, the combination fully discloses databases containing public records with mapping and zoning information, and carrier service data for geographic locations.

- (6) **20[b] one or more electronic interfaces to said one or more computers which permit performance or quality of service information obtained from one or more mobile or fixed devices that are located in one of said one or more specific locations to be automatically or manually updated into said database, and which permits at least one of said one or more telecommunications carriers or said one or more end users or one or more parties which are not**

telecommunications carriers or end users to review, catalog or sort information in said database; and

293. The combination renders obvious this limitation. In my opinion, Daley discloses the claimed updating mechanisms through multiple data collection and transmission pathways and the claimed functionalities of reviewing, cataloging, and sorting information in the database.

294. Daley discloses continuously collecting diagnostic and tracing log data from mobile devices to *updat[e]* the database. EX1009, [0039]. A POSITA would have recognized that this continuous collection mechanism ensures the database maintains current operational intelligence reflecting real-time network conditions and device states. Further, *updating* the collected data *in said database* may be triggered by: “[l]og data reaching a pre-specified log message threshold,” “[a] message matching specific filter criteria,” or “[p]eriodic triggers, based on a configured time interval” (*automatically*). EX1009, [0084]-[0088], [0151]-[0156].

295. These automatic triggering mechanisms implement intelligent data collection strategies—threshold-based triggers ensure critical data capture, filter-based triggers prioritize high-value diagnostic events, and periodic triggers guarantee regular status updates regardless of event occurrence. The technical implementation of these diverse trigger types enables the system to balance data freshness with network efficiency.

296. Additionally, updates may also be done *manually*, e.g., at the request of a customer service representative (EX1009, [0038]) or through a web page that allows a user to trigger the upload of collected data (EX1009, [275], [0297]). A POSITA would have understood that these manual triggering capabilities provide on-demand diagnostic data collection for troubleshooting specific issues or responding to customer complaints. The dual availability of automatic and manual update mechanisms ensures comprehensive data collection coverage across both routine monitoring and exceptional diagnostic scenarios.

297. Further, the data is sent to the diagnostic server (*said one or more computers*) over the air via the cellular network and using HTTP, that is, a web interface (*one or more electronic interfaces*), to provide data to the database servers and associated systems. EX1009, [0205], [0242]. The diagnostic server can be configured in flexible ways to encompass the monitoring and diagnostic functions including collecting logged information from mobile devices. EX1009, [0071]-[0072]. The utilization of HTTP protocols over cellular data connections represents a standard web services architecture that enables convenient, reliable, secure data transmission from distributed mobile devices to centralized servers. A POSITA would have recognized that this electronic interface implementation leverages existing internet infrastructure and established communication protocols to facilitate seamless database updates without requiring specialized transmission mechanisms.

Therefore, Daley fully discloses updating the database both automatically and manually using electronic interfaces to the computers.

298. Moreover, Daley discloses *permitting* customer service representatives and engineers (*one or more telecommunications carriers*) to review “tracing data transferred by the electronic device 107 to the diagnostic server 129” (*to review, catalog, or sort information in said database*) and diagnose problems “for subsequent corrective steps.” EX1009, [0038], [0060]. A POSITA would have recognized that these access permissions enable authorized personnel to leverage collected diagnostic data for troubleshooting and problem resolution purposes.

299. Daley also discloses that such a user may review and search diagnostic and trace data. EX1009, [0119], [0254]. The search functionality transforms the database from a passive repository into an active diagnostic tool, enabling users to identify specific error patterns, locate relevant log entries, and correlate events across multiple data dimensions. This capability facilitates efficient problem diagnosis by allowing technicians to quickly isolate relevant information from potentially vast quantities of diagnostic data.

300. Additionally, Daley’s system includes web page interfaces that allow a mobile subscriber to *review, catalog, or sort information*. EX1009, [0273]-[0274], [0290]-[0291], Figs. 15-17. These web-based interfaces provide comprehensive data manipulation capabilities—reviewing enables quality assessment, cataloging

supports systematic organization, storing facilitates data persistence, viewing allows information access, using enables analytical applications, and sorting permits prioritized examination of critical issues. A POSITA would have understood that Figures 15-17 illustrate practical implementations of these interfaces, demonstrating how users interact with performance metrics, diagnostic logs, and quality indicators through intuitive graphical presentations.

301. Therefore, Daley fully discloses permitting its users, including telecommunications carriers and mobile subscribers, to review, catalog, or sort the database information through its comprehensive user interface system.

(7) 20[c] one or more applications operable with said one or more mobile or fixed devices or said one or more computers for obtaining and providing said performance or quality of service information to said one or more electronic interfaces.

302. The combination renders obvious this limitation. In my opinion, Daley discloses the claimed mobile device application functionality.

303. Daley discloses a diagnostic client (*application[] operable with said one or more mobile ... device[]*) that collects diagnostic and trace data (*obtaining said performance or quality of service information*). EX1009, Abstract, [0039]. A POSITA would have recognized that this diagnostic client represents a software application specifically designed to operate within the mobile device's operating

system environment, accessing device resources and network interfaces to capture operational metrics.

304. The technical implementation of this client application enables comprehensive data collection through integration with the mobile device's hardware and software subsystems. As discussed above regarding limitation 20[a], the data collected by the diagnostic client includes “network performance data” (*performance or quality of service information*). EX1009, [0041]. A POSITA would have understood that Daley's network performance data, as previously discussed above, encompasses multiple quality dimensions—signal strength measurements that quantify coverage adequacy, connection stability metrics that indicate service reliability, and throughput indicators that reflect actual user experience.

305. Furthermore, the diagnostic client's operation on the mobile device provides direct access to real-time performance measurements at the point of service consumption. This on-device collection capability ensures accurate capture of actual user-experienced conditions rather than network-estimated values. The client application continuously monitors network interfaces, radio subsystems, and connection states to build a comprehensive picture of service quality from the end-user perspective. Therefore, Daley's diagnostic client fully discloses an application

operable with mobile devices for obtaining performance and quality of service information.

306. Daley discloses the mobile device uploading, *i.e. providing*, the *performance or quality of service information* to the diagnostic server and its database. EX1009, [0039]. A POSITA would have recognized that this upload functionality establishes the critical data flow from distributed collection points to centralized analysis infrastructure. Furthermore, Daley describes a “Log Transfer Module” of the diagnostic client for “moving log messages from internal log memory to one or more external recipients.” EX1009, [0127]. This modular architecture separates data collection from transmission, enabling flexible buffer management and optimized network utilization.

307. The technical implementation employs standard network protocols for reliable data delivery. For example, the transfer module may “transfer[] the data to the diagnostic/trace server OTA using TCP/IP” (*to said one or more electronic interfaces*). EX1009, [0180]-[0181]. A POSITA would have understood that TCP/IP transmission over-the-air represents a robust communication mechanism that ensures reliable, ordered delivery of diagnostic data despite potentially unreliable wireless network conditions.

