

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

METARAIL, INC.,
Patent Owner.

Case No. IPR2024-01270
Patent No. 9,633,378

**PETITION FOR INTER PARTES REVIEW
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.1 et seq**

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APPENDIX LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 9,633,378 (“the ’378 patent”)
1002	Prosecution History of U.S. Patent No. 9,633,378
1003	Declaration of Dr. Edward A. Fox (“Fox”)
1004	Curriculum Vitae of Dr. Edward A. Fox
1005	U.S. Pat. App. Pub. No. 2005/0033641 to Jha et al. (“Jha”)
1006	U.S. Pat. App. Pub. No. 2006/0230033 to Halevy et al. (“Halevy”)
1007	Hila Becker et al., <i>What Happens after an Ad Click? Quantifying the Impact of Landing Pages in Web Advertising</i> , Conference on Information and Knowledge Management 2009 (Nov. 2, 2009) (“Becker”).
1008	U.S. Pat. App. Pub. No. 2005/0144048 to Belanger et al. (“Belanger”)
1009	Reserved
1010	Docket Sheet, <i>Metarail, Inc. v. Google LLC</i> , No. 1:23-cv-01116 (D. Del.)
1011	United States District Courts — National Judicial Caseload Profile, <i>available at</i> https://www.uscourts.gov/sites/default/files/fcms_na_appprofile0630.2024.pdf
1012	First Amended Complaint, <i>Metarail, Inc. v. Google LLC</i> , No. 1:23-cv-01116 (D. Del. Jan. 12, 2024), ECF No. 15
1013	Michael Uschold, <i>Ontology and database schema: What’s the difference?</i> , <i>Applied Ontology</i> , vol. 10, no. 3-4, pp. 243-258 (2015) (“Uschold”)
1014	U.S. Pat. App. Pub. No. 2005/0119921 to Fitzgerald et al. (“Fitzgerald”)
1015	Trip Advisor Press Release, “New Advertising Technology Delivers Results for Travel Marketers” (published Dec. 3, 2001) (“TripAdvisor”)

1016	U.S. Patent Pub. No. 2007/0239494 to Stephens et al. (“Stephens”)
1017	Reserved
1018	Doug Tidwell, et al., Programming Web Services with SOAP (1st ed. 2001) (“Tidwell”)
1019	U.S. Pat. No. 7,756,887 to Haveliwala (“Haveliwala”)
1020	Reserved
1021	Exhibit C of First Amended Complaint, <i>Metarail, Inc. v. Google LLC</i> , No. 1:23-cv-01116 (D. Del. Jan. 12, 2024), ECF No. 15
1022	Exhibit G of First Amended Complaint, <i>Metarail, Inc. v. Google LLC</i> , No. 1:23-cv-01116 (D. Del. Jan. 12, 2024), ECF No. 15
1023	Exhibit I of First Amended Complaint, <i>Metarail, Inc. v. Google LLC</i> , No. 1:23-cv-01116 (D. Del. Jan. 12, 2024), ECF No. 15

MANDATORY NOTICES

A. Real Party-In-Interest

Petitioner is the Real Party-in-Interest.¹

B. Related Matters

A decision in this proceeding could affect or be affected by the following:

1. United States Patent & Trademark Office

The following U.S. patent applications claim the benefit of priority to U.S. Patent No. 9,633,378 (“the ’378 patent”):

U.S. Patent Application No. 16/933,053, filed July 20, 2020.

The following *Inter Partes* Review proceedings involve patents in the same family as the ’378 patent:

IPR2024-01269 challenging U.S. Patent No. 10,789,626;

IPR2024-01271 challenging U.S. Patent No. 10,262,342; and

IPR2024-01272 challenging U.S. Patent No. 10,152,734.

2. U.S. District Court for the District of Delaware

A decision in this proceeding could affect or be affected by the following:

Metarail, Inc. v. Google LLC, Case No. 1:23-cv-01116 (DDE).

¹ Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

C. Counsel and Service Information - §42.8(b)(3) and (4)

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A power of attorney is submitted with the Petition. Counsel for Petitioner consents to service of all documents via electronic mail.

I. INTRODUCTION

Google LLC (“Petitioner”) requests *inter partes* review and cancellation of claims 1-26 (the “challenged claims”) of U.S. Patent No. 9,633,378 (“the ’378 patent”) (Ex-1001).

The ’378 patent describes a system for “automatically generat[ing]” deep-linked ads. Ex-1001, Abstract. The ’378 patent acknowledges that “deep-linked” or “parameter-based” digital advertising was known. *Id.*, 2:43-57. In such prior art systems, parameters provided by a user to one site (e.g., travel location and dates) are “passed along with each ad click to the appropriate advertiser.” *Id.*, 2:49-51. These passed-along parameters are used to “automatically activate searches” from an advertiser’s homepage, “thereby landing the web user ‘deep’” into a website rather than the homepage. *Id.*, 2:51-57; Fox, ¶35.

The ’378 patent alleges a problem with prior “deep-linked” or “parameter-based” systems in that the mapping between the fields in a publisher’s site and the corresponding fields in an advertiser’s site had to be “manually created by developing programmatic integrations between” the fields (e.g., “by manual code”). Ex-1001, 3:1-15. The ’378 patent simply purports to automate these mappings. *Id.*, 1:31-35, 3:26-27, 3:38-45, 4:8-10; Fox, ¶36.

As shown in Fig. 11A (below), the ’378 patent claims a “universal variable map” 613 created by crawling Internet websites to identify website form data. Ex-

1001, 8:43-56. Once a form is identified, the crawler “collects the names of variables and identifiers” on the form and stores them in a “universal variable map.” *Id.*, 9:41-45, 9:60-61. The universal variable map also includes “normalized variables” that “link” the names of the variables and identifiers obtained from the forms to provide the automated creation of **deep-links** (e.g., from a **Search Site 2** to a **Search Site 1**). *Id.*, 5:11-15. In this way, the universal variable “mapper” automates the previously manual variable link process.

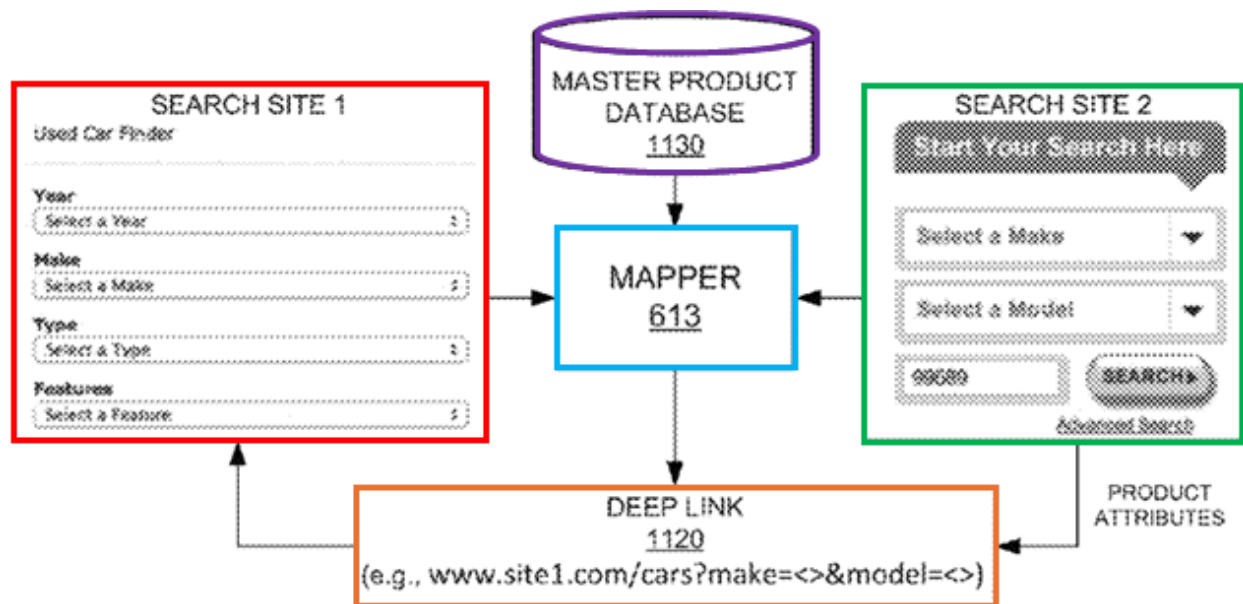


FIG. 11A

The '378 patent issued after extensive prosecution where the Applicants overcame the prior art by arguing that none of the references disclosed a universal variable map nor generating deep-linked ads using the universal variable map. *See* Ex-1002, 50, 188-90. Yet, as the patent concedes, serving parameter-based deep-

links on one site that repurpose parameters to a target site was well-known. While the '378 patent purportedly invented automated creation of such deep-links via its universal variable map, this too was known.

As explained herein, **Belanger** (Ex-1008), like the prior art described in the '378 patent, discloses serving deep-links such that parameter data included in the deep-link at the first site prepopulates parameters at a second site. Belanger's exemplary system uses these deep-links in support of a car rental system; nevertheless, a broader applicability is also taught and was known in the art relative to the overall travel industry.

Automating form gathering through web spidering/crawling and mapping form fields to create deep-links was also well-known as disclosed by **Halevy** (Ex-1006). Thus, at the time of the '378 patent, automating the manual process of mapping fields to create deep-links across websites was obvious, to avoid tedious manual coding of such link associations. Ex-1001, 3:6-15. Indeed, automating a manual process is *de facto* obvious. MPEP §2144.04(III). Moreover, automating this formerly-manual field linking offers greater scalability for deep-link creation to account for expanding business partners of a subject site, and was an emerging value-add to travel industry booking sites. That is, travel data such as date range and location is ideally leveraged across travel (e.g., car rental, hotel, and airline) reservation sites. *Infra* §§VI.A, VI.C.

II. REQUIREMENTS FOR IPR

A. Grounds for Standing (37 C.F.R. §42.104(a))

Petitioner certifies that the '378 patent is available for IPR and Petitioner is not barred or estopped from requesting IPR as to the challenged claims.

B. Specific Art on Which the Challenge is Based

Petitioner relies on the following prior art:²

Name	Ex.	Filing Date	Issue/Pub. Date	pre-AIA §
Halevy	1006	2006-04-05	2006-10-12	102(b)
Belanger	1008	2005-01-20	2005-06-30	102(b)
Haveliwala	1019	2005-02-16	2010-07-13	102(a), (e)

C. Identification of the Challenge (37 C.F.R. §42.104(b))

Petitioner requests IPR and cancellation of the challenged claims per the following grounds:

Ground Number and Reference(s)		Claims	Basis
1	Belanger in view of Halevy	1-6, 9-12, 13-16, 19-22, 23-24, 26	Pre-AIA §103(a)
2	Belanger & APA in view of Halevy	1-6, 9-12, 13-16, 19-22, 23-24, 26	Pre-AIA §103(a)
3	Belanger & Halevy in view of Haveliwala	7-8, 17-18, 25	Pre-AIA §103(a)

² Petitioner does not challenge the priority chain of the '378 patent as the art predates but reserves the right to do so in other proceedings.

4	Belanger, APA, & Halevy in view of Haveliwala	7-8, 17-18, 25	Pre-AIA §103(a)
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III. BACKGROUND

A. The '378 patent

The '378 patent describes automatically generating deep-linked ads using a so-called “universal variable map.” Ex-1001, Abstract. As discussed above, the universal variable map is a collection of “names” of variables and identifiers of web form fields found by crawling Internet websites and applications. *Id.*, 8:43-56; 9:41-54. These “names” are stored in the universal variable map and associated with “normalized variables.” *Id.*, 5:11-15, 9:60-65. These normalized variables serve as links between the fields of a first site and corresponding fields of a second site that were previously correlated manually to create parameter-value-passing deep-links. *Id.*, 5:11-15; Fox, ¶34.

Figure 11A (below) illustrates the process for generating deep-linked ads using the universal variable map for a user visiting a car search website (e.g., [Search Site 2](#)). Here, the [universal variable mapper 613](#) “provide[s] to its visitors a deep-linked ad for [Search Site 1](#),” which is a search site for a “Used Car” in the same “vertical,” (i.e., website category):

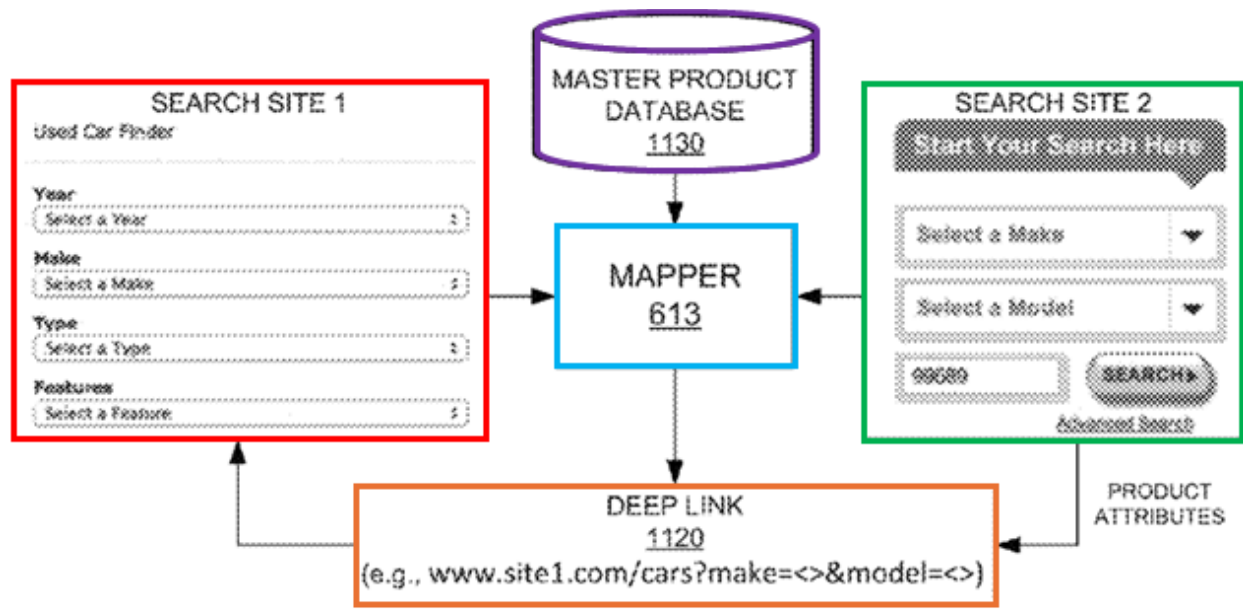


FIG. 11A

Ex-1001, 13:61-62; Fox, ¶37. To generate the deep-linked ad, **mapper 613** accesses the universal variable map of **Master Product Database 1130**, “cross reference[s] programming variables³ entered into **Search Site 2** with those used by **Search Site 1**, and automatically create[s] a deep-linked ad” (e.g., **deep-link 1120**). Ex-1001, 13:59-14:7. The **deep-linked ad** is placed on **Search Site 2** so a user selecting the ad, “is automatically directed to a network address indicated by” the **deep-link 1120**, *i.e.*, **Search Site 1**, which provides content corresponding to the parameter

³ The '378 patent uses the terms “programming variable,” “variable,” “field identifier,” and “identifier” interchangeably. *See* Ex-1001, 4:21-22, 9:20-27, 9:41-45, 13:25-31.

data entered on **Search Site 2**; for example, in directing the user's browser to the deep-link location, the form at **Search Site 1** is "pre-populated with ... any user input provided at **Search Site 2**," like user entries of "Toyota" and "Prius" in the field selectors. *See id.*, 14:4-9; Fox, ¶37.