308. Additionally, as discussed in limitation 20[b], Daley discloses that data transmission occurs “over the air via the cellular network and using HTTP, that is, a

web interface” which constitutes the electronic interface for data provision.

EX1009, [0205], [0242]. The combination of TCP/IP transport protocols with HTTP application-layer protocols identifies a comprehensive electronic interface system that supports based on lower-level data transmission and higher-level web service interactions. Through this interface, the diagnostic client can reliably provide collected performance and quality of service information to the server infrastructure. Therefore, Daley fully discloses providing performance and quality of service information to the *electronic interfaces*.

- b) Claim 21. The clearinghouse system of claim 20 wherein said one or more electronic interfaces provides performance or quality of service information to one or more mobile or fixed devices that are located in or will be located in said specific locations.**

309. The combination renders obvious claim 21. In my opinion, the teachings of Daley establish bidirectional communication capabilities between mobile devices and the server infrastructure. Additionally, Scherzer similarly teaches providing performance or quality of service information to mobile devices based on their geographic location.

310. Daley discloses that the client software running on the user’s mobile device supports protocols that are bidirectional and therefore allow for the receipt of information from the server. EX1009, [0205] (discussing TCP/IP, HTTP, and SMS support). A POSITA would have recognized that these standard communication

protocols inherently support two-way data exchange, enabling mobile devices to both transmit diagnostic data and receive configuration updates or performance information. Furthermore, Daley discloses configuring the device-resident software in response to, *e.g.*, messages from the server. EX1009, [0209], [0213]-[0214]. This server-initiated configuration capability demonstrates the practical implementation of bidirectional communication for remote device management.

311. Additionally, Daley discloses that the recited *performance or quality of service information* is made available via, *e.g.*, a “self-care website/portal 167” (*one or more electronic interfaces provides*). EX1009, [0033], Figs 15-18. The self-care portal transforms collected diagnostic data into user-accessible intelligence, enabling subscribers to monitor their own service quality. A POSITA would have understood that a user of Daley’s self-care website might also be a subscriber, *e.g.*, “a mobile account owner in a wireless carrier network,” and that such a user might use his or her own *mobile or fixed device*, which would also be an *end user device* to access the self-care website. EX1009, [0217].

312. The technical implementation creates a closed-loop system where devices both contribute data and consume analyzed results. Moreover, such devices *are located in or will be located in said locations* because the devices, when connecting to the network to access the website, would also be providing the information that would be displayed on that website. This architectural symmetry

ensures that users receive location-relevant performance information corresponding to their actual or anticipated service areas. A POSITA would thus have understood that Daley renders obvious the limitations of claim 21.

313. Moreover, Scherzer discloses sending collected information to mobile devices, including sending “data relating to AP’s in the client’s general neighborhood (*devices that are located in said specific locations*).” EX1011, [0072]. This location-aware information distribution ensures efficient bandwidth utilization by transmitting only geographically relevant data to each device.

314. Scherzer also discloses allowing the user to request “an update of available AP’s” for a future destination’s geographical area (*devices that... will be located in said specific locations*) if the user intends to take a trip to that destination. EX1011, [0072]. A POSITA would have recognized that this predictive information provisioning enables users to prepare for travel by pre-loading performance and availability data for their intended destinations. Therefore, Scherzer also fully establishes providing performance and quality information to end user devices at current or future locations.

c) Claim 22. The clearinghouse system of claim 20 wherein said performance or quality of service information includes multiple bands and multiple carriers.

315. The combination renders obvious claim 22. In my opinion, Daley discloses the claimed multi-band and multi-carrier information collection.

316. As set forth above, Daley's diagnostic and trace data (*said performance or quality of service information*) includes information from multiple devices. EX1009, [0286]-[0290], Fig. 17. The information is tied to a carrier's cellular network type, for example, "characterized by an IMEI/ESN." EX1009, [0217]. These device identifiers enable the system to differentiate between device types, models, and capabilities when analyzing performance data. A POSITA would have understood that different devices support different network technologies and frequency bands, making device identification essential for accurate performance attribution.

317. Additionally, the data includes, *inter alia*, "signal strength" collected across multiple devices, which is *performance or quality of service information includ[ing] multiple bands* because individual devices may use multiple bands and different devices may use different bands. The wireless networks contemplated by Daley may operate at different frequency bands. EX1009, [46]-[50], Fig. 2. A POSITA would have recognized that comprehensive signal strength measurements necessarily encompass multiple frequency. *Id.*

318. The collection of *information* from *multiple bands* enables carriers to optimize spectrum utilization, identify band-specific coverage gaps, and diagnose frequency-dependent interference issues. Therefore, Daley's system that collects

performance and quality information from multiple devices inherently includes information from multiple frequency bands, fully disclosing this limitation.

- d) **Claim 23. The clearinghouse system of claim 20 further comprising means for sending instructions from one of said one or more electronic interfaces to one or more wireless devices for configuring or reconfiguring said one or more wireless devices based on a ranking of performance or specific requests of an end user.**

319. The combination renders obvious claim 23. In my opinion, Daley discloses the claimed means for instructions provisioning based on a user's request.

320. Regarding the claimed function, Daley describes sending "provisioning information" to a mobile device to "correct configuration problems or to reconfigure software and hardware of the electronic device 107" (*sending instructions ... for configuring or reconfiguring said ... wireless device[]*). EX1009, [0037]; *see also* EX1009, [0050], [0082]. A POSITA would have recognized that this provisioning mechanism represents a fundamental remote management capability that enables network operators to optimize device performance without physical intervention. The technical implementation involves transmitting configuration parameters that reconfigure software or hardware to modify device behavior, network settings, or operational characteristics based on diagnostic findings or changing network requirements.

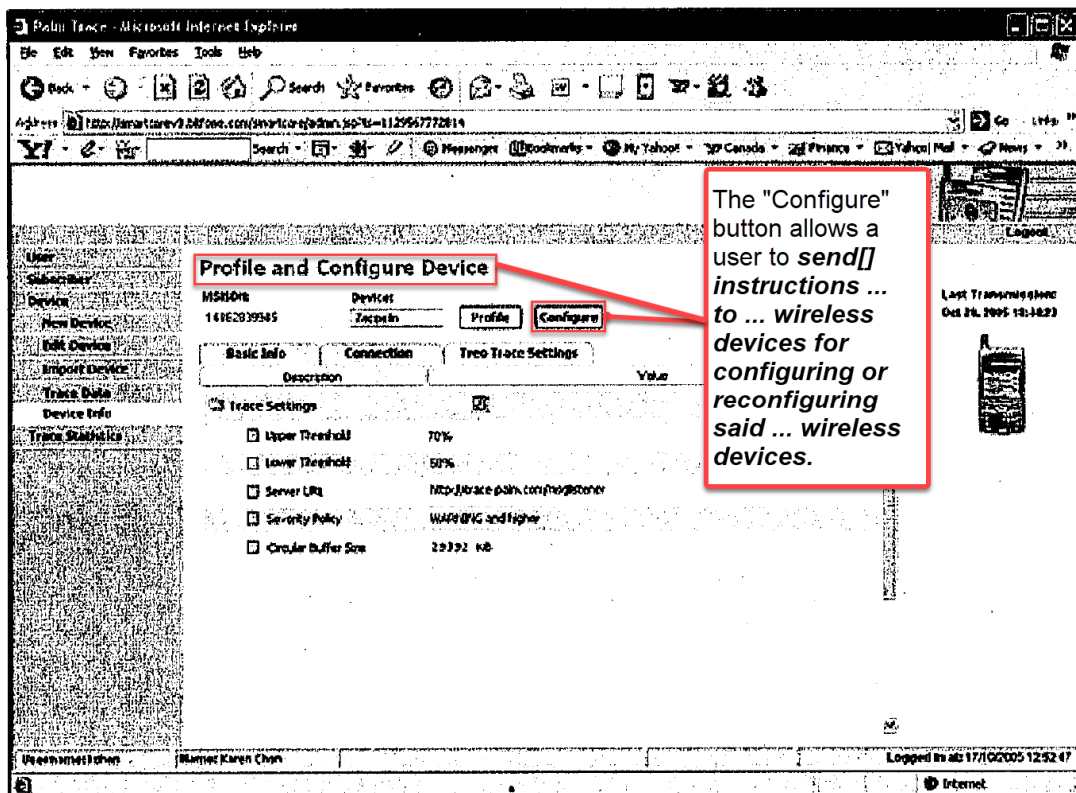
321. A POSITA would have understood that the ability to send reconfiguration instructions transforms the system from a passive monitoring platform into an active management solution. The provisioning information can address various operational aspects—network access parameters, radio frequency settings, application configurations, and service enablement flags. Through these configuration instructions, the system can implement corrective actions identified through diagnostic analysis, optimize device settings for specific network conditions, or enable new services and features remotely.

322. Daley describes a customer using the customer's mobile device to "request customer care service via a customer care server 157." EX1009, [0038]. A POSITA would have recognized that this customer-initiated service request establishes the causal chain that triggers subsequent configuration actions. As a result, the customer care server may send the provisioning information to the mobile device. EX1009, [0037]. This responsive configuration mechanism ensures that device adjustments directly address the specific issues raised by the end user.

323. Furthermore, Daley discloses a web interface (*said one or more electronic interfaces*) by which a support technician (who a POSITA would have understood could also be a subscriber using a device on the carrier's network) may "click on 'Configure Device' to send the configuration changes to the device." EX1009, [0298], [0301], Fig. 18. The technical implementation of this interface

enables authorized users to initiate configuration changes through simple web-based interactions.

324. A POSITA would have understood that the resulting *sending instructions* is **based on** the subscriber service request (*specific requests of an end user*). The causal relationship between the end user's service request and the subsequent configuration instructions demonstrates a responsive management system that addresses user-reported issues through targeted device reconfiguration. This user-driven configuration workflow ensures that device modifications align with actual user needs rather than theoretical optimization goals.



325. In my opinion, the structure performing the function is Daley's customer care server. Daley's "provisioning information" is sent from a "customer care server 157" or "a provisioning server." EX1009, [0037], [0308]. Daley's customer care server and diagnostic server "may be co-resident." EX1009, [0033], Fig. 1. A POSITA would have understood the functionalities of the customer care server could be integrated into the diagnostic server or implemented as a standalone server. Either way, the customer care server satisfies the *one or more computers* limitation previously discussed with respect to the diagnostic server.

- e) **Claim 24. The clearinghouse system of claim 20 further comprising means for sending a rank ordering of available telecommunications services from one of said one or more electronic interfaces to one or more wireless devices.**

326. The combination renders obvious this claim. In my opinion, Scherzer discloses the means for sending rank ordering of access point information to mobile devices.

327. Regarding the claimed function, Scherzer discloses providing a geographical map of locations that have access points and an indication of the quality ranking of each access point (*rank ordering of available telecommunications services*) on the map. EX1011, [0149]-[0150]. A POSITA would have recognized that this visual ranking presentation transforms raw quality metrics into actionable connection guidance. The geographic visualization enables users to understand both

the spatial distribution of available access points and their relative performance characteristics, facilitating informed connection decisions based on location and quality considerations.

328. Further, this *rank ordering* is provided *to one or more wireless devices* “when the server determines the location of the mobile device of the user.” EX1011, [0150]. The technical implementation of this location-specific ranking adjusts access point priorities based on the device's current position, accounting for distance, signal propagation characteristics, and historical performance from that location. A POSITA would have understood that this dynamic ranking mechanism optimizes connection recommendations by considering both absolute quality metrics and location-relative factors such as signal path loss and interference patterns.

329. The ranking system enables devices to systematically evaluate connection options, prioritizing high-quality access points while avoiding problematic ones. Through this rank-ordered presentation, users receive clear guidance on optimal connectivity choices without needing to interpret complex technical metrics. As set forth above, a POSITA would have found it obvious to implement this aspect of Scherzer in the system of Daley, thereby creating a comprehensive management system that provides rank-ordered telecommunications service information to wireless devices.

330. The corresponding structure for performing the function is, e.g., Daley's server (see claim 23, *supra*) modified to send the rank ordering. EX1011, [0149]-[0151].

- f) **Claim 25. The clearinghouse system of claim 20 further comprising a monitoring application which permits monitoring of radio operating conditions of one or more wireless devices, wherein monitored radio operating conditions are used to update performance or quality of service information in said database.**

331. The combination renders obvious this claim. In my opinion, Daley discloses the claimed monitoring and database update functionality.

332. Daley's diagnostic client "executes specific diagnostic tasks such as... collecting network performance data" (*monitoring radio operating conditions of one or more wireless devices*). EX1009, [0041]. A POSITA would have recognized that collecting network performance data inherently requires monitoring radio operating conditions, as these conditions directly determine network performance characteristics. The radio operating environment encompasses signal propagation, interference levels, and channel quality—all fundamental factors affecting wireless communication performance.

333. For example, signal strength is monitored and reported. EX1009, [0270], [0291]. Signal strength measurements represent a primary radio operating condition that directly impacts service quality, data throughput, and connection

reliability. A POSITA would have understood that monitoring signal strength provides continuous assessment of the radio frequency environment experienced by mobile devices, enabling detection of coverage issues, interference problems, and network degradation.