The purported improvement that this process provides over the prior art is automating the manual process of "mapping" programming variables on one website to corresponding programming variables on another website via the universal variable map's collection of website data organized by content (i.e., "verticals"). Ex-1001, 3:16-17, 8:26-39, Figs. 4, 5. As described in Figure 11A, this data is used to automatically generate deep-links that map user-entered values in a first website's form fields to corresponding variables or field identifiers of a second website's form fields. *Id.*, 13:59-14:7; Fox, ¶38.

B. Prosecution History

The '378 patent issued after several rejections under §101 and §103. Ex-1002, 145, 201, 283, 323. Nevertheless, the Notice of Allowance states that none of the cited references disclose the claimed *universal variable map*. *See* Ex-1002, 50; Fox, ¶39; *infra* §X.II (claim listing appendix). None of the prior art applied herein was cited or applied during prosecution.

IV. LEVEL OF ORDINARY SKILL IN THE ART

The '378 patent relates to web-based e-commerce. A person of ordinary skill in the art ("POSA") would have had a bachelor's degree in computer science or a related field, and at least two years of experience with web programming and search engine systems. Fox, ¶32. More education could substitute for experience, and vice versa. This person would have been capable of understanding and applying the teachings of the '378 patent and the prior-art references discussed herein. *Id.*

V. CLAIM INTERPRETATION

Claim terms subject to IPR are to be construed in accordance with their ordinary and customary meaning as understood by a POSA in light of the specification and prosecution history. 37 C.F.R. §42.100(b). Only terms necessary to resolve the controversy need to be construed. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). Petitioner reserves the right to argue different constructions in any other actions involving the '378 patent.

VI. GROUND 1: CLAIMS 1-6, 9-16, 19-24, AND 26 ARE OBVIOUS OVER BELANGER IN VIEW OF HALEVY

A. Belanger – Parameter-Based Deep-Linking

Belanger (Ex-1008) discloses "a reservation booking website" that uses "promotional deep-links" to assist users in booking car reservations. *Id.*, [0019],

[0128], [0168-69], Fig. 37 (showing promotional deep-links 318). The website's booking page includes various fields for the user to enter data related to the reservation, such as pickup and return dates, pickup location, and vehicle type. *Id.*, [0165], Fig. 37.

Fig. 37

4:4-7, 14:3-9 (deep-links can take the user to a page with a “form” that is “pre-populated with field identifier values”). These promotional deep-links are used in various ways, including advertised on other websites. *Id.*, [0168]. These deep-links beneficially “provide single click deep-link access to the reservation booking website.” *Id.*, [0178]; *see also* Fitzgerald (Ex-1014) (parent of Belanger, incorporated by reference”); Fox, ¶¶46-47.

Belanger’s Figure 53 shows an example of “promotional link 318” on a confirmation web page presented at completion of the booking process. This link offers a discount at an amusement park attraction. *Id.*, [0128], Fig. 53; Fox, ¶48.

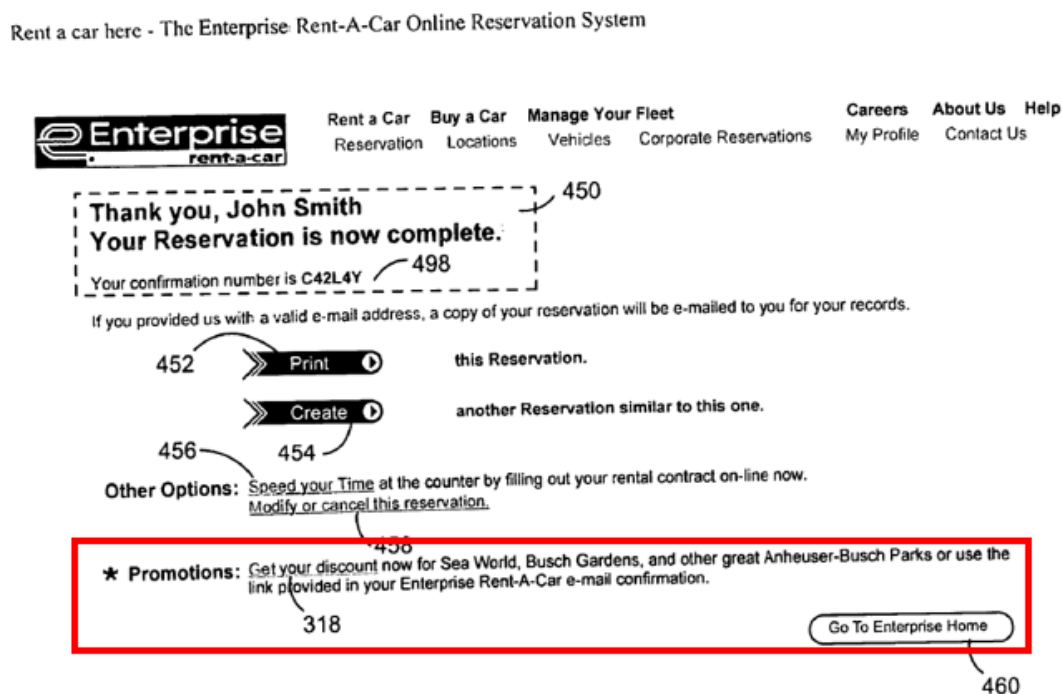


Fig. 53

POSAs would have understood links 318 of Fig. 53 to be deep-links given the common descriptor “promotional links 318” used by Belanger to describe these links. Belanger, [0128] (describing links 318 that appear on various webpages and are “selectable to initiate a reservation transaction according to the conditions of the promotion”), Fig. 37; Fox, ¶49. Additionally, given the value of deep-linking to yield “a large degree of user-friendliness in that the user is alleviated of the need to remember,” POSAs would have nevertheless been motivated to provide this same accustomed benefit of deep-linking to customers for any outgoing links to booking sites having forms with similar date and location fields. *See, e.g.*, Belanger, [0179], [00168-69], [0020]; Fox, ¶49. Using outgoing deep-links that repurpose user-entered data (e.g., date and location of a car rental), a user could be likewise advanced to a particular “stage” in the booking process of an amusement park, airline, hotel, etc. website. Fox, ¶49. For example, POSAs would have recognized that when a customer is renting a car in a specific geographic location, and on specific dates, a geographically local promotion with date/time conditions within the user’s rental period would have provided effective cross-promotion by repurposing user-entered trip parameters to prepopulate the corresponding parameter with the same values (e.g., repurposing car rental pick-up date/time and location in airline reservation travel dates and destination, hotel reservation check-in dates and location, local attraction tickets, etc.). Fox, ¶50.

Indeed the '378 patent admits that:

A recent advancement in Digital Advertising has been “deep-linked” or “parameter-based” advertising. This form of advertising *today* applies to search and E-commerce sites where the user is searching for a product or service, ***like a travel site, and types in search parameters, such as where s/he is traveling from, where to, travel dates, how many people in the party, class of travel, etc.*** These search parameters are ***then passed*** along with each ad click to the appropriate advertiser.

Ex-1001, 2:43-51 (emphasis added); *see also* TripAdvisor (Ex-1015), 1 (describing deep-links for travel sites that repurpose user-entered reservation data); Becker (Ex-1007), 2, 4 (describing landing pages that re-execute the user’s query (“sometimes with slight modification”) at an advertiser’s site); Fox, ¶51.

Moreover, POSAs knew that reuse of travel parameters was particularly effective for increasing traffic conversion (sales), customer engagement, and customer experience. Fox, ¶52; TripAdvisor, 1 (announcing that “contextual-linking technology” providing travel location specific “deep-link[s]” “correlate[d] to search terms ... used by travelers” led to a “32X improvement” in response rate over “most online advertisements”). Additionally, as the '378 patent admits, POSAs were aware that to make deep-linked promotions work, the parameters entered by the user from the first site needed to be input into the appropriate variables on the second site. Ex-1001, 2:64-67. Accordingly, POSAs would have found it obvious to employ such deep-links in the “promotions” section of, *e.g.*,

Belanger's Figure 53, to ensure that car rental customers would enjoy a similarly streamlined booking experience across other travel websites (e.g., hotels, airlines, amusement parks, etc.) as added value in booking their car rental with a particular company (e.g., Enterprise Rent-a-Car). Belanger, [0168], [0179], [0206]; TripAdvisor, 1; Fox, ¶53.

In addition to providing value for customers, POSAs would have recognized that travel booking websites benefit from increased traffic of committed travelers who have booked a car rental for linking to their hotel, airline, or attraction site. TripAdvisor, 1; Fox, ¶54. Likewise, Belanger's reservation website would also benefit from similar traffic and seek to facilitate business relationships with other travel sites for preferential ranking or placement of its own deep-linked promotions on such booking webpages. TripAdvisor, 1; Fox, ¶54. Indeed, Belanger teaches advertising its own deep-links on "other websites" (Belanger, [0168]) and POSAs would have recognized that the reciprocal exchange of traveler booking information benefits all travel partner sites. TripAdvisor, 1, Ex-1001, 2:53-3:6; Fox, ¶54.

Regarding placement of promotional links 318, while Belanger's Figure 53 shows a single link 318 after the bolded label "Promotions," POSAs understood that the "Promotions" label may also refer to multiple promotional deep-links or a link to a page with multiple promotion deep-links (e.g., as in Fig. 37, left column),

and that this confirmation page would beneficially display multiple promotion links in a desired order or placement. Fox, ¶55; Belanger, Fig. 37 (showing promotions 318 including a link to “All Promotions”). POSAs thus would have been motivated to also implement the confirmation page in Figure 53 to include multiple promotion deep-links to different categories of travel services to provide more cross-promotional opportunities once booking is confirmed. Fox, ¶55; TripAdvisor, 1.

1. Creation and Serving of Deep-Links

To serve promotional deep-links, Belanger describes an exemplary “[a]utomated reservation transaction processor 150” including one or more “application servers” that interact with the “customer/promotional database.” Belanger, [0106], Fig. 6; Fox, ¶56. These application servers are hosted on “web servers” to which customers’ browsers connect to access the reservation website. Belanger, [0106]; Fox, ¶56.

The application servers run a “servlet” that “performs ... the reservation booking process,” including generating webpages by “interact[ing] with the databases to gather necessary information” to “determin[e] which page should be constructed” and “the particular data that should appear on the page.” Belanger, [0107-09]; Fox, ¶57. POSAs understood that with the promotional deep-links being part of the “data that should appear on the page,” the servlet generates the

advertised promotions and their deep-links using the promotional settings in the promotional database. Belanger, [0019], [0107-08], [0168]; Fox, ¶57.

The provided promotional conditions (i.e., parameter values) in the promotional deep-links on Belanger’s website are associated with the field parameter names included in the deep-link manually (i.e., via human interaction). This manual process is facilitated through a user interface (*see, e.g.*, GUI 700 in Fig. 73) where an “administrator” (e.g., an employee of the reservation site or business partner) controls “a plurality of settings for the ... rules of a promotion.” *Id.*, [0081], [0209], [0212]. The promotion settings are stored in a “customer/promotional” database (*e.g.*, Fig. 2’s database 208) “for subsequent retrieval and processing” (*id.*, [0209]) and used to control the display of promotional deep-links shown on the reservation webpage (e.g., via Fig. 37’s marketing tile 317 where promotions 318 are displayed). *Id.*, [0128], [0209-10]. Belanger also describes data exchanges with other servers (e.g., business partners) for promotional linking operations implemented as web services, such as through well-known “Simple Object Access Protocol (SOAP)” and XML formatted messaging. *Id.*, [0024], [0110-13]; Fox, ¶58; Tidwell (Ex-1018), 10-12, 19 (describing web services using SOAP).

POSAs understood that despite leveraging emerging web services for exchanging data via SOAP/XML, manually creating promotion settings for deep-

links is time- and resource-intensive and multiplies along with the scale of desired promotions, and not only impacts Belanger's offered promotions, but also Belanger's ability to implement outgoing links to travel partners. Fox, ¶59; *see* Ex-1001, 3:26-28. That is, this bottleneck would have hampered Belanger's website operators' abilities to expand outgoing promotions to follow the industry trend (noted *supra* §VI.A) towards reusing user-entered data across partner websites in the travel industry. Fox, ¶59; TripAdvisor, 1. Accordingly, POSAs would have looked to solutions for automating the programmatic association of corresponding web form parameters between websites to generate more and better deep-linked promotions that repurpose user-entered data, as discussed *infra* §VI.C. Fox, ¶59.

B. Halevy⁴

Halevy teaches one such system for automatically generating deep-links, by querying a "form database." Halevy, [0009]. Halevy's form database, like the '378 patent's universal variable "mapper," automatically maps fields on forms from different websites to a shared set of identifiers (i.e., "properties") determined from the form data, thereby mapping corresponding fields across various website forms to each other. *Id.*, [0037], Fig. 2; Fox, ¶61.

⁴ Halevy issued as U.S. Patent No. 8,037,068 and is currently assigned to Petitioner, Google LLC.

1. Halevy Automatically Maps Data Fields of Website Forms for Creating Deep-links

To create the form database, Halevy teaches a web crawling process (*see* Fig. 1 below) executed by a form engine 106 that “accesses a number of forms 121-123 which are hosted on servers located throughout network 110.” Halevy, [0035]. These forms, “obtained” from “a number of sources,” provide “access to data within underlying databases 131-133.” *Id.*, [0035], [0037], Fig. 1.