334. Further, the data is then used *to update* the above-describe *performance or quality of service information* stored *in the database*, as discussed above regarding limitation 20[b]. This update mechanism creates a feedback loop where real-time radio monitoring continuously refreshes the database with current operating conditions. The technical implementation ensures that the database maintains an accurate representation of network performance by incorporating the latest radio operating measurements from distributed mobile devices. Through this continuous monitoring and updating process, the system tracks evolving radio conditions across the network, enabling both reactive troubleshooting and proactive optimization. Therefore, Daley fully discloses monitoring radio operating conditions for mobile devices to update the performance and quality of service information in the database.

335. Moreover, a POSITA would have known that either the diagnostic client on the mobile device (*see* claim 26, *infra.*, when the mobile device is part of the clearinghouse) or the counterpart software on the server (for receiving and

processing the data from the diagnostic client) or both satisfy the *monitoring application* limitation.

- g) **Claim 26. The clearinghouse system of claim 20 further comprising one or more wireless devices which are configured to provide said performance or quality of service information to one of said one or more of said electronic interfaces.**

336. See claim 20. In my opinion, the combination renders obvious claim 26 by including the mobile devices taught by Daley in the clearinghouse system.

F. Ground 5: Daley, Aaron, Scherzer, Chmaytelli, and optionally Dawson (Claims 27-32)

1. Combination, Motivation, and Reasonable Expectation of Success

337. This is the combination, optionally including Dawson, of Ground 4, modified to include ad-related features as taught by Chmaytelli.

338. In my opinion, a POSITA would have been motivated to combine Chmaytelli with the Daley+Aaron+Scherzer combination. There was widespread interest in the wireless communications industry to include location-targeted mobile advertising at the time and various technologies were developed by major players to provide viewer friendly ads suitable for compact-sized mobile devices. For example, IBM developed a webserver that selects advertising objects for web pages depending on the user's geographic location and time of day, packages ads and encrypted coupons, and delivers them to mobile web clients. EX1028, Abstract, 2:36-3:36, 6:43-7:52. Figs. 2-6. Cisco developed a mobile advertisement system

that presents highly focused ads selected by combining location, time, and audience, or a “dynamic billboard” for devices having location tracking capabilities such as vehicles and mobile phones. EX1029, 1:31-2:15, 2:38-4:37, Figs. 2-4. Motorola leveraged global positioning services and Internet access to provide location-based advertising to vehicles. EX1030, [0017]-[0018], [0036], [0063]-[0064], [0108]-[0130], Figs. 6-9. Security and identity protection measures were also developed in connection with provision of location-based advertising to mobile users. EX1031, 3:23-4:16, 5:50-6:3, 6:52-7:28, 16:27-18:30, 21:5-22:12, Figs. 4-7.

339. Advertising was widely recognized as an attractive additional revenue stream or a way to offer network services at less cost. And location-specific advertising was understood to be more likely be viewed and to result in conversions.

340. A POSITA would therefore have recognized the potential value of adding localized ad serving capabilities to the combination of Ground 4, which already collected location information from devices and already transmitted data (e.g., configuration instructions) to them. For example, Scherzer discloses providing a ranked list of Wi-Fi access points to a user, which were typically stationed at shops, cafes, bookstores, etc. Those locations are natural points of commerce and ideal for dissemination of local, time-sensitive promotions. Further, those local merchants are incentivized to pay for placement in an AP recommendation list that attracts customers who are using Wi-Fi services. The advertising revenue can in turn

subsidize the Scherzer system by reducing subscription and Wi-Fi access costs and thereby help expand its customer base.

341. A POSITA would have had a reasonable expectation of success in implementing the combination. The underlying combination of Ground 4 already disclosed providing location-specific information to mobile devices, including AP information at the device's location. EX1011, [0061], [0070]. It would have been straightforward to serve another type of content (ads) in the same fashion, as disclosed in Chmaytelli.

2. Analysis

a) Claim 27

- (1) 27[pre] A content providing system which provides selected content to one or more mobile or fixed devices located in specific locations, comprising:**

342. To the extent the preamble is limiting, the combination renders it obvious. In my opinion, the Daley+Aaron+Scherzer combination discloses mobile device location tracking capabilities and Chmaytelli further teaches localized ad delivery.

- (2) 27[a] a clearinghouse system for communications networks, said clearinghouse system including**

343. *See* Ground 4, limitation 20[pre].

- (3) 27[a][i] one or more computers which interfaces with a database, said database including one or more of**

344. *See* Ground 4, limitation 20[a][i].

- (4) 27[a][i][1] performance or quality of service information for one or more specific locations,**

345. *See* Ground 4, limitation 20[a].

- (5) 27[a][i][2] records for one or more telecommunications carriers which identify infrastructure and location information for one or more specific locations,**

346. *See* Ground 4, limitation 20[a][i].

- (6) 27[a][i][3] records for one or more end users which identify telecommunications assets or property assets owned or controlled by said one or more end users, and**

347. *See* Ground 4, limitation 20[a][ii].

- (7) 27[a][i][4] public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic locations, and information about carriers serving said geographic locations; and**

348. *See* Ground 4, limitation 20[a][iii].

- (8) 27[a][ii] one or more electronic interfaces to said one or more computers which permit one or more mobile or fixed devices to be connected to said clearinghouse system, said one or more**

electronic interfaces permitting one or more of performance or quality of service information obtained from said one or more mobile or fixed devices that are located in one of said one more specific locations to be automatically or manually updated into said database, and

349. *See* Ground 4, limitation 20[b].

(9) 27[a][iii] at least one of said one or more telecommunications carriers or said one or more end users or one or more parties which are not telecommunications carriers or end users to review, catalog or sort information in said database;

350. *See* Ground 4, limitation 20[b].

(10) 27[b] wherein a geographic location of one or more mobile or fixed devices is identified; and

351. The combination renders obvious this limitation. In my opinion, Aaron discloses location identification of a mobile device.

352. Aaron teaches *identifying a geographic location* of a *mobile device* by multiple methods such as “via a Global Positioning System (GPS) receiver in the wireless terminal, via triangulation methods using measurements from multiple base stations, or by determining a geographical location of a base station with which the wireless terminal has a radio link.” EX1010, [0042].

(11) 27[c] one or more local ad servers in communication with said one or more electronic interfaces of said clearinghouse system configured to use said geographic location, said

**local ad servers providing localized content to
said one or more mobile or fixed devices.**

353. The combination renders obvious this limitation. In my opinion, Chmaytelli in this combination teaches this limitation, as discussed in Ground 3, claim 14, *supra*. Chmaytelli's teaching of regarding the same claimed features in the Ground 3 combination similarly applies to this combination.

**b) Claim 28. The content providing system of claim 27
further comprising one or more base stations in
communication with said one or more electronic
interfaces of said clearinghouse system.**

354. The combination renders obvious claim 28. In my opinion, Aaron in this combination teaches the additional limitation of claim 28, as discussed in Ground 3, claim 15, *supra*. Aaron's teaching of regarding the same claimed features in the Ground 3 combination similarly applies to this combination.