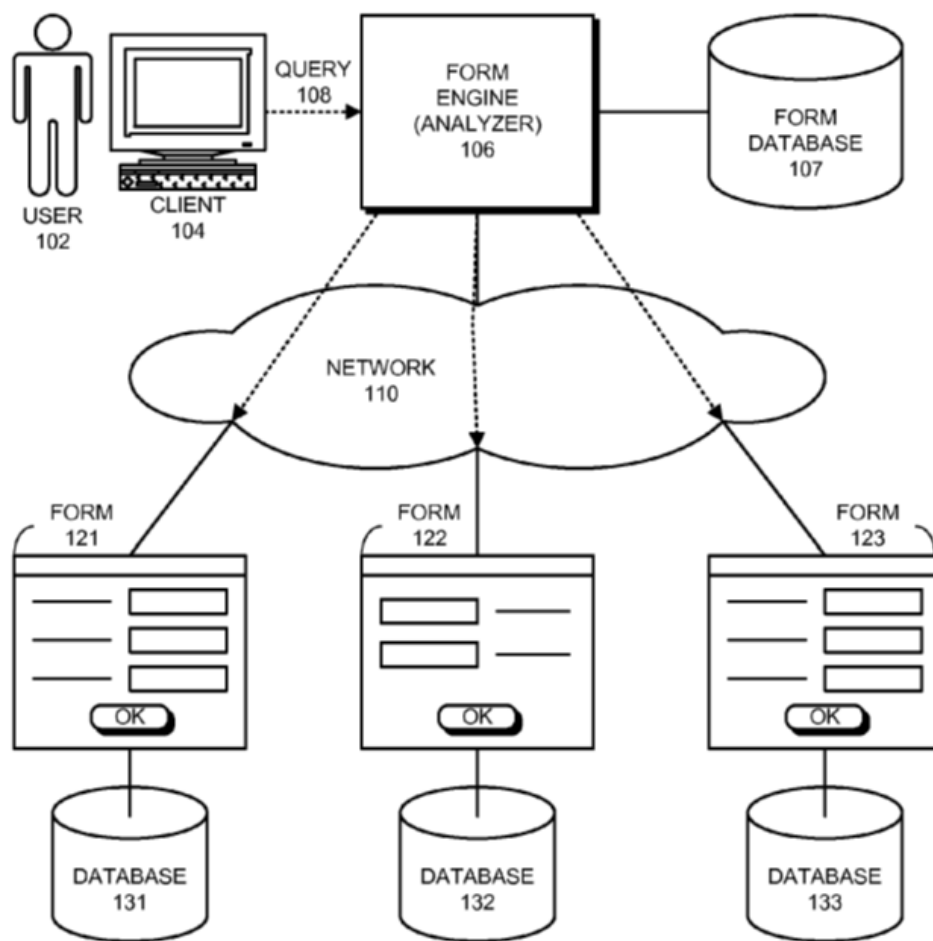


FIG. 1

Once forms are identified, as discussed further *infra* §VI.D, Halevy’s crawling process “creates database entries for the identified forms” by “obtaining and storing metadata describing the identified forms into database entries” in form database 107. *Id.*, [0009], [0015]. This “metadata” includes data describing the “input fields” on the form, such as the field’s “parameter name” or field identifier. *Id.*, [0016], [0037], [0044], Fig. 2; Fox, ¶63.

2. Universal Variable Map (Form Database)

For each form entered in the form database, Halevy’s process computes a “class” for the website the form is found on (e.g., a “university” or “newspaper” website) and a “class” for the form itself. The form’s “class” indicates “the types of objects that can be obtained by querying the form,” *e.g.*, “books, hotels, restaurants” and “houses, jobs, and cars for sale.” Halevy, [0039-45], [0057]; Fox, ¶64. Halevy refers to the “classes” as “SO-classes,” or “search ontology” classes. Halevy, [0038], Fig. 6; Fox, ¶64. The classes in turn have “SO-properties” or “search ontology” properties; these properties, also called “output properties,” represent “the type of information... obtain[ed]” using the form. Halevy, [0038], [0048]; Fox, ¶64.

For example, if a form’s “SO-class” is “car,” then the form’s fields are mapped to the “SO-properties” for the “car” class, *e.g.*, “make” and “model.” Halevy, [0095], [0098-101]; Fox, ¶65. Likewise, POSAs understood that if the

form’s “SO-class” is “hotel,” then the form’s fields may be mapped to the “SO-properties” for the “hotel” class, *e.g.*, “arrival date,” “departure date,” and “location.” Fox, ¶65. POSAs also understood that other classes of forms such as “amusement park,” “car rental,” “airline,” etc., or more generally, “reservations” would similarly map relevant fields to that class’s SO-properties. *Id.* Halevy also computes a “schema mapping,” which is a “mapping between the fields in the form and the SO-properties.” Halevy, [0049], [0062-67]; Fox, ¶65.

For each form, Halevy’s form database stores the form’s identified class, data for each field (including the parameter name), and the mapping between the form’s fields and the corresponding properties of the form’s class. Halevy, [0044-49] (“For each form in the source [i.e., website] the following information can be captured... [f]ields in the form... includ[ing] its parameter name... [t]he class of the form... [s]chema mapping”), [0067], [0125], Fig. 3 (annotated below); Fox, ¶66.

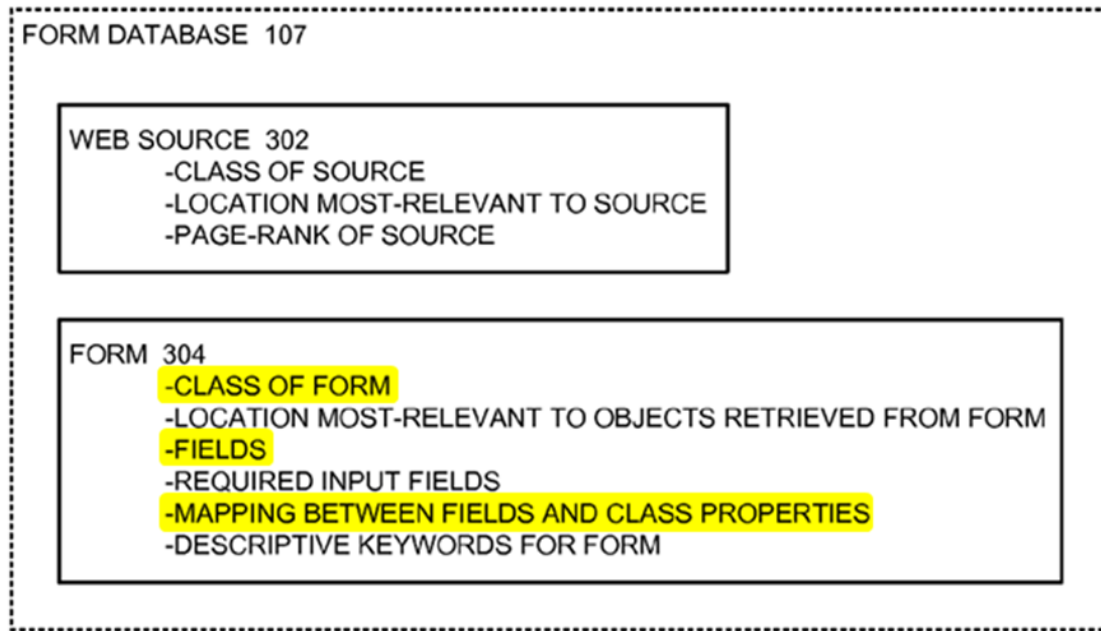


FIG. 3

The class and properties identified for the various forms are then used to “facilitate subsequent searches through content which is accessible through” the forms. Halevy, [0009], [0136-38], Fig. 2. This search process, explained in detail directly below, accepts a query string and, via the form database’s hierarchy of classes and their properties, returns a list of deep-links to various identified forms in the database with the keywords of the query assigned to fields in the deep-link based on mapping the keywords and the form’s fields to the same SO-properties. *Id.*, [0018], [0136-38], [0125] (describing mapping query keywords to form fields using the SO-properties); Fox, ¶67. This use of the form database shows that Halevy maps corresponding form fields from different websites to the same SO-property to provide search capabilities on multiple forms that return similar data,

despite the fields on each form having different parameter names. Fox, ¶68; Halevy, [0062-66] (describing mapping fields to SO-properties), [0125] (describing identifying forms by mapping query keywords to fields based on mapping the keywords to the same SO-properties).

3. Retrieving Deep-Links from the Form Database

Halevy teaches querying its form database to return a list of relevant “query-through links.” Halevy, [0136-38]; Fox, ¶69. Each of the query-through links automatically directs the user to either a results webpage or a partially filled form at the website identified in the link (Halevy, [0138], [0143]), with the keywords in the query associated with corresponding parameter names of the form’s fields. *Id.*, [0123-28] (describing generating deep-links with query keywords associated with corresponding field parameters based on the SO-properties determined for the keywords and fields); Fox, ¶69.

This query process is diagrammed in Halevy’s Fig. 6 (below) where the system “receives a query containing keywords (step 602)” and “predicts a search-ontology class for the query based on the keywords (step 604).” Halevy, [0136]. The system then “constructs a structured query” by “mapping keywords to [SO-] properties” of the predicted class (step 606). *Id.* For example, Halevy describes converting an example user query “Telephone David Ko 98102” to a structured query in the “Person” SO-class, with the “FirstName” SO-property assigned the

value “David,” the “LastName” SO-property assigned the value “Ko,” and the “ZipCode” SO-property assigned the value “98102.” *Id.*, [0112]; Fox, ¶70. Using this structured query, Halevy’s system “performs a lookup” in the form database “to identify forms of interest (step 608),” which are “rank[ed]” and then “present[ed to] the user” as “query-through links” (step 612). Halevy, [0114], [0137-38]; Fox, ¶71. Each query-through link, when clicked by the user, “submit[s] a query to the associated form of interest (step 614)” by prepopulating the form’s fields with their associated keywords, as determined by the SO-property mapping. Halevy, [0136-38], [0127]; Fox, ¶71.

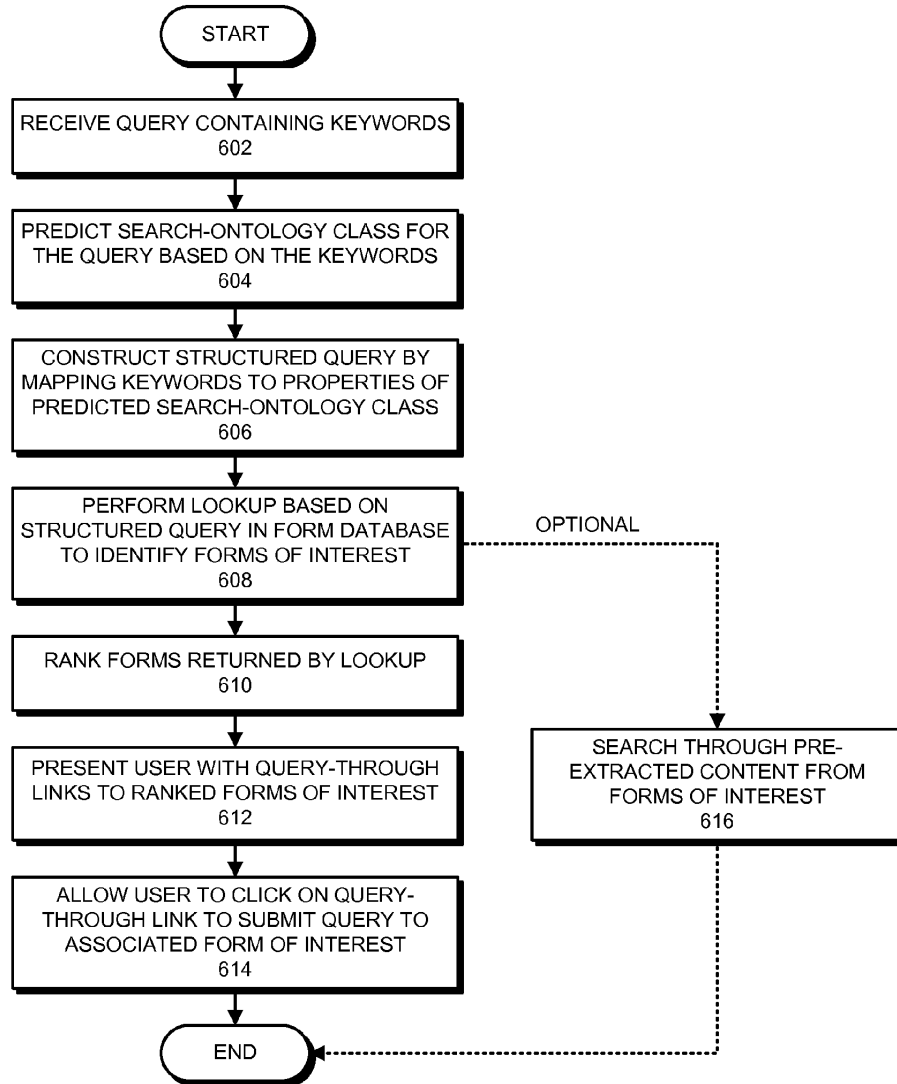


FIG. 6

Because Halevy’s query-through links (each to a “form of interest”) include an association of query keywords to corresponding field parameter names to automatically generate search results from the linked form using the keywords as values in the form’s fields, POSAs would have recognized the query-through links to be deep-links that repurpose the query keyword values. Halevy, [0123-28], [0136-38], [0143]; Fox, ¶72. Furthermore, because Halevy discloses that a single

structured query (with keywords of the query mapped to SO-properties) returns *multiple* query-through links (with keywords mapped to corresponding fields based on the SO-property mapping), POSAs would have understood Halevy's system to map corresponding form fields from different websites to the same SO-properties (i.e., obviously, because otherwise returning multiple deep-link results from a single query would be impossible). Fox, ¶72.

Since Halevy describes its search functionality as an enhancement to conventional network-based search engines (Halevy, [0007-08]) and the system uses “any type” of “communication channel” able to connect “computing nodes” (*id.*, [0034]), POSAs would have found it obvious for Halevy's system to use SOAP (which is used by Belanger) as a communication channel to receive queries and return resultant deep-links. Fox, ¶73; Belanger, [0110], Tidwell, 10-12, 19. Likewise, POSAs would have found it obvious for Halevy's system to use XML (also used by Belanger) for data representations (e.g., of queries and resultant deep-links) that are communicated using SOAP. Fox, ¶73; Belanger, [0024], [0110-0120]; Tidwell, 2, 6, 11, 12, 15-38.

C. POSA's Motivations to Modify Belanger in view of Halevy

As discussed *supra* §VI.A.1, Belanger teaches a reservation website implementation where an “application server” determines the content shown on the website, where this content includes promotional deep-links selected for display by

the servlet when generating a promotion for a webpage. Belanger, [0019], [0106-09], Fig. 53 (element 318); Fox, ¶77. Additionally, as discussed *supra* §VI.A, POSAs would have been motivated to implement Belanger's reservation website so that the promotional deep-links displayed during or at the close of booking (e.g., Fig. 53) advertise related travel websites known to use similar user-entered parameters, and that would benefit from repurposing these parameters. Fox, ¶77; TripAdvisor, 1.

Belanger's promotions rely on *manual* creation of deep-links (Belanger, [0207], [0209]), as noted *supra* §VI.A.1. Fox, ¶78. Rather than requiring a person (e.g., administrator or vendor employee) to manually enter promotional conditions for each vendor website deep-link promoted on Belanger's website (*see* Belanger, [0209-12]), POSAs would have been motivated to use solutions that generate deep-links with promotional conditions automatically, such as reusing parameters already entered by the user during the booking process to leverage at other travel websites. Fox; ¶78; TripAdvisor, 1. Halevy teaches one such system for automatically generating deep-links to other websites with the keywords from a query repurposed as parameter values in the deep-link. Fox, ¶78. POSAs would have been motivated to modify Belanger with Halevy's teachings as detailed below.

Halevy's system includes a "form engine" that "exist[s] on any computing device which is accessible through [a] network" using "any type of... communication channel capable of coupling together computing nodes." Halevy, [0034]; Fox, ¶79. Belanger discloses using the well-known "Simple Object Access Protocol (SOAP)" to exchange data between computers (Belanger, [0110]), which a POSA would have found obvious to utilize as a "communication channel" to Halevy's system. Halevy, [0007-08]; Fox, ¶79; Tidwell, 19 (describing submitting a query to a search engine using SOAP).

To automatically generate deep-links for promotions that repurpose user-entered travel data, as discussed above, POSAs would have been motivated to modify Belanger's application server to retrieve deep-links for desired promotions automatically. Fox, ¶80. POSAs would have found it obvious to use Halevy's system to automatically generate these deep-links because Halevy's system returns deep-links relevant to a query's keywords, with some of the keywords mapped to corresponding parameter names in the deep-link. Fox, ¶80. POSAs would have recognized that Belanger teaches such a web service data exchange for similar purposes (Belanger, [0110]), and leveraging this existing communication feature would have automated the sending of queries and retrieval of deep-links from Halevy's system for presentation as related travel promotions (as Belanger already

provided, *e.g.*, at the close of booking via Figure 53) by submitting queries to Halevy’s “form engine” using SOAP. Fox, ¶80.

As discussed *supra* §VI.B.3, Halevy teaches allowing end-users to query the form database to retrieve deep-links. Halevy’s system generates deep-links by determining keywords from the query to identify a “search class” for the query, “mapping the individual words in the query to properties of the chosen search class,” and performing a look-up in the database with the class and property mapping. Halevy, [0089-92], [0112], [0137-38]; Fox, ¶81. Halevy describes using various types of “prediction” to perform its identification and mapping process. Halevy, [0090-111]; Fox, ¶81.

In Belanger/Halevy, where Belanger’s application server generates deep-links for promotions by sending queries to Halevy’s form engine, POSAs understood that the queries would have been constructed to yield a desired deep-link. Fox, ¶82. For example, should Belanger’s application server display a promotion for hotels, or a specific hotel partner, POSAs would have found it obvious for the application server to construct a query for Halevy’s system specifying the keyword “hotel” or the name of the branding partner, along with the user-entered values for date and location, to generate a list of deep-links—to hotel websites or to the specified brand website—that display search results using the user-entered date and location as parameter values. Likewise, POSAs would have

found it obvious for the application server to construct a query using just the user-entered date and location values of the car rental reservation of Belanger for a list of deep-links to any type of website that also uses date and location values to generate a results page. Fox, ¶82. Such an implementation would have been within a POSA's skill, as it involved basic programming techniques to communicate values entered by the user in the fields on Belanger's reservation website along with any pre-defined keywords (e.g., such as "hotel"), and to construct a query string so that Halevy's system would return one or more deep-links relevant to the query string. Fox, ¶82.

POSAs would have recognized that implementing Belanger's and Halevy's teachings discussed above, where Belanger's application server sends a query string to Halevy's system to retrieve deep-links, was an obvious way to leverage Halevy's existing form database via Belanger's existing data exchange mechanism (i.e., SOAP) for using customer-entered parameters to automatically generate deep-links. Fox, ¶83; Tidwell, 10-12, 19 (describing submitting queries to a search engine using SOAP). For example, when generating Belanger's Figure 53 UI (or another webpage displaying promotions) in view of Halevy, POSAs would have used Belanger's existing SOAP/XML messaging to send Halevy's system query strings, using relevant data entered by the customer such as date and location along with any other optional keywords, and to search Halevy's form database for one or

more relevant deep-links for the promotions displayed on Belanger’s webpages. Fox, ¶83.

To retrieve deep-links for presentation, POSAs would have modified Belanger’s application server, which runs the “servlet” responsible for selecting promotions for display (*see supra* §VI.A.1), to query Halevy’s system (using SOAP) with the user-entered data and any other keywords during the booking process to repurpose the user-entered data in the deep-links. Such would enable a more robust and automatic presentation of promotional deep-links (e.g., Fig. 53) as was known to be desirable in the travel industry to yield better results. Fox, ¶84, TripAdvisor, 1.

For example, Belanger’s Figure 53 UI is a “confirmation” page. Belanger, [0063]. Thus, POSAs understood that at the point in the reservation process where Figure 53 is displayed, the user has already entered data relevant to the reservation on previous pages, *e.g.*, on Figure 37’s “home” page. Belanger, [0056], [0122], Fox, ¶85.

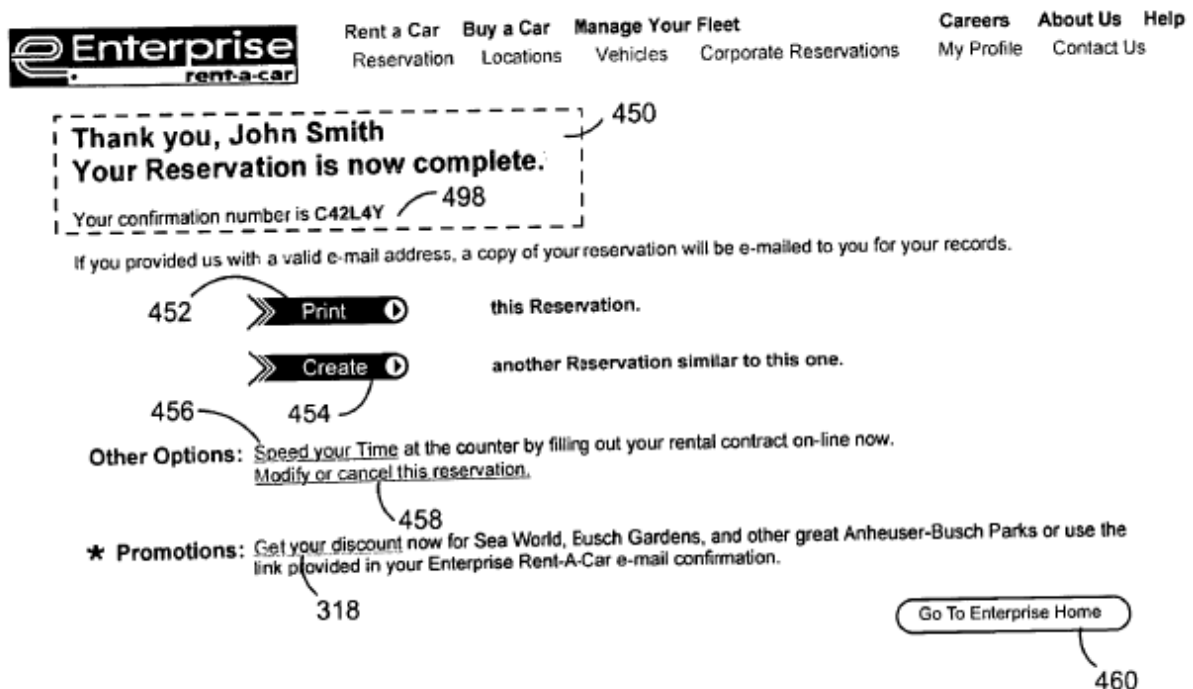


Fig. 53

Belanger's Figure 53 teaches displaying promotions (promotional link 318) upon reaching confirmation. As discussed *supra* §VI.A, POSAs would have been motivated to implement Figure 53 so that this promotional link is a deep-link to a website offering reservations for travel-related products/services like hotels, restaurants, attractions, or airlines, where the deep-link includes parameter values corresponding to values entered by the user during the reservation process. Fox, ¶86; TripAdvisor, 1. Further, as discussed in this section above, POSAs would have leveraged Halevy's teachings to automate the process of serving deep-links to avoid the well-recognized limitations and drawbacks of manual coding. POSAs

recognized that the presentation of promotions on, *e.g.*, Fig. 53 is an interface design consideration that may vary with the website's presentation style and desired promotion to be displayed, and that the query submitted to Halevy's system via SOAP/XML would be adjusted accordingly to return a desired deep-link. Fox, ¶86.

For example, Fig. 53 may include a list of different types of promotions, in which case the query for each promotion would be restricted to only return deep-links to specific products or services. *Id.*, ¶87. In this case, Belanger's application server would submit to Halevy's system a query string specific to each promotion, as discussed above, that returns one or more deep-links to forms in specific "class[es]" of interest (*e.g.*, airline booking, hotel booking, restaurant booking, etc.), where the date and location values submitted by the user on Belanger's reservation website are populated as the date and location values in each deep-link. Halevy, [0123-28], [0136-38]; Fox, ¶87. Furthermore, Halevy teaches "ranking" search results based on relevance of the pages that the links point to and "proximity to the location mentioned in the query and associated with the web source"; thus, POSAs would have been motivated to implement Belanger's webpage to only show a certain number of the top-ranked promotions using the deep-links, or would have selected a single deep-link to promote, to avoid visually cluttering the page. Halevy, [0145]; Fox, ¶88.

As another example, Fig. 53 could be implemented to show separate links to promotions for different categories, *e.g.*, airline booking, hotel booking, and restaurant booking. In this case, each link would take the user to lists of promotions in that category. Each list would be generated by submitting a relevant query string to Halevy's system and then ranking and limiting the resultant deep-links in the same manner discussed above, except that separate queries would be submitted for each category. Fox, ¶89.

D. Claim-by-Claim Analysis

In the discussion below, “Belanger/Halevy” refers to the combination of Belanger in view of Halevy described *supra* §VI.C, and “Belanger” or “Halevy” refer to their respective disclosures. Fox, ¶94.

1. Claim 1

- a. **[1PRE] “A method, comprising: at and by a server computer operating in a network environment and having at least one processor and non-transitory computer memory:”**

Belanger teaches a “*method* of processing a reservation transaction” by “a reservation booking website hosted by automated reservation transaction processor” that “can be any computer that is network connectable.” Belanger, [0014], [0106]. This transaction computer includes “an application server” interacting with various databases. *Id.*, [0106-07]. POSAs would have recognized Belanger's application server processing a reservation transaction to be “*a server*

computer operating in a network environment and having at least one processor and non-transitory memory.” Id.; Fox, ¶95.

As discussed *supra* §VI.C, an example of performing Belanger’s method—when Belanger’s website is implemented to query Halevy’s form database—includes displaying promotions on Belanger’s webpages with deep-links that reuse values entered by the user on Belanger’s website (e.g., via Fig. 37’s webpage). As detailed *infra* §§VI.D.1.b-VI.D.1.j, this method ***comprises*** the remaining limitations of claim 1. Fox, ¶96.

- b. [1A] “obtaining, utilizing a set of obtaining rules, a plurality of explicit or implicit computer-readable field identifiers from a plurality of sites or applications on the Internet;”**

Belanger/Halevy, as discussed *supra* §VI.C, discloses this limitation via Halevy’s form crawling process (*see supra* §VI.B.1) that “crawl[s] through web sites to identify web-based forms.” Halevy, [0035]. As Halevy’s Figure 1 (below) shows, this process “*obtain[s]*” form data from “*a plurality of sites or applications on the Internet*” because it “accesses a number of forms 121-123 which are hosted on servers located throughout network 110 ... to access to data within underlying databases 131-133.” *Id.*, Fig. 1. During this process, Halevy’s form engine 106 “obtains web-based forms of interest,” and “creates corresponding database entries for the identified forms” in the “form database 107.” *Id.*, [0035], [0037], Fig. 1.

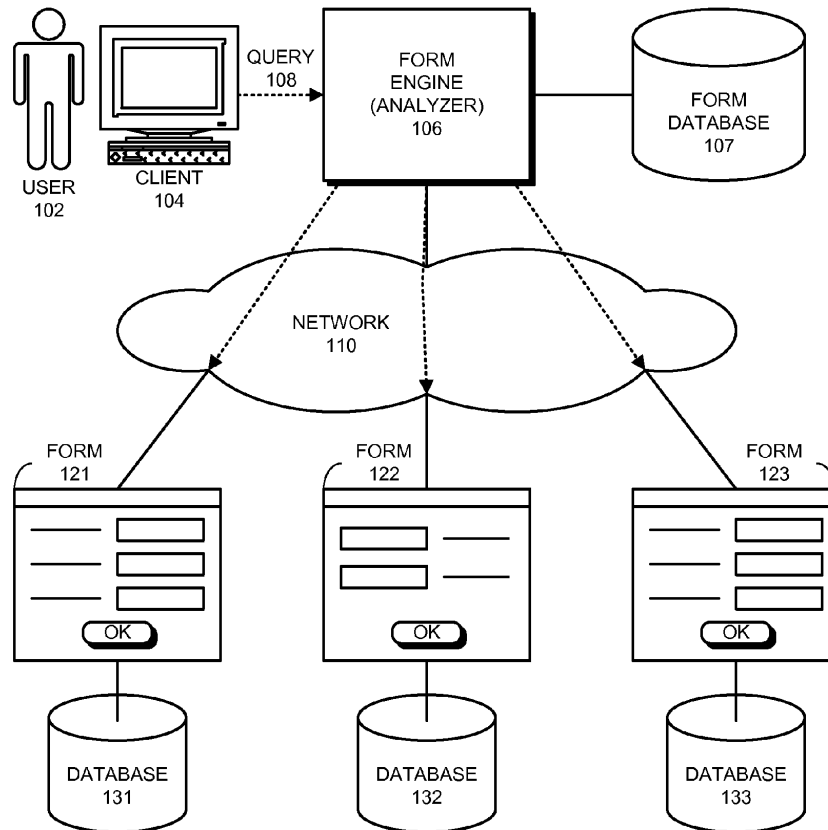


FIG. 1

Halevy’s crawling process includes “*obtaining ... a plurality of explicit or implicit computer-readable field identifiers*” because for each form, the process captures “each field” including “its *parameter name (used to invoke some server side-script)*.” Halevy, [0043-44]; Fox, ¶97.

Halevy discloses forms written in “HTML,” which POSAs would have understood was a standard language for webpages. Halevy, [0142]; Fox, ¶98; Belanger, [0012]; Jha (Ex-1005), [0063], [0098]. POSAs would have understood that in HTML, the “parameter names” for fields are what the ’378 patent describes

as the “names of programming variables and identifiers” (Ex-1001, 13:25-29). Fox, ¶98. Thus, a “parameter name” is a “*computer-readable field identifier*.” Fox, ¶98.

Halevy’s crawling process uses “*a set of obtaining rules*” to obtain each form and its field data (e.g., parameter names or *computer-readable field identifier*); these rules include “pursu[ing] hyperlinks recursively starting from a seed page (e.g., the main page of the web site),” “determin[ing] whether the web forms on the page ... are interesting and worth recording,” and “reconcile[ing] duplicate web forms.” Halevy, [0081-85]; Fox, ¶99.

c. [1B] “applying via programming code a set of enhancing rules to enhance results of the obtaining of the plurality of computer-readable field identifiers;”

Belanger/Halevy, as discussed *supra* §VI.C, discloses this limitation via Halevy’s crawling process (*see supra* §§VI.B.1–VI.B.2 and VI.D.1.b) that analyzes each form and its fields to create a searchable hierarchy of SO-classes and SO-properties in the form database. Halevy, [0036], [0037-38]; Fox, ¶100.