**c) Claim 29. The content providing system of claim 27
wherein said local ad servers provide web page view
and usage statistics to said database of said
clearinghouse system through said one or more
electronic interfaces.**

355. The combination renders obvious claim 29. In my opinion, Chmaytelli in this combination teaches the additional limitation of claim 29, as discussed in Ground 3, claim 16, *supra*. Chmaytelli's teaching of regarding the same claimed features in the Ground 3 combination similarly applies to this combination.

**d) Claim 30. The content providing system of claim 27
wherein said means for identifying a geographic**

location includes a GPS associated with each of said one or more mobile or fixed devices.

356. The combination renders obvious claim 30. In my opinion, Aaron in this combination teaches the additional limitation of claim 30, as discussed in Ground 3, claim 30, *supra*. Aaron's teaching of regarding the same claimed features in the Ground 3 combination similarly applies to this combination.

e) Claim 31. The content providing system of claim 27 wherein said means for identifying a geographic location includes a means for determining one more of towers and frequencies being used by said one or more mobile or fixed devices.

357. The combination renders obvious claim 31. In my opinion, Aaron in this combination teaches the additional limitation of claim 31, as discussed in Ground 3, claim 31, *supra*. Aaron's teaching of regarding the same claimed features in the Ground 3 combination similarly applies to this combination.

f) Claim 32. The content providing system 27 wherein said local ad servers provide content to said one or more mobile or fixed devices tuned to a specific transmitted signal.

358. The combination renders obvious claim 32. In my opinion, Chmaytelli in this combination teaches the additional limitation of claim 32, as discussed in Ground 3, claim 32, *supra*. Chmaytelli's teaching of regarding the same claimed features in the Ground 3 combination similarly applies to this combination.

G. Ground 6: Scherzer (and optionally Dawson) (Claims 20-25)

1. Claim 20

a) 20[pre] A clearinghouse system for communications networks, comprising:

359. To the extent the preamble is limiting, Scherzer discloses a server and database for, *e.g.*, intermediaries such as IT administrators of the network server, to evaluate the quality of connections of mobile devices to radio access points for wirelessly connecting to a broadband network for access to Internet-based services, *i.e.*, a ***clearinghouse for communications networks***. EX1011, Abstract, [0027], [0066]. In my opinion, this system implements comprehensive clearinghouse functionality by centralizing access point information and quality metrics for distribution to multiple stakeholders.

360. Specifically, Scherzer's system includes a server that receives, stores, and updates "access point connection cache data from the network access point" and the access point connection quality data from mobile device for access points across geographic locations. EX1011, [0058], [0059]. A POSITA would have recognized that this bidirectional data collection creates a comprehensive repository of both infrastructure-reported and user-experienced quality metrics. The system uses the database records pertaining to access points to provide a geographic map of access points to mobile devices to assist the user in selecting a nearby access point. EX1011,

[0149]. This mapping functionality transforms raw database records into actionable geographic intelligence that guides access point connection decisions.

361. Furthermore, owners of access points register their access point with the system to allow other third-party users to connect to their access point for wireless Internet access. EX1011, [0147]. This registration mechanism establishes a marketplace where access point owners can share their infrastructure while users gain expanded connectivity options. A POSITA would have understood that this creates a clearinghouse ecosystem where the system mediates between infrastructure providers and connectivity consumers.

362. Therefore, Scherzer's server and database serve as a *clearinghouse* that meets claim 1's limitation as disclosed above. The technical architecture aggregates distributed information, processes quality metrics, and disseminates connection guidance to multiple parties, embodying the essential characteristics of a telecommunications clearinghouse.

363. In the alternative, if *clearinghouse* refers to a system that facilitates the procurement of property and infrastructure for a telecommunications system, then it is rendered obvious by the combination of Scherzer and Dawson. *See* Ground 5, *supra*. For example, Dawson's integrated database system 800 organizes sales activities for telecommunication assets including properties where wireless telecommunication infrastructure can be deployed, such as buildings or roof rights.

EX1013, [0002], Figs. 1, 8. This procurement-focused clearinghouse addresses the business and legal aspects of infrastructure deployment.

364. Users such as real estate agents, property owners, fixed wireless communications service providers, or wireless service users can access, search, and update the contents of the database. EX1013, [0023]-[0025]. A POSITA would have recognized that this multi-stakeholder access model creates a transactional clearinghouse where supply and demand for telecommunications infrastructure converge. Through this platform, property owners can list available sites, carriers can identify deployment opportunities, and intermediaries can facilitate transactions.

b) 20[a] one or more computers which interface with a database, the database including performance or quality of service information for one or more specific locations, and one or more of

365. Scherzer discloses a server that *interface[s]* with a *database* that contains *performance* and *quality of service* information from mobile devices connecting to wireless access points. In my opinion, this server-database architecture establishes the fundamental infrastructure for collecting, storing, and processing network quality metrics.

366. Scherzer discloses a server (*one or more computers*) that receives “radio access point” connection quality measurements (*performance or quality of service information*) from mobile devices and stores it in a “radio resource database” (*database*), thereby *interface[ing] with the database*. EX1011, [0057]-[0059],

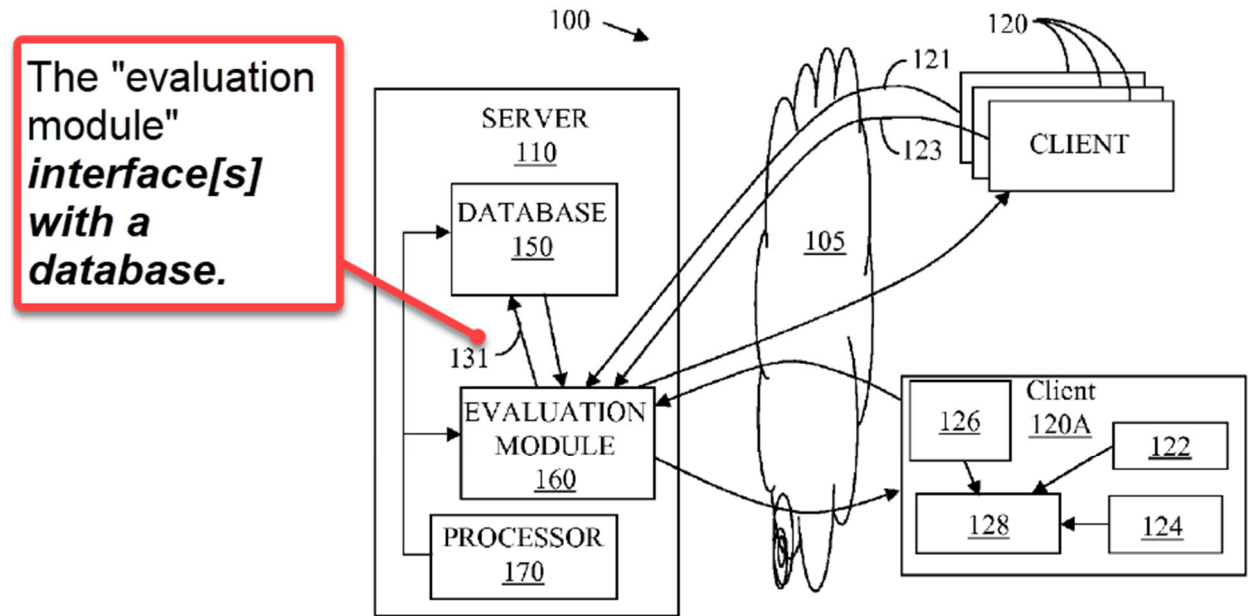
[0073], [0106], [0109]. A POSITA would have recognized that this server represents a computer system specifically configured to perform data collection, evaluation, and storage operations. The interface between the server and database enables bidirectional data operations—writing quality measurements received from mobile devices and reading stored metrics for analysis and distribution.