POSAs would have understood Halevy’s crawling process to use “*a set of enhancing rules to enhance the results of the obtaining*” of form fields (i.e., *computer-readable field identifiers*) because for each form, the process determines “[t]he class of the form” (i.e., “the types of objects that can be obtained by querying the form” such as “books, hotels, restaurants” also referred to as SO-class), the geographic locations relevant to the form, any “required fields,”

“[o]utput properties” for the fields (e.g., SO-properties), and any “additional keywords that describe the form.” Halevy, [0045-49]; Fox, ¶101. This information for each form and field, enhanced with SO-classes, is stored in the form database as shown in Figure 3, annotated below:

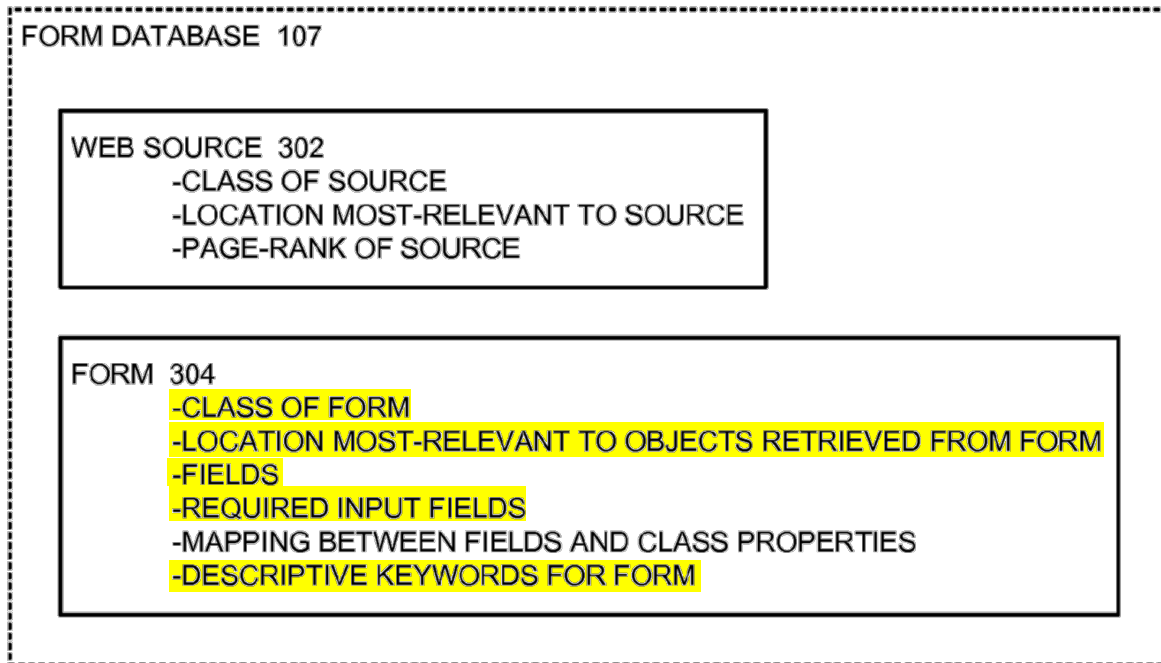


FIG. 3

POSAs would have understood that determining this information for each form “*enhance[s] the results of the obtaining*” because this information “*facilitate[s] subsequent searching operations through content which is accessible through the web-based forms.*” Halevy, [0036-37]; Fox, ¶102.

POSAs would have recognized that this analysis performed by the crawling process (i.e., the “*enhancing rules*”) is “*appl[ied] via programming code*” because

it is performed by Halevy's form engine that "generally exists on any computer device." Halevy, [0034-35], [0037]; Fox, ¶103.

d. [1C]

- i. mapping the plurality of computer-readable field identifiers to one another using a set of normalized variables stored in a normalized variable data database, ...**

As discussed *supra* §§VI.B.1 and VI.D.1.b, Halevy's crawling process categorizes webpages and forms into a "schema" (i.e., a model/structure) consisting of a "search ontology" (SO) of "classes and properties." Halevy, [0038]; *see* Uschold (Ex-1013), p.1 (defining and explaining "ontology" and "database schema"). The "SO-classes" are identified for each form and used to *map* the fields in the form (i.e., "*the plurality of computer-readable field identifiers*") *to one another using* "SO-properties," as shown below in annotated Figure 3. Halevy, [0039-41], [0045], [0049], [0062], [0067]; Fox, ¶104.

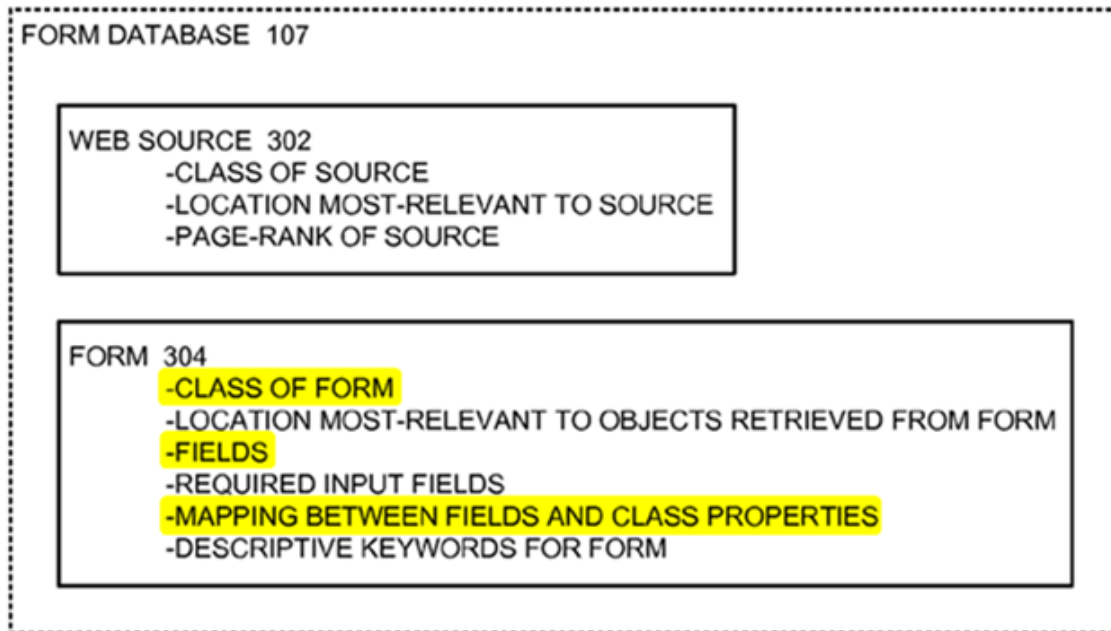


FIG. 3

The SO-properties are associated with SO-classes and are derived from “output properties,” described as “the type of information ... obtain[ed]” from querying a form. Halevy, [0048], [0062], [0067]. As discussed *supra* §VI.B.3, multiple different forms on different websites can map to the same SO-classes, and likewise, fields from different forms can map to the same SO-properties. Halevy, [0035], [0037], [0067], [0095], Fig. 2; Fox, ¶105. For example, for forms that identify in the SO-class “car,” the fields (i.e., “*the plurality of computer-readable field identifiers*”) are *mapped* to their corresponding SO-properties (i.e., “*a set of normalized variables*”), such as “make” and “model” associated with the “car” SO-class. Halevy, [0095], [0098-101]; Fox, ¶105. Since Halevy’s crawling process maps the fields of various forms to a set of SO-properties associated with the

form's SO-class, POSAs would have recognized the SO-properties to be "*a set of normalized variables*" that are used to "*map[] the plurality of computer-readable field identifiers to one another.*" Fox, ¶106. Further, since the mapping of fields to SO-properties is stored in the form database (*see* Figure 3), POSAs would have recognized that the SO-properties (i.e., "*set of normalized variables*") are "*stored in*" the form database, thus making the form database "*a normalized variable data database.*" Fox, ¶106.

- ii. **"the normalized variable data database representing a universal variable map of searchable classes and attributes of products or services on the Internet, the mapping linking computer-readable field identifiers of the plurality of sites or applications;"**

As discussed *supra* §VI.D.1.d.i, POSAs would have recognized Halevy's form database to be a "*normalized variable data database*" that stores a mapping of SO-properties associated with SO-classes (i.e., "*set of normalized variables*") to fields (i.e., "*computer-readable field identifiers*") found on various website forms (i.e., "*plurality of sites or applications*") analyzed by the crawling process. Halevy, [0043-49], [0067], Fox, ¶107.

Halevy's disclosure of a form database where corresponding fields from different forms on different websites map to the same SO-properties would have been recognized by POSAs as what the '378 patent describes as a *universal variable map*. *See* Ex-1001, 17:42-46 ("Variations of linking data variables and

fields may include a source form, a destination form, *a single source to many destination form*, many sources to one destination form[.]”); Fox, ¶108. Thus, Halevy’s form database is a “*universal variable map*” that “*link[s] computer-readable field identifiers of the plurality of sites or applications*” because form fields (including parameter names) from different websites are linked to each other in the form database by being mapped to the same SO-properties associated with an SO-class. Fox, ¶108.

Halevy further teaches that the form database “*represent[s] a universal variable map of searchable classes and attributes of products or services on the Internet*” because as noted *supra* §§VI.B.3 and VI.C, Belanger’s “application server” (Belanger, [0106-07]) reads data entered by the user in a form on Belanger’s website and uses that data to query Halevy’s form database to retrieve a list of deep-links, each to a “form of interest.” Halevy, Abstract, [0137-38]; Fox, ¶109. As discussed *supra* §VI.C, the query submitted to Halevy’s form database (including user-entered data from Belanger’s website as query keywords) *maps* the keywords to “properties of the chosen search[-ontology] class” identified for the query. Halevy, [0089], [0136-38]; Fox, ¶109. POSAs would have recognized that Halevy’s SO-classes are “*classes ... of products or services on the Internet*” because they are determined for each form based on the “types of objects that can be obtained by querying the form” (e.g., books, hotels, restaurants, houses, jobs,

cars, etc.). Fox, ¶109; Halevy, [0045]. POSAs also would have recognized that Halevy’s SO-properties are “*attributes of products or services on the Internet*” because they “specify the type of information” obtained from querying the form such as SO-properties of “make” and “model” for the SO-class of “cars.” Fox, ¶109; Halevy, [0095], [0098-101].

POSAs would have recognized that this same process applies to “applications” because it was known in the art (as acknowledged by the ’378 patent) that “fields or variables on the publisher site or mobile app” would have been obtained and processed in the same manner using known communication protocols like SOAP. Fox, ¶110; Ex-1001, 1:48-53, 2:63-3:15, 3:64-66; *see also* Tidwell, 10-12 (describing using SOAP to provide web services to web-based applications from “an Application Service Provider’s vast server farm to a PDA”).

e. [1D]

i. **“automatically programmatically generating a deep-linked ad utilizing the universal variable map, ...”**

As discussed *supra* §VI.C, promotions displayed on Belanger’s webpages (e.g., Fig. 53) are *deep-linked ads*, and Belanger/Halevy discloses “*automatically programmatically generating*” these ads. Fox, ¶111.

Specifically, in Belanger/Halevy, Belanger’s “application server” determines content displayed on its webpages, including promotions having deep-links

generated by querying Halevy’s system with values in the query mapped to corresponding parameter names in each returned deep-link. *Supra* §VI.C; Fox, ¶112. POSAs would have recognized Belanger’s promotions with Halevy-generated deep-links to be *deep-linked ads*. Fox, ¶112. POSAs would have understood that these ads are *automatically programmatically generated* by Belanger’s application server because the “servlet” running on the application server “interacts with the databases to gather necessary information for ... the particular data that should appear on the page” (Belanger, [0108]), which in combination with Halevy, would have included querying Halevy’s system for deep-links. Fox, ¶112. Thus, Belanger/Halevy discloses “*automatically programmatically generating a deep-linked ad.*”

As also discussed *supra* §VI.C, Belanger queries Halevy’s form engine via a web service protocol (SOAP/XML) during the booking process. Belanger, [0024], [0110]; Fox, ¶113. Halevy’s form engine then accesses its form database. Halevy, [0034]. As discussed *supra* §§VI.B.2 and VI.D.1.d, Halevy’s form database meets the claimed “*universal variable map*” and Belanger’s “application server” *utilizes* the form database because Belanger’s “servlet” on the “application server” (Belanger, [0106-07]) communicates reservation data (e.g., date and location) as keywords in a query using SOAP/XML to Halevy’s form database to perform a “lookup” to retrieve a one or more deep-links, each pointing to a “form of interest”

(Halevy, Abstract, [0137-38]). *Supra* §VI.C; Fox, ¶114. Thus, POSAs would have recognized that Belanger’s server in the combination *utilizes* Halevy’s “form database” in *generating* deep-linked ads. Fox, ¶114.

- ii. **“the deep-linked ad linking one or more of a set of computer-readable field identifiers used by a first site or application with one or more of a set of computer-readable field identifiers used by a second site or application;”**

As discussed *supra* §§VI.B.1 and VI.D.1.b, Halevy’s process for creating the form database “obtains web-based forms to be searched ... from a number of sources,” including “crawl[ing] through web sites to identify web-based forms, ... receiv[ing] manually provided web-based forms,” and “find[ing] web-based forms through methods other than crawling.” Halevy, [0009]. POSAs would have recognized that Belanger’s own website (*i.e.*, “*a first site or application*”) would have been included in Halevy’s form database because Belanger’s form on its website (*i.e.*, “*a set of computer-readable field identifiers used by a first site*”) is one of “a number of sources” for “identif[ying] web-based forms.” Halevy, [0035]; Belanger, [0122]; Fox, ¶116. Likewise, to the extent Belanger’s form webpage (e.g., Fig. 37) was not previously crawled by Halevy’s system, a POSA would have found it obvious (prior to utilizing Halevy as a web service) to provide Belanger’s form webpage to Halevy’s system (*see* Halevy, [0035]) to provide

Belanger’s reservation website with the ability to submit queries for deep-links for its own promotions. Fox, ¶116.

An advertised promotion generated using Belanger/Halevy for presentation at the end of or during the booking process contains a deep-link to another vendor’s website (e.g., an amusement park, hotel, or airline website) and as such, maps fields from Belanger’s reservation form (e.g., Fig. 37) to corresponding fields in a form on a vendor’s website. Fox, ¶117. For instance, in the exemplary use of Belanger/Halevy discussed *supra* §VI.C, the promotion served on Belanger’s webpages (e.g., promotional deep-link 318 in Fig. 53), which is a *deep-linked ad* as discussed *supra* §VI.D.1.e.i, includes a deep-link retrieved by querying Halevy’s form database with keywords including user-entered data (e.g., the date and location values from the fields on Belanger’s reservation web form), which returns a deep-link to a “form of interest” with the keywords mapped (via the SO-properties identified for the keywords and form fields) to corresponding parameter names of the form at the deep-link. Fox, ¶117; Halevy, [0136-38]. POSAs would have recognized Belanger’s promotions with Halevy’s deep-links to be a “*deep-linked ad linking one or more of a set of computer-readable field identifiers used by a first site or application with one or more of a set of computer-readable field identifiers used by a second site or application*” because the deep-link in the promotion includes date and location values entered by the user in the fields on

Belanger's reservation web form (e.g., Fig. 37) and, via the deep-link, the user would have been directed to a vendor website with corresponding fields (e.g., date and location) in the vendor's form set to those values. Fox, ¶118.

f. [1E] “placing the deep-linked ad on a page of the first site or application;”

Belanger's “website” discloses a *first site or application*. Belanger, Abstract, [0020]; Fox, ¶119.

As explained *supra* §VI.D.1.e.i (limitation [1D]), Belanger's “servlet” on the “application server” generates the *deep-linked ad* as part of deciding “data that should appear on the page,” which includes the “promotion[s]” with deep-links. Belanger, [0107-08], [0128], Fig. 53 (showing an example webpage with promotional deep-link 318); Fox, ¶120. As discussed *supra* §VI.C, POSAs would have understood that Belanger/Halevy would have displayed deep-linked ads on Belanger's webpages resulting from Belanger's application server generating a promotion that includes a deep-link queried from Halevy's form database. Thus, Belanger/Halevy discloses “*placing the deep-linked ad on a page of the first site or application.*” Fox, ¶120.

g. [1F] “and in response to user interaction with the deep-linked ad on the page of the first site or application on a user device:”

The claimed *deep-linked ad* is the “promotion” shown on Belanger's webpages or application (e.g., Fig. 53 or another webpage) with a deep-link

generated by querying Halevy's system. *Supra* §VI.D.1.e.i (limitation [1D]).

Belanger discloses that a “customer[]” or “*user*” of its website may “select” deep-links in the promotions, *i.e.*, *interact with* them. Belanger, Abstract, [0019]; Fox,

¶121. This interaction happens *with the deep-linked ad on the page of the first site or application on a user device*, since it happens on a webpage generated by

Belanger's reservation website, which is the claimed *first site*. *See supra* §VI.D.1.f

(limitation [1E]). POSAs familiar with web browsers would have understood that

ads are displayed on *a user device* because Belanger discloses that users access its website through “customer computers” or “user computer[s].” Belanger, [0106],

claim 1; Fox, ¶121.

As explained *infra* §§VI.D.1.h-VI.D.1.j, the steps that happen *in response to* the user selecting the deep-link in Belanger's promotion meet the remaining

limitations of claim 1. Fox, ¶122.

- h. [1G] “extracting, from the user interaction with the deep linked ad on the page of the first site or application, values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application;”**

As discussed *supra* §§VI.D.1.e and VI.C, *placing* an ad on Belanger's reservation website (e.g., Fig. 53 or another page) would have resulted in one or more promotions, each having a deep-link to a vendor's website (generated by querying Halevy's form database) with user-entered values (e.g., the date and

location) entered on Belanger’s website (e.g., the Fig. 37 webpage) mapped to corresponding parameter names in each deep-link. Fox, ¶123. These date and location values are “*values corresponding to one or more of the first set of computer-readable field identifiers*” because they are the values entered into the fields in the Fig. 37 webpage (i.e., associated with each field’s parameter name), which are the “*set of computer-readable field identifiers used by the first site.*” See *supra* §VI.D.1.e (limitation [1D]).

POSAs would have understood that Halevy’s deep-links include Belanger’s date and location values (as would have been used by Belanger’s application server to query Halevy’s form database), and that these values would have been *extracted from* Belanger’s website, for two alternative reasons. First, POSAs would have recognized that these values would have been *extracted from* Belanger’s website *in response* to selecting the deep-linked ad because Halevy teaches that for deep-links to websites that use JavaScript, selecting the deep-link directs a server to construct an “invocation string” that “submit[s] the form automatically on behalf of the user” by concatenating the deep-link’s parameters “and their mapped words or internal value” to the invocation string and passing the completed string back to the browser to invoke the form. Fox, ¶124; Halevy, [0127-28]. Alternatively, under Patent Owner’s apparent construction in litigation, the browser loading the deep-link in the browser to invoke the form to pass the parameter values from the deep-

link to the form constitutes *extracting* the values *from* the website *in response to the user selecting the deep-link ad*. Fox, ¶125; Ex-1021, 33 (infringement contention citing similar functionality); Ex-1022, 32 (same); Ex-1023, 24 (same). The Board need not determine whether Patent Owner’s apparent construction is correct, as the limitation is met regardless.

i. [1H] “automatically directing the user device to display a page of the second site or application; and”

As discussed *supra* §VI.C and VI.D.1.g, the user’s browser in Belanger/Halevy is taken to the vendor website, *i.e.*, the *page of the second site or application, in response to the user interacting with the deep-linked ad* by clicking a promotional deep-link. Fox, ¶126. POSAs would have understood that taking the user to the vendor website indicated by the URL in the deep-link in response to the user clicking the promotion constitutes *automatically directing the user device to display* the vendor website or application. As explained *supra* §VI.D.1.g, the user accesses Belanger’s reservation website via a computer. Furthermore, POSAs would have understood that the user uses a “browser” application on the computer to access Belanger’s website, and thus would have recognized that a standard feature of a browser is that when a user clicks the link, the browser automatically directs the user to the website at that link without the need for further user intervention. Fox, ¶127; Jha, [0168]; Becker, 1.

- j. [1I] “passing the values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application to the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application such that the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application are determined using the universal variable map and such that one or more fields on the page of the second set or application are explicitly or implicitly pre-populated with the values extracted from the user interaction with the deep linked ad on the page of the first site or application without necessitating any pre-existing relationship between the pages.”

POSAs would have understood Halevy to teach that a web form at a website can be automatically invoked using a “query-through link” including an “invocation string” containing field names (i.e., *computer-readable field identifiers*) set to certain values. *Supra* §§VI.B.3, VI.D.1.h; Halevy, [0022-23], [0123]; Fox, ¶128. In the case of the ad served on Belanger’s webpages (e.g., Fig. 53) including a vendor deep-link with corresponding field names (i.e., *computer-readable field identifiers*) set to the date and location values (i.e., *values corresponding to the one or more of the set of computer-readable field identifiers*), POSAs would have understood that the process of creating an invocation string that invokes the form in the deep-link includes *passing* the date and location values that had previously been entered by the user in the fields on Belanger’s website

(e.g., Fig. 37) via the deep-link to corresponding fields on a form at the vendor's website. Fox, ¶128.

In Belanger/Halevy, the invocation string constructed for the deep-links includes values provided on the Figure 37 webpage (e.g., the date and location values), and each deep-link is used to invoke the form on the vendor website with the values prepopulated in their corresponding fields to return a results page. Halevy, [0138], [0143]; Fox, ¶129; *supra* §VI.C. In view of Halevy's above-discussed teachings regarding how form invocation works to display a results page by prepopulating a form's fields with the values in the deep-link (*see* Halevy, [0138], [0143]), POSAs would have understood this process to involve "*passing the values corresponding to one or more of the set of computer-readable field identifiers used by the first site or application*" (e.g., date and location values of the corresponding fields from Belanger's reservation website) "*to the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application*" (e.g., date and location fields on the form at the vendor's website) in order to display the results from automatically searching the form at the vendor's website. Because the user in this case does not see the form, POSAs would have recognized that "*one or more fields on the page of the second set or application*" (e.g., the form invoked on the vendor's website) are "*implicitly pre-populated with the values extracted from the user interaction with the deep*

linked ad on the page of the first site or application” (e.g., as discussed *supra* §VI.D.1.h) to return the results of querying the form. Fox, ¶129.

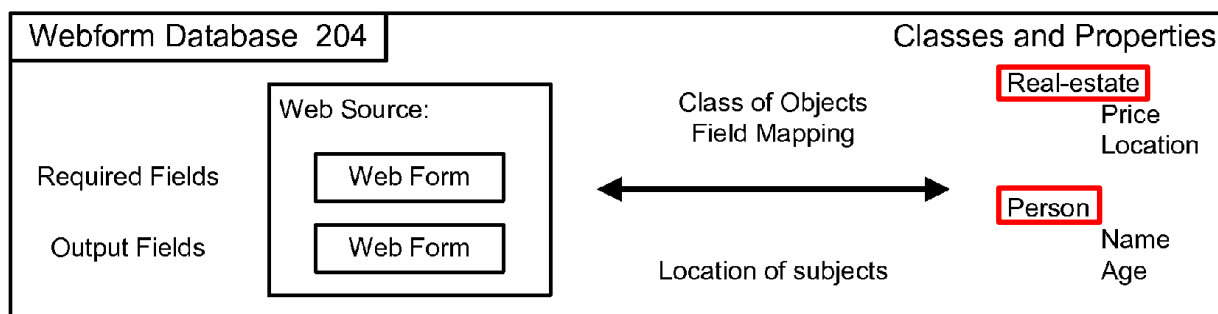
Halevy also teaches that fields on the form at the vendor’s site (e.g., the vendor’s web form) can be “*explicitly*” prepopulated since the invocation string can direct the user to “*a partially filled form and therefore expedite the query answering process (or correct the inputs to the form, if necessary)*.” Halevy, [0143] (emphasis added). In this case, POSAs would have understood the values in the deep-link to be *explicitly* prepopulated in corresponding fields of the partially filled form displayed to the user. Fox, ¶130.

As discussed *supra* §§VI.D.1.d and VI.D.1.e, Belanger/Halevy teaches that deep-linked ads *link* the sets of computer-readable field identifiers used by the first and second sites via the form database, which is a *universal variable map*. POSAs thus would have understood Belanger/Halevy to disclose that “*the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application are determined using the universal variable map.*” Fox, ¶131. Further, since Halevy teaches that its form database is created via crawling webpages and forms from various unrelated websites (Halevy, [0039-49], [0057-58], [0095]), POSAs also would have understood the form database’s creation, and thus the linking between fields on various forms, to occur “*without necessitating any pre-existing relationship between the pages.*” Fox, ¶131.

2. Claim 2

a. [2A]

Limitation [2A] recites “*plurality of sites or applications is categorized by a plurality of verticals, sub-verticals or product or service categories.*” Halevy’s form database categorizes webpage forms into a hierarchy of SO-classes based on the “types of objects that can be obtained by querying the form” (e.g., books, hotels, restaurants, houses, jobs, cars, etc.). Fox, ¶133; *supra* §VI.D.1.d.ii; Halevy, [0038], [0045], [0057-58], *see, e.g.*, Fig. 2 (in part below showing classes for “Real-estate” and “Person”).



Halevy’s SO-classes are similar to the ’378 patent’s description of “verticals.” Ex-1001, 8:34-36 (“An example of list entries for verticals can be Travel, Real Estate, Cars, Jobs, etc.”); Fox, ¶134. Thus, POSAs would have recognized Halevy’s hierarchy of SO-classes of the crawled web forms to be “*categorized by a plurality of verticals.*” Fox, ¶134.

b. [2B]

Limitation [2B] recites that claim 1’s “*generating*” comprises “*selecting one or more*” from the list that the “*plurality*” is “*categorized by*” as recited in [2A]. Belanger/Halevy *generates the deep-linked ad* by querying Halevy’s form database with values entered by the user into Belanger’s website. Halevy, Abstract, [0137-38]; Fox, ¶136; *supra* §VI.D.1.e. As discussed *supra* §VI.D.2.a, Halevy’s hierarchy of SO-classes form a “*plurality of verticals*.”

Halevy’s process for searching the form database includes “*selecting one or more verticals*” because an SO-class is identified for a query, as discussed *supra* §§VI.B.3 and VI.C. This SO-class is then used to “map the individual words in the query to properties of the chosen search class.” Halevy, [0112]; Fox, ¶136.

3. Claim 3

Claim 3 recites that the “*selecting*” in claim 2 “*comprises examining meta tags associated with a site or application*.” As discussed *supra* §VI.D.2.b, searching Halevy’s form database with a query from Belanger’s website involves specifying an SO-class, which meets claim 2’s “*selecting one or more verticals, sub-verticals or product or service categories*.” Fox, ¶137.

In the ’378 patent, “*meta tags*” are used “for selection of an appropriate vertical schema in the automated generation of deep-linked ads” by “checking [the site’s] meta tags.” Ex-1001, 11:27-30, 13:1-7.

In Belanger/Halevy, a deep-linked ad is similarly generated based on selecting an SO-class, which is determined for a web form by Halevy’s crawler “obtaining metadata about an identified form” and computing “word vectors” based on both the “entire web page” and the form. Halevy, [0016], [0058]. Halevy’s determining of an SO-classes from analyzing the entire webpage would have been understood by POSAs to include “*selecting a vertical ...*” by “*examining meta tags*” on the webpage “*associated with a site or application.*” Fox, ¶138.

4. Claim 4

Belanger/Halevy adds forms to its form database (i.e., “*universal variable map*”) via Halevy’s crawling process that analyzes webpages for web forms, categorizes each form to an SO-class, and *maps* the form’s fields to SO-properties (i.e., “*normalized variables*”) associated with the SO-class. Halevy, [0067], Fig. 3; Fox, ¶139; *Supra* §§VI.D.1.b–VI.D.1d. When adding new forms to the database, Halevy’s crawling process “captures” the “[f]ields in the form” including each field’s “parameter name” (i.e., “*field identifier*”). Halevy, [0039-44]; Fox, ¶139. POSAs thus would have understood Halevy’s crawling process to “*map*” claim 1’s “*field identifiers*” to “*normalized variables in the universal variable map*” as claim 4 requires. Fox, ¶139.

POSAs recognized that Halevy’s crawling process “*programmatically search[es] and scan[s]*” for “*field identifiers*” because forms are added to the form

database by the crawling process “pursu[ing] hyperlinks recursively starting from a seed page” to “discover[] content which is especially appropriate” and processing the forms “to extract the text corresponding to the fields in the form.” Halevy, [0081-82], [0051-53]; Fox, ¶140. Halevy also teaches “*programmatically ... receiv[ing] or gather[ing]*” field identifiers because web forms can be received by the form engine or found “through methods other than crawling,” such as obtained from “a set of candidate web sources.” Halevy, [0035], [0051]; Fox, ¶140.

5. Claim 5

Claim 5 recites that claim 4’s “*programmatic mapping*” is “*based on heuristic patterns of typical forms and field identifiers on the Internet.*” The ’378 patent describes heuristic patterns as rules that refine what is inferred “about forms and schemas and variables” (Ex-1001, 14:52-56) such as form categorization (*id.*, 14:57-67), data types of fields (*id.*, 15:10-20), and field proximity patterns (*id.*, 16:1-7). Fox, ¶141.