367. Further, Scherzer’s server includes an “evaluation module” “which evaluates accessibility and bandwidth of various AP’s, and store[s] the information as an update in database 110, as shown by arrow 131.” EX1011, [0068], Fig. 1. A POSITA would have understood that the arrow 131 in Figure 1 illustrates the data flow path from the evaluation module to the database, confirming the server’s interface operations.

368. The technical implementation of this interface supports multiple database operations including insertion of new quality measurements, updating of existing access point records, and retrieval of stored metrics for distribution to mobile devices. Through this comprehensive interfacing capability, the server maintains current quality information while enabling historical trend analysis.

369. Additionally, a POSITA would have understood that the above server and evaluation module functionalities can be fully integrated in a single system or distributed across different networked computers or some hybrid approach depending on performance, cost, or operational requirements. Any of such

configurations would satisfy *one or more computers, which interface with a database* as claimed.



370. In my opinion, Scherzer's radio resource *database* includes comprehensive *performance* and *quality of service* information related to a mobile device's wireless connection to an access point, e.g., "[b]ackhaul quality (estimated bandwidth connection to Internet)", "success rate," "average execution periods," [p]ercentage allowable shared bandwidth." EX1011, [0109]-[0117], [0148]. A POSITA would have recognized that these metrics collectively characterize the user's actual service experience—backhaul quality determines data throughput capacity, success rate measures connection reliability, execution periods reflect

latency characteristics, and bandwidth allocation indicates available network resources.

371. Further, Scherzer encodes access point connection quality data, into quality and accessibility vectors, which include connection quality, ease of accessibility, and location coordinates, in the database. EX1011, [0131]-[0140]. This vector-based encoding provides a multi-dimensional representation of service quality that captures both objective performance metrics and user-perceived accessibility factors. Through this comprehensive data model, the system maintains granular quality information that supports both technical analysis and user-facing recommendations.

372. Further, these quality measurements are associated with access points at *specific locations* and the measurements are gathered by mobile devices within range of that location. The spatial correlation between measurements and locations enables geographic analysis of service quality patterns. Scherzer's mobile devices determine their own *location* which is included in the data sent to the database. EX1011, [0082]-[0087], [0131]. Through this location-aware data collection, the system builds a geographically-indexed quality database that supports location-based services and spatial performance analysis.

373. As set forth in the next three subsections, Scherzer discloses the database *including one or more of* the recited records. To be clear, in my opinion,

this claim limitation recites three disjunctive elements (i)-(iii) and only one of the three is required to satisfy the limitation. Nonetheless, Scherzer discloses all three of them.

c) 20[a][i] records for one or more telecommunications carriers which identify infrastructure and location information for one or more specific locations,

374. Scherzer's database stores records include "AP Quality and accessibility (Q&A) vector" "based on *location* coordinates sorted to 'wireless regions'." EX1011, [0131]. In my opinion, these location-based quality vectors establish geographic indexing that enables spatial analysis of access point performance across defined regions. A POSITA would have recognized that organizing records by wireless regions facilitates efficient retrieval of location-relevant access points and enables regional performance comparisons.

375. Further, Scherzer's records include "name and MAC address of the network access point," which can be used to identify the service provider. EX1011, [29]-[0030], [0057]. The MAC address serves as a unique identifier that enables precise access point identification and correlation with service provider databases. Such providers include commercial service providers such as "Cloud, Google, and Metrofi." EX1011, [0013]. These records demonstrate the system's capability to track and evaluate infrastructure from multiple service operators.

376. Additionally, a POSITA would have understood that *telecommunication carriers* such as T-Mobile also offered broadband wireless services at the time and their access points would have been included in Scherzer's database. EX1026. The technical architecture of Scherzer's system makes no distinction between different types of service providers—any access point detectable by mobile devices would be captured in the radio surveys and measurement trips. As such, the access point *records* in Scherzer's database *identify infrastructure and location information for one or more specific locations*.

377. Through these comprehensive records, the database maintains both infrastructure identification (via MAC addresses and provider names) and precise location information (via coordinates and regional classifications). A POSITA would have understood that this dual identification mechanism enables the system to track carrier-specific infrastructure deployment patterns while providing location-based service quality assessments. Therefore, Scherzer's fully disclose database records for telecommunications carriers which identify infrastructure and location information for one or more specific locations.

- d) **20[a][ii] records for one or more end users which identify telecommunications assets or property assets owned or controlled by said one or more end users, and**

378. Scherzer discloses owners of access points registering their access point *(one or more of telecommunications assets ... owned or controlled by said one or*

more end users) for inclusion in the database of wireless access points. EX1011, [0147]. In my opinion, this registration mechanism establishes a formal process through which infrastructure owners contribute their assets to the shared network ecosystem. A POSITA would have recognized that registration creates both technical and administrative records necessary for managing shared telecommunications resources.

379. The registration process captures comprehensive asset information—technical specifications of the access point equipment, ownership details, and operational parameters. The information is stored in the *database* as *records for* the owner (*said one or more end users*) and the wireless access points. EX1011, [0147]. This dual-record architecture maintains clear associations between end users and their registered infrastructure assets.

380. A POSITA would have understood that these database records serve multiple critical functions. First, they establish ownership documentation that enables proper attribution of infrastructure assets. Second, they provide technical specifications necessary for compatibility assessment and performance evaluation. Third, they create an auditable trail of registered assets for administrative and security purposes. The technical implementation of this record-keeping system ensures that each access point in the database maintains traceable ownership while enabling the system to aggregate quality metrics across all registered infrastructure.