As discussed *supra* §VI.D.1.c, Halevy teaches “*mapping field identifiers in the universal variable map to normalized variables*” in its process of mapping fields to SO-properties (i.e., “*normalized variables*”) associated with an SO-class in the form database (i.e., “*universal variable map*”). See Halevy, [0039-67]; Fox, ¶142. This mapping process uses several different rules. For example, one rule categorizes forms into SO-classes “to predict which kinds of objects would be

found in the database queried by the form” by computing a two-word vector for each form based on “a word vector for the entire page ..., and a word vector for the form that includes just the words that appear in the form and just before and after the form.” Halevy, [0057], [0058]. Once the form’s class is determined, Halevy uses other rules to predict a “mapping between the fields in the form and the SO-properties of the SO-classes that the form had been mapped to.” *Id.*, [0062-66]. These rules are implemented by an “internal name matcher,” “visible text matcher,” and “instance matcher.” *Id.*, [0063]. POSAs would have recognized that these rules mapping forms and fields to SO-classes and SO-properties are “*heuristic patterns of typical forms and field identifiers on the Internet.*” Fox, ¶142.

Halevy also teaches that its rules (i.e., heuristic patterns) are “*adaptable based on the accuracy of mapping*” as claim 5 requires because these rules use “training data” from a set of candidate sources that can be “shown to a human annotator who can certify the database contents and can change them if necessary.” Halevy, [0051], [0055], [0058], [0064]; Fox, ¶143.

6. Claim 6

As discussed *supra* §VI.D.1.d.ii, Halevy’s form database is a “*universal variable map*” of claim 1 that categorizes forms from various Internet websites and applications into a searchable hierarchy of SO-classes (i.e., “*searchable classes ... on the Internet*”) and SO-properties (i.e., *searchable ... attributes of products and*

services”). Halevy, [0045], [0095], [0098-101], [0136-37]; Fox, ¶144. POSAs thus would have understood the form database to comprise a “*database containing classes and instances for products and services searchable on the Internet*” as claim 6 requires. Fox, ¶144.

7. Claim 9

As discussed *supra* §VI.D.1.g, Belanger/Halevy teaches “*user interaction with the deep-linked ad*” by the user “*explicitly ... selecting the deep-linked ad*” on Belanger’s website displayed in the user’s browser, thus satisfying claim 9, which requires “*explicitly or implicitly selecting*” the ad. Belanger, Abstract, [0019]; Fox, ¶145.

8. Claim 10

As discussed *supra* §VI.A, Belanger teaches displaying deep-linked promotions on its website. As shown in Figure 53 these promotions are displayed as text:

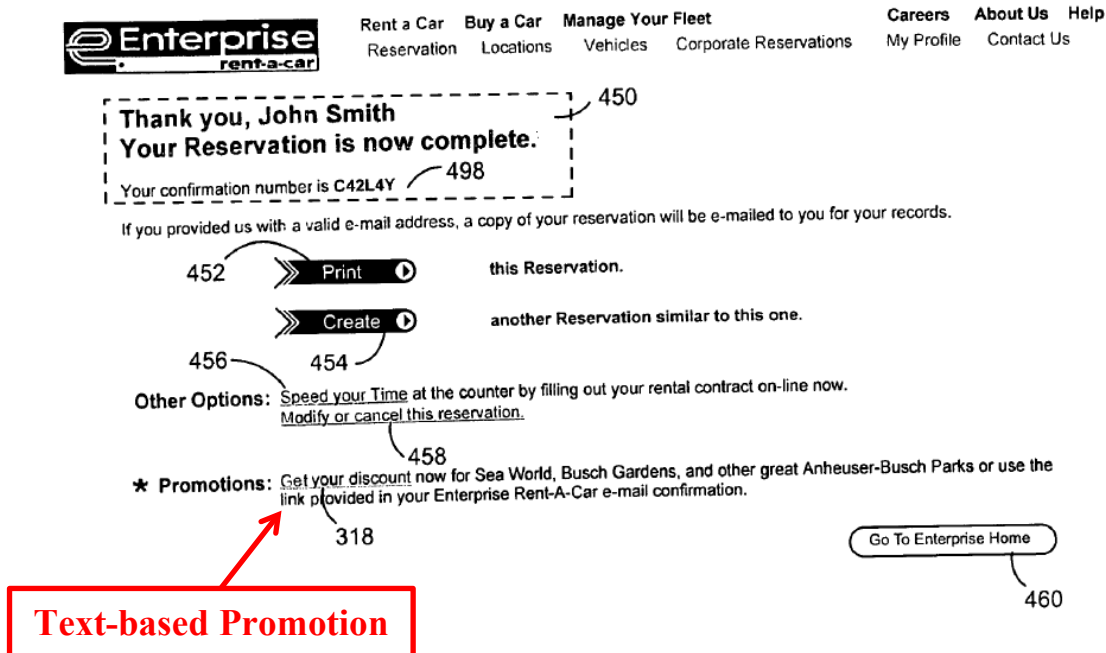


Fig. 53

POSAs would have thus recognized Belanger to teach that its deep-linked promotions (i.e., “*the deep-linked ad*” of claim 1) “*is displayed ... as ... a text ad.*” Fox, ¶147.

9. Claim 11

Claim 11 recites “*the inferring,*” which does not appear in claim 1 from which claim 11 depends. Petitioner reserves the right to challenge claim 11 and similar claims (e.g., claim 21) as indefinite for lack of antecedent basis in other proceedings.

As discussed *supra* VI.D.1.g, Belanger/Halevy teaches “*user interaction with the deep-linked ad*” in the user selecting the promotion with Halevy’s deep-link displayed on Belanger’s webpage. Fox, ¶148. POSAs would have recognized that Halevy’s deep-link includes *a query string* (e.g., the mapping of keywords to

the corresponding fields on the vendor’s website) that is *extracted* from Belanger’s webpage when the promotions is selected and *provided* to Halevy’s process, which *parses the query string* to concatenate the mapped keywords and parameter names to an invocation string for form submission, as discussed *supra* §VI.D.1.h. Fox, ¶148; Halevy, [0127].

As discussed *supra* §VI.D.1.e, Belanger/Halevy generates promotional deep-links by querying Halevy’s form database with keywords including user-entered data. Fox, ¶149. POSAs would have recognized that these keywords are “*values ... used to identify normalized product attributes in the universal variable map*”⁵ because Halevy’s process for querying the form database includes converting the

⁵ To the extent Patent Owner argues that claim 11 requires a specific sequence where “*the values ... from the query string are used identify normalized product attributes*” after interacting with the deep-linked ad, method claims cannot be so limited. *Interactive Gift Express, Inc. v. CompuServe Inc.*, 256 F.3d 1323, 1342 (Fed. Cir. 2001) (“Unless the steps of a method actually recite an order, the steps are not ordinarily construed to require one.”). Further, the ’378 specification lacks disclosure of generating a second deep-link in response to clicking a deep-linked ad. Additionally, a POSA would have understood that such sequencing would unduly and inappropriately slow down system interactions. Fox, ¶149, n.2.

query string to Halevy’s “structured query format” that maps query keywords to SO-properties, as discussed *supra* §VI.B.3. Halevy, [0112]; Fox, ¶149. As discussed *supra* §VI.D.1.d.i, Halevy’s SO-properties in the form database (i.e., a “*universal variable map*”) represent *normalized* variables determined from the “type of information ... obtain[ed]” from a form. Halevy, [0048]. And as discussed *supra* §VI.D.1.d.ii, the SO-properties also include “*attributes of products.*” Fox, ¶149.

10. Claim 12

As discussed *supra* §VII.D.1.9, Belanger/Halevy generates promotions by querying Halevy’s form database with the user-entered values as keywords in the query. Querying Halevy’s form database with user-entered values to obtain deep-links constitutes “*identifying a product or service category using the normalized product attributes in its form database*” as claim 12 requires because Halevy’s query process identifies SO-classes based mapping the query values to SO-properties, as discussed *supra* §VI.B.2. Halevy, [0095], [0136-37]; Fox, ¶150.

As also discussed *supra* §VI.B.2, *forms* are *identified* based on the identified SO-class (i.e., *the product or service category* as recited in claims 12) and its SO-properties. Halevy, [0136-37]; Fox, ¶151. Specifically, Halevy’s form searching process identifies a class from keywords in a submitted query, “map[s] keywords to properties” of the identified class, and “perform[s] a lookup” based on a query

“in the form database to identify forms of interest.” *Id.*, [0136-37], Fig. 6; Fox, ¶151. As discussed *supra* §VI.D.1.b, Halevy’s form database includes forms obtained by crawling multiple websites. POSAs thus would have understood that the deep-links returned from querying the form database includes “*at least one form associated with*” a different website (i.e., *the second site*), as claims 12 requires. Fox, ¶151.

Finally, as discussed *supra* §VI.D.1.f, querying Halevy’s form database with user-entered values from Belanger’s website maps the user-entered values to corresponding form fields in the deep-link. Halevy, [0136], [0123]. As discussed *supra* §VI.D.1.j, the mapped values are passed to the form invoked at the deep-link so that the values prepopulate their corresponding fields based on the mapping. Fox, ¶152; Halevy, [0138]. POSAs would have recognized that Belanger/Halevy’s process of returning a deep-link that maps user-entered values to corresponding fields on a different website *populates the form associated with the second site ... with the values extracted ... from the query string*. Fox, ¶152.

11. Claims 13-16, 19-22

Limitation [13PRE] recites a *system comprising at least one processor and at least one non-transitory computer readable medium*. As discussed *supra* §VI.D.1.a (limitation [1PRE]), Belanger teaches an application server, which a POSA would have understood is a *system*, having *at least one processor and non-*

transitory computer memory, which POSAs would have understood is a *non-transitory computer readable medium*. Fox, ¶153; Belanger, [0106-07].

Belanger also discloses that its application server executes “software” to present its website. Belanger, [0107-08], Fig. 7. Thus, POSAs would have recognized the application server’s memory to “*stor[e] instructions translatable by the at least one processor to perform*” the steps discussed *supra* §§VI.D.1.b-VI.D.1.j, as also required by [13Pre]. Fox, ¶153,

Limitation [13A] is the same as limitation [1A] discussed *supra* §VI.D.1.b except that [13A] adds obtaining “*product or service attributes*” from the sites or applications. Belanger/Halevy also discloses obtaining “*product or service attributes*” from websites analyzed by Halevy’s crawling process because for each form, the crawler obtains “output properties” or “the type of information ... obtain[ed] from answers to a successful form submission.” Halevy, [0048]; Fox, ¶154. POSAs would have recognized that output properties being the types of objects obtained from a form are the “*product or service attributes*” for the product or service offered by the form. *Supra* §VI.D.1.b; Fox, ¶154.

Claim 13 is otherwise identical to claim 1, and every element is met by Belanger/Halevy for the same reasons summarized in the following table and explained in the sections indicated. Fox, ¶155.

Claim 13 Element	Corresponding Claim 1 Element	Section(s)
[13B]	[1B]	VI.D.1.c
[13C]	[1C]	VI.D.1.d.i–VI.D.1.d.ii
[13D]	[1D]	VI.D.1.e.i–VI.D.1.e.ii
[13E]	[1E]	VI.D.1.f
[13F]	[1F]	VI.D.1.g
[13G]	[1G]	VI.D.1.h
[13H]	[1H]	VI.D.1.i
[13I]	[1I]	VI.D.1.j

Certain dependent claims from claim 13 recite identical limitations to the corresponding claim 1 dependents listed below and are met for the same reasons summarized in the following table and explained in the sections indicated. Fox,

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Claim 13 Dependent	Corresponding Claim 1 Dependent	Section(s)
14	2	VI.D.2.a–VI.D.2.b
15	3	VI.D.3
16	6	VI.D.6
19	9	VI.D.7
20	10	VI.D.8
21	11	VI.D.9
22	12	VI.D.10

12. Claims 23-24, 26

Claim 23 is identical to claim 13 except that [23Pre] recites a *computer program product* rather than a *system* and does not recite a *processor*. The software on Belanger’s application server that implements Belanger’s website is a

computer program product, and the remainder of claim 23 is met for the same reasons discussed *supra* §VI.D.9 for claim 13. Belanger, [0107]; Fox, ¶157.

The additional limitations of claims 24 and 26 are identical to the additional limitations of claims 2 and 9, respectively, and are met for the same reasons discussed *supra* §§VI.D.2 and VI.D.7, respectively. Fox, ¶158.

VII. GROUND 2: CLAIMS 1-6, 9-16, 19-24, AND 26 ARE OBVIOUS OVER BELANGER AND APA IN VIEW OF HALEVY

As discussed *supra* §VI.D, Belanger in view of Halevy (Ground 1) renders claims 1-6, 9-16, 19-24, and 26 obvious.

To the extent that explicit disclosure is required regarding travel websites utilizing deep-link advertising, as evidence of the knowledge of the art, the Applicant Admitted Prior Art (“APA”) states that at the time of the ’378 patent, such sites were known, as were mobile applications doing the same. Ex-1001, 2:43-49, 2:64-3:15. Specifically, Applicants admitted that deep-linked-based advertising was known and in use for advertising on “search and E-commerce sites where the user is searching for a product or service,” like the “travel sites” described in Belanger. *Id.*, 2:43-49; Fox, ¶160. With these sites, a user entered search parameters (e.g., “where s/he is traveling from, where to, travel dates, how many people in the party, class of travel, etc.”) and the parameters were “passed along with each ad click to the appropriate advertiser” to “automatically activate

searches from their home page,” thereby deep-linking the user “into their booking process.” Ex-1001, 2:49-57.

These ads worked by mapping the “fields or variables on the publisher site or mobile app” to the “corresponding fields or variables on the advertiser site or mobile apps.” *Id.*, 3:1-4. This mapping was done via manual coding “by developing programmatic integrations between variables and fields” on the publisher’s and advertiser’s websites. *Id.*, 3:6-10. Manual coding was necessary because each website was known to use “its own field descriptors and variable names.” *Id.*, 3:10-15.

POSAs would have recognized the partner and reservation websites described in Belanger to be examples of publisher websites or applications described in the APA, having fields that require manual coding to map their search parameters to the deep-links provided by Belanger so that their search parameter values would have been passed along in the promotional deep-links on Belanger’s reservation website. Fox, ¶162.

POSAs would have known that automating this mapping process would have been more efficient as the APA states that mapping via manual programming was “a time and resource intensive activity that multiplies as the size of the network grows, limiting the size, scale and market adoption for deep-linked ads.” Ex-1001, 3:16-18. POSAs would have thus looked to Halevy to automate this

manual mapping process as Halevy's form database, discussed *supra* §§VI.B and VI.C, maps the forms and fields on various websites to a hierarchy of SO-classes and SO-properties that can be queried with keywords to retrieve deep-links that map the keywords to parameter names of the form at each deep-link to invoke a search on the linked website's form. Fox, ¶163; Halevy, [0038], [0136-38].

VIII. GROUND 3: CLAIMS 7-8, 17-18, AND 25 ARE OBVIOUS OVER BELANGER AND HALEVY IN VIEW OF HAVELIWALA

This ground incorporates the analysis of how claims 1, 13, and 23 are obvious over Belanger/Halevy, as set forth in Ground 1 *supra* §VI.D.1.