- e) **20[a][iii] public records which include, for a plurality of geographic locations, one or more of mapping information for said geographic locations, zoning information for said geographic locations, local ordinances for said geographic locations, contact information for government officials for said geographic locations, and information about carriers serving said geographic locations;**

381. Scherzer's database maintains geographic location information for wireless access points. In my opinion, this location data provides the spatial foundation necessary for location-based service delivery and geographic performance analysis. The access points are organized by "wireless regions" such as "cities, parks, groups of cities, states and other geographical areas of interest" (*mapping information for said geographic locations*), which are *public records for a plurality of geographic locations*. EX1011, [0131], [0149].

382. A POSITA would have recognized that these geographic organizational units—cities, parks, states—represent publicly-defined administrative and geographic boundaries established through governmental records and mapping authorities. The utilization of these public geographic designations ensures consistent, standardized regional definitions that align with user expectations and official jurisdictional boundaries. Furthermore, the inclusion of "other geographical areas of interest" demonstrates the system's flexibility to incorporate various public geographic classifications such as neighborhoods, districts, or census-designated areas. EX1011, [0131], [0149].

383. The technical implementation of this geographic organization enables efficient spatial queries and location-based filtering of access point data. By leveraging public geographic records and mapping information, the system ensures authoritative location data while avoiding the complexity of maintaining proprietary geographic definitions. Through this public records-based geographic framework, users can search for access points using familiar location references while the system maintains accurate spatial relationships between infrastructure elements.

- f) **20[b] one or more electronic interfaces to said one or more computers which permit performance or quality of service information obtained from one or more mobile or fixed devices that are located in one of said one or more specific locations to be automatically or manually updated into said database, and which permits at least one of said one or more telecommunications carriers or said one or more end users or one or more parties which are not telecommunications carriers or end users to review, catalog or sort information in said database; and**

384. Scherzer discloses the server continuously receiving access point connection quality data from mobile devices via *one or more electronic interfaces*. EX1011, [0072], [0080]. In my opinion, this continuous data reception creates a real-time feedback loop that ensures the database reflects current network conditions. The server uses these incoming measurements to *updat[e]* the database *automatically* such that “the database 150 is enhanced and continuously updated to include up to date data.” EX1011, [0072], [0080]. A POSITA would have

recognized that this automatic update mechanism reduces data staleness by incorporating fresh quality measurements as they arrive, ensuring users receive current rather than outdated connection guidance.

385. The technical implementation of automatic updates transforms the database from a static repository into a dynamic quality tracking system. Through continuous enhancement with real-world measurements, the database evolves to reflect changing network conditions, new access point deployments, and shifting usage patterns. This temporal responsiveness enables the system to adapt to environmental changes, infrastructure modifications, and evolving performance characteristics without administrative intervention.

386. Additionally, Scherzer discloses collecting access point connection quality data from mobile devices to *updat[e]* the database when the user *manually* connects to an access point through “an application control window.” EX1011, [0079]. This manual update pathway complements the automatic collection by capturing user-initiated connection events that might not trigger automatic reporting thresholds. A POSITA would have understood that providing both automatic and manual update mechanisms ensures comprehensive data collection across different usage scenarios—passive background monitoring captures routine operations while manual updates record explicit user actions and preferences.

387. Scherzer further discloses that the client program on mobile devices may “[p]rovide an updated radio resources geographical map with connection likelihood ... displayed on a laptop, PDA, cell-phone, etc., upon request.” EX1011, [0078]. A POSITA would have recognized that displaying connection likelihood on geographic maps enables users to make informed connectivity decisions.

388. Furthermore, this map *permit[s]* the mobile device’s user (*one or more end users*) to *review, catalog, or sort* the ranking of those nearby access points based on the connection quality data in the database. EX1011, [0149], [0150]. The technical implementation of this user interface provides comprehensive data manipulation capabilities—users can review quality metrics to assess options, catalog preferred access points for future reference, view geographic distributions of connectivity, use rankings to guide connection decisions, and view sorted access points by ranking.

- g) **20[c] one or more applications operable with said one or more mobile or fixed devices or said one or more computers for obtaining and providing said performance or quality of service information to said one or more electronic interfaces.**

389. Scherzer discloses a client program (*one or more applications operable with said one or more mobile ... devices*) executing on each mobile device that “executes radio measurements and report[s] to the network server.” EX1011, [0067]. In my opinion, this client program is a software application designed to

operate within the mobile device's operating environment while performing autonomous quality assessment functions. A POSITA would have recognized that the client program's ability to execute radio measurements demonstrates direct integration with the device's wireless subsystems, enabling access to low-level radio metrics typically unavailable to standard applications.

390. The client program “conduct[s] data acquisition” by periodically performing radio surveys and “measurement trips” that test the mobile device's connection quality to nearby access points (*obtain[s] said performance or quality of service information*). EX1011, [0080], [0082]-[0087], [0149]. These measurement trips involve systematic evaluation of available access points through controlled connection attempts and quality assessments. A POSITA would have understood that radio surveys scan the wireless spectrum to identify available access points, while measurement trips establish test connections to evaluate actual performance characteristics such as throughput, latency, and stability.

391. The periodic execution of these measurements ensures temporal coverage of varying network conditions throughout different times and usage patterns. Through this comprehensive data acquisition methodology, the client program captures both the availability landscape of access points and their empirical performance characteristics from the end-user perspective.

392. The mobile device communicates with the server and reports the measurements using the mobile device's Internet connection (*providing ... to said one or more electronic interfaces*). EX1011, [0067]. The utilization of the device's Internet connection as the communication pathway leverages existing data connectivity without requiring specialized transmission infrastructure. A POSITA would have understood that this Internet-based communication represents a standard electronic interface that employs established protocols for reliable data transmission between mobile clients and centralized servers. Through this electronic interface, mobile devices contribute their local quality assessments to the global database, transforming isolated measurements into comprehensive network intelligence accessible to all users.

2. **Claim 21. The clearinghouse system of claim 20 wherein said one or more electronic interfaces provides performance or quality of service information to one or more mobile or fixed devices that are located in or will be located in said specific locations.**

393. Scherzer discloses a database of *performance or quality of service information* for wireless access points assembled from measurements of wireless performance parameters received from mobile devices. EX1011, [0072]. In my opinion, this crowd-sourced database represents a comprehensive repository of empirical performance data collected from real-world usage scenarios. This *performance or quality of service information* is *provide[d]* to mobile devices as

part of each mobile device's "local database" that is used when the device is selecting which access point to connect to. EX1011, [0072]. A POSITA would have recognized that distributing quality information to local device databases enables intelligent connection decisions without requiring real-time server queries, improving both connection speed and reducing network overhead.

394. The local database provisioning ensures that mobile devices possess current quality metrics for making connection decisions. Through this distributed intelligence architecture, devices can evaluate available access points based on historical performance data rather than blind connection attempts.

395. Additionally, Scherzer discloses the *provid[ing]* the mobile devices with access point maps that include rankings of the access points nearby the mobile device's geographic location (*performance or quality of service information to one or more mobile ... devices that are located in or will be located in said specific locations*). EX1011, [0078]. These location-aware maps transform abstract quality metrics into spatially contextualized connection guidance, enabling users to visualize both the geographic distribution and relative quality of available access points.

396. Furthermore, the server communicates such information to the mobile device via the Internet (*to one of said one or more said electronic interfaces*). EX1011, [0068]. A POSITA would have understood that Internet-based

communication provides a standard, reliable channel for distributing quality information to mobile devices regardless of their current connection type or carrier network. This electronic interface leverages existing Internet protocols to ensure accessibility of the quality information across diverse device types and network configurations.

3. Claim 22. The clearinghouse system of claim 20 wherein said performance or quality of service information includes multiple bands and multiple carriers.

397. Scherzer discloses claim 22. In my opinion, Scherzer discloses the claimed records including multiple bands and multiple carriers.

398. Scherzer discloses the collection of access point information by performing an “802.11 scan” that “produces a list of access points in reach; for each intercepted access point radio signal strength indication (RSSI) is provided along with type of security status.”. EX1011, [0122].

399. A POSITA would have recognized that the WiFi configuration information collected in Scherzer would include the ***bands*** used by WiFi protocols and standards such as IEEE 802.11, such as specific radio channels within a frequency band (*e.g.*, 2.4 GHz, 5 GHz). EX1011, [0018], [0122]. The technical reality of WiFi operations requires devices to identify the specific channel (and therefore frequency) on which each access point operates—*e.g.*, channel 1 at 2.412 GHz, channel 6 at 2.437 GHz, or channel 36 at 5.180 GHz, for example. EX1027,

at 167, 262. Mobile devices need to tune their radios to the appropriate channel to establish connections with an access point.

400. Additionally, such information is stored in the server. As such, when the mobile device is connected to a particular access point, the server would be able to associate that access point with the records stored in its database and identify the *bands* used by the mobile device. This enables the server to track frequency utilization patterns, identify congested channels, and recommend optimal frequency selections based on historical performance data. A POSITA would have understood that this frequency determination capability provides essential information for spectrum management, interference avoidance, and connection optimization.

401. Further, as discussed above in limitation 20[a][i], Scherzer's records include *multiple carriers*.

4. Claim 23. The clearinghouse system of claim 20 further comprising means for sending instructions from one of said one or more electronic interfaces to one or more wireless devices for configuring or reconfiguring said one or more wireless devices based on a ranking of performance or specific requests of an end user.

402. Scherzer discloses claim 23. In my opinion, Scherzer discloses the claimed means for instructions provisioning based on a ranking of performance or specific requests of an end user.

403. Regarding the claimed function, Scherzer discloses a server sending access point connection cache information, including the name and MAC address of

an access point, to the mobile device. EX1011, [0120]. The mobile device “can use the information in the cache to easily connect to AP’s in the destination location.” EX1011, [0120]. Additionally, Scherzer discloses the database containing other access point configuration information shared with each mobile device for connecting to the access point. EX1011, [0119]. As such, the server *send[s] instructions to the wireless device for configuring or reconfiguring* it to an access point. The server communicates such information to the mobile device via the Internet (*from one of said one or more electronic interfaces*). EX1011, [0068].

404. Scherzer’s server provides the mobile device a geographical map indicating locations of access point with the “ranking of the access point with respect to the specific location” (*ranking of performance*), allowing the device to connect to an access point using that information. EX1011, [0149]-[0150].

405. Further, as discussed above in claim 21, Scherzer discloses providing the geographic map of access points at a geographic location on *specific request[] of an end user*.

406. The corresponding structure of the asserted combination is, e.g., Scherzer’s server 110. EX1011, [0068], Fig. 1. Scherzer’s server sends “radio resource information,” including “cache information of AP’s” to “user terminals” EX1011, [0120]-[0121].

5. Claim 24. The clearinghouse system of claim 20 further comprising means for sending a rank ordering of available

telecommunications services from one of said one or more electronic interfaces to one or more wireless devices.

407. See claim 23, *supra*, regarding the function and structure for providing the ranking of access points (*rank ordering of available telecommunications services*) to the mobile devices.

6. **Claim 25. The clearinghouse system of claim 20 further comprising a monitoring application which permits monitoring of radio operating conditions of one or more wireless devices, wherein monitored radio operating conditions are used to update performance or quality of service information in said database.**

408. Scherzer discloses a client program executing on the mobile device that *monitor[s] radio operation* conditions during “radio surveys” and “measurement trips” and “conduct[s] data acquisition.” EX1011, [0067], [0080]. In my opinion, these radio surveys and measurement trips represent systematic evaluation protocols that characterize the wireless environment through comprehensive signal analysis. A POSITA would have recognized that monitoring radio operating conditions involves measuring signal strength, interference levels, channel utilization, and other electromagnetic characteristics that determine communication quality.

409. The radio surveys scan the available spectrum to identify access points and assess their signal characteristics, while measurement trips establish test connections to evaluate actual performance under operational conditions. The access point connection quality information so acquired, *i.e. performance or quality*

of service information, is received at the counterpart software (*monitoring application*) at the server and used to *update* the *database*. EX1011, [0080].

410. A POSITA would have understood that this update mechanism creates a continuous feedback loop where field measurements refresh database records with current performance data. The transformation of monitored radio conditions into stored quality metrics enables the system to track temporal variations in access point performance, identify degradation trends, and maintain accurate quality assessments. Through this monitoring and updating process, the database evolves to reflect actual network conditions as experienced by mobile devices in the field.

V. Secondary Considerations of Non-Obviousness

411. I understand that so-called “secondary considerations” are legally relevant to an obviousness analysis. It is my opinion that the secondary considerations I consider here further weigh in favor of obviousness.

412. In my opinion, there is a lack of commercial success for any product practicing the challenged claims because I understand that the Patent Owner has not practiced the claimed invention (at any point in time) and because I am not aware of any other successful commercial deployments in the United States that are proven to embody the asserted claims.

413. Even if evidence of commercial success existed, it would not undermine the strong showing of invalidity. Moreover, the difference between the

challenged claims and the prior art is minimal, and any secondary considerations would have minimal impact on the invalidity analysis.

414. In my opinion, there was no long-felt, unresolved need met by the '925 Patent. For example, the systems disclosed by the references comprising the grounds and by the references I cite to corroborate the state of the art show that the claimed systems and method were already well understood, that many within the market observed their desirability and were at least concurrently working towards implementing them, and that some were even in use.

415. In sum, I am not aware of any of the factors for secondary considerations being present, but even if they existed, it would not impact the invalidity analysis.

VI. Conclusion

416. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

* * *

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on the information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Respectfully submitted,

Date: October 31, 2025



Kevin C. Almeroth, Ph.D.