A. Haveliwala

Haveliwala (Ex-1019) discloses a search engine that accepts user queries and returns a "set of informational items," including advertisements, relevant to the queries. Haveliwala, 2:47-55. Haveliwala also discloses "client assistant" software, e.g., "Javascript which may be included in the page" (*id.*, 4:46-48) that "monitor[s] user browsing activities in connection with the search results" and provides "such information back to the search engine." *Id.*, 3:6-11.

Haveliwala's server analyzes the information regarding user pointer activity to determine relevancy values for targeted items; for example, a "longer pointer hover" over an informational item may "suggest a more positive opinion from the user about the relevance between the informational item and the user's interest." *Id.*, 4:16-19. This value is then used along with the same or similar search query

“from any client” to “identify a new set of informational items and/or provide them in a different order in accordance with their updated relevancy values.” *Id.*, 3:13-24. These newly generated or refined items are returned to the user’s browser for display. *Id.*, 3:2-7. Thus, POSAs would have understood Haveliwala to teach the monitoring of user pointer activity to detect, for example, a hover action, and then generating or refining search results based on the user’s hover activity. Fox, ¶76.

B. POSAs Motivations to Modify Belanger and Halevy in view of Haveliwala.

As noted *supra* §VI.C, Belanger/Halevy discloses an application server that selects for display promotional deep-links going to websites of other vendors by querying Halevy’s form database with Belanger’s user-entered values for relevant deep-links. Fox, ¶90.

Halevy discloses a desire to rank results including feedback-based prediction on a predominant class but does not specifically disclose generating or refining specific ads of a class based upon user feedback mechanisms. Halevy, [0025], [0143], [0145]; Fox, ¶91. POSAs would have recognized the benefits of further refining individual ad selections of a class to better deliver desired links such as based on user browsing activity relative to actual delivered link. In this regard, Haveliwala teaches a JavaScript solution where hovering time of a mouse pointer over an advertisement was known to provide such feedback to systems such as Halevy, and this solution was known to be beneficial to refine the selection of

more relevant advertisements to users. Fox, ¶91; *see* Haveliwala, 3:12-29. For example, according to Haveliwala, POSAs knew that “when displaying a set of informational items,” items “having high click through rates should be ranked higher, and displayed more prominently” because these items “are more likely to be of interest to the user(s).” Haveliwala, 1:41-46. Haveliwala thus explains that “there is a need for collecting user feedback with respect to informational items presented in response to a search query and adjusting the relevancy values of the items in accordance with the user feedback.” *Id.*, 1:55-60; Fox, ¶91. POSAs would have been motivated by Haveliwala to implement such feedback-based adjustments in Belanger/Halevy to better target ads to users based on the ad’s relevance determined from user interaction for the same reasons discussed *supra* §VI.C by including Haveliwala’s user-generated relevance information to rank the deep-links retrieved by Halevy’s system. Fox, ¶91; *see* Halevy, [0145]; Haveliwala, 7:39-45.

POSAs would have reasonably expected success in such an implementation. As discussed *supra* §§VIII.A, Haveliwala discloses generating or reordering advertisements obtained from a search query based on the user’s pointing activity, where the pointing activity is monitored via software, *e.g.*, JavaScript included in the delivered webpage. It would have been within a POSA’s skill to implement such monitoring capability as JavaScript in the webpages generated by Belanger’s

server because JavaScript was a well-known scripting language used in webpages. Fox, ¶92. Similarly, it would have been within a POSA's skill to include Haveliwala's ranking feature based on user pointing activity in Halevy to improve Halevy's return of deep-links based on both the query submitted to Halevy's system and the relevance of the promotional deep-link determined from pointing activity, since Halevy teaches ranking its deep-links. Halevy, [0145]; Fox, ¶92.

C. Claim 7

As discussed *supra* §VIII.B, Belanger/Havely/Haveliwala discloses Belanger's application server generating deep-linked ads by querying Halevy's form database to return a ranked list of deep-links, that in combination with Haveliwala, include ranking the deep-links based on monitoring user pointer activities on a webpage.

One example of such monitoring includes determining a "longer pointer hover period." Haveliwala, 4:14-19, 4:65-5:11. POSAs would have understood information about actions like hovering to be "*information provided by a user's implicit action on the page of the first site or application*" as claim 7 requires because the '378 patent describes pointing activities like hovering as implicit user actions. Fox, ¶167; Ex-1001, 3:38-48, claim 8 (depending from claim 7 and specifying "*hovering*" as a "*user's implicit action*").

This pointing activity, per Haveliwala, updates an advertisement's relevancy values so subsequent responses from the search engine can "identify a new set" of advertisements" or "provide them in a different order in accordance with their updated relevancy values." Haveliwala, 3:13-24. POSAs would have recognized that identifying new advertisements or providing them in a different order based on relevancy values determined from a user's hover action, when applied to Halevy's ranked list of deep-links, is "*generat[ing] or refin[ing]*" the deep-linked ads "*based on information provided by a user's implicit action*" as claim 7 requires. Fox, ¶168.

D. Claims 17 and 25

Claims 17 and 25 are identical to claim 7 except that they recite "*contextual information*" rather than "*information.*" This is disclosed by Haveliwala for the same reasons discussed *supra* §VIII.C because monitoring the user's pointing activity includes "monitor[ing] a predefined region of the display that is associated with the informational item, and the user's pointer placement activities with respect to that predefined region" to "determine[] a continuous hover period" Haveliwala, 4:62-5:3. POSAs would have recognized the region in which hovering occurs provides context, and that determining a continuous hover period over a specific item to determine a user's interest is determining "*contextual information provided by a user's implicit action.*" Fox, ¶169.

E. Claims 8 and 18

Belanger/Halevy/Haveliwala meets the additional limitation in claims 8 and 18 for the same reasons discussed *supra* §VIII.C for claim 7 because Haveliwala teaches “*the user’s implicit action*” including “*the user hovering over a target of interest on*” a webpage. Haveliwala, 4:14-19, 4:65-5:11; Fox, ¶170.

IX. GROUND 4: CLAIMS 7-8, 17-18, AND 25 ARE OBVIOUS OVER BELANGER, APA, AND HALEVY IN VIEW OF HAVELIWALA

This ground incorporates the analysis of Belanger and APA in view of Halevy over claims 1, 13, and 23, as set forth in Ground 2 *supra* § VII and the analysis of Belanger/Halevy in view of Haveliwala as set forth in Ground 3 *supra* §VIII. This ground additionally renders claims 7-8, 17-18, and 25 obvious for the same reasons as Ground 3, but adds the APA to the extent that explicit disclosure is required regarding travel websites utilizing deep-link advertising, as evidence of the knowledge of the art acknowledged in the ’378 patent discussed for Ground 2. Fox, ¶171.

X. NO BASIS EXISTS FOR DISCRETIONARY DENIAL

A. Section 314(a)

“[T]he PTAB will not deny institution based on *Fintiv* if,” as here, “there is compelling evidence of unpatentability.” Director’s Interim Procedure for Discretionary Denials, 5 (June 21, 2022) (“Interim Procedure”) (discussing *Apple*

Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 (Mar. 20, 2020) (precedential)). That should conclude the *Fintiv* analysis.

If considered, the *Fintiv* factors also weigh against denial.

1. Stay Potential

No stay has been requested. Thus, without “specific evidence” of how the court will rule, this factor is at worst neutral. *Sand Revolution II, LLC, v. Cont’l Intermodal Group–Trucking*, IPR2019-01393, Paper 24, at 7 (June 16, 2020) (informative).

2. Trial Timing

No trial date has been set. Trial would be expected well after a final written decision regardless of the outcome of Petitioner’s pending motion to transfer from Delaware to N.D. Cal. *See* Ex-1010, 2. Median time to trial in Delaware is 32.9 months. *See* Ex-1011, 14. Median time to trial in N.D. Cal. is 48.9 months. *See* Ex-1011, 66.

3. Litigation Involvement

District-court activity has been minimal, with no rulings on Petitioner’s Motion to Dismiss or Motion to transfer. *See* Ex-1010. There has been no exchange of contentions, claim construction activity, or decisions on the merits. *Samsung Elecs. v. Netlist, Inc.*, IPR2022-00063, Paper 13 at 8 (May 5, 2022) (granting institution where no “claim construction and merits determinations” had occurred).

4. Issue Overlap

Given its early stage, the validity issues in the litigation are unknown. However, Petitioner challenges all claims, whereas Metarail’s complaint only identifies one asserted claim. Ex-1012, ¶55. This weighs against denial. *Markforged Inc. v. Continuous Composites*, IPR2022-00679, Paper 7, at 32-33 (Oct. 25, 2022).

5. Litigation Defendants

That Petitioner is the defendant in the district-court proceeding “is far from an unusual circumstance.” *Sand Revolution II*, at 12-13. This factor is neutral.

6. Other Circumstances

The Petition’s “strong showing on the merits” weighs against denial. Interim Procedure, 3-5.

B. Section 325(d)

No basis exists for denial under Section 325(d). While Stephens (Ex-1016) (U.S. Pub. 2007/0239494) is cited in the ’378 patent, was applied by the Examiner during prosecution, and lists Belanger as “related” and incorporated by reference (Stephens, [0001]), Stephens is not in the same family as Belanger and does not include the same disclosure. The Examiner applied paragraphs [0007-08], [0053], [0056-62], [0135], and Fig. 2 of Stephens. Ex-1002, 206-19, 283-93, 325-35. These portions describe division-specific deep-links for a customer manually created by an administrator. These portions do not describe Belanger’s website as

the claimed *first site*, repurposing user-entered data in the fields in Belanger's website, nor Belanger's website hosting promotional deep-links to other travel websites by querying Halevy's form database, as applied above. Thus, Belanger, as applied here, is not cumulative Stephens.

Moreover, neither Halevy, Haveliwala, nor Jones were cited or applied during prosecution, nor were any cumulative references considered. Thus, this Petition provides new art and arguments not previously considered and no basis exists for discretionary denial. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (Feb. 13, 2020) (precedential).

XI. CONCLUSION

The Board should institute review and cancel claims 1-26.

Dated: October 2, 2024

Respectfully submitted,
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XII. CLAIM LISTING

The following claim listing assigns element labels (e.g., [1A1], [1A2], etc.) to certain claims for clarity.

Claim 1
[1PRE] A method, comprising:
[1A] at and by a server computer operating in a network environment and having at least one processor and non-transitory computer memory:
[1B] obtaining, utilizing a set of obtaining rules, a plurality of explicit or implicit computer-readable field identifiers from a plurality of sites or applications on the Internet;
[1C] applying via programming code a set of enhancing rules to enhance results of the obtaining of the plurality of computer-readable field identifiers;
[1D] mapping the plurality of computer-readable field identifiers to one another using a set of normalized variables stored in a normalized variable data database, the normalized variable data database representing a universal variable map of searchable classes and attributes of products or services on the Internet, the mapping linking computer-readable field identifiers of the plurality of sites or applications;
[1E] automatically programmatically generating a deep-linked ad utilizing the universal variable map, the deep-linked ad linking one or more of a set of computer-readable field identifiers used by a first site or application with one or more of a set of computer-readable field identifiers used by a second site or application;
[1F] placing the deep-linked ad on a page of the first site or application; and
[1G] in response to user interaction with the deep-linked ad on the page of the first site or application on a user device:
[1G1] extracting, from the user interaction with the deep-linked ad on the page of the first site or application, values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application;
[1G2] automatically directing the user device to display a page of the second site or application; and

[1G3] passing the values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application to the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application such that the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application are determined using the universal variable map and such that one or more fields on the page of the second set or application are explicitly or implicitly pre-populated with the values extracted from the user interaction with the deep-linked ad on the page of the first site or application without necessitating any pre-existing relationship between the pages.

Claim 2

The method according to claim 1, wherein the plurality of sites or applications is categorized by a plurality of verticals, sub-verticals or product or service categories, and wherein generating the deep-linked ad comprises selecting one or more verticals, sub-verticals or product or service categories of the plurality of verticals, sub-verticals or product or service categories.

Claim 3

The method according to claim 2, wherein selecting a vertical, sub-vertical or product or service category of the plurality of verticals, sub-verticals or product or service categories comprises examining meta tags associated with a site or application.

Claim 4

The method according to claim 1, wherein field identifiers are programmatically searched or scanned or received or gathered or inferred by content and mapped to normalized variables in the universal variable map.

Claim 5

The method according to claim 4, wherein the programmatic mapping of field identifiers to normalized variables in the universal variable map is based on heuristic patterns of typical forms and field identifiers on the Internet, the heuristic patterns being adaptable based on the accuracy of mapping.

Claim 6

The method according to claim 1, wherein the universal variable map comprises a database containing classes and instances of products and services searchable on the Internet.

Claim 7

The method according to claim 1, wherein the deep-linked ad is generated or refined based on information provided by a user's implicit action on the page of the first site or application.

Claim 8
The method according to claim 7, wherein the user's implicit action comprises the user hovering over a target of interest on the page of the first site or application.
Claim 9
The method according to claim 1, wherein the user interaction with the deep-linked ad comprises the user explicitly or implicitly selecting the deep-linked ad.
Claim 10
The method according to claim 1, wherein the deep-linked ad is displayed on the page of the first site or application as a product ad, a banner, an icon, an animated ad, a text ad, a check box, a link, a form, a video clip, or any element of interest.
Claim 11
The method according to claim 1, wherein the user interaction with the deep-linked ad provides a query string, wherein the extracting or inferring includes parsing the query string, and wherein the values extracted or inferred from the query string are used to identify normalized product attributes in the universal variable map.
Claim 12
[12PRE] The method according to claim 11, further comprising:
[12A] identifying a product or service category using the normalized product attributes in the universal variable map;
[12B] identifying at least one form associated with the product or service category, the at least one form associated with the second site or application; and
[12C] populating the at least one form associated with the second site or application with the values extracted or inferred from the query string.
Claim 13
[13PRE] A system, comprising:
[13A] at least one processor; and
[13B] at least one non-transitory computer readable medium storing instructions translatable by the at least one processor to perform:
[13C] obtaining, utilizing a set of obtaining rules, a plurality of explicit or implicit computer-readable field identifiers or product or service attributes from a plurality of sites or applications on the Internet;
[13D] applying via programming code a set of enhancing rules to enhance results of the obtaining of the plurality of computer-readable field identifiers;

[13E] mapping the plurality of computer-readable field identifiers to one another using a set of normalized variables stored in a normalized variable data database, the normalized variable data database representing a universal variable map of searchable classes and attributes of products or services on the Internet, the mapping linking computer-readable field identifiers of the plurality of sites or applications;
[13F] automatically programmatically generating a deep-linked ad utilizing the universal variable map, the deep-linked ad linking one or more of a set of computer-readable field identifiers used by a first site or application with one or more of a set of computer-readable field identifiers used by a second site or application;
[13G] placing the deep-linked ad on a page of the first site or application; and
[13H] in response to user interaction with the deep-linked ad on the page of the first site or application on a user device:
[13H1] extracting, from the user interaction with the deep-linked ad on the page of the first site or application, values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application;
[13H2] automatically directing the user device to display a page of the second site or application; and
[13H3] passing the values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application to the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application such that the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application are determined using the universal variable map and such that one or more fields on the page of the second set or application are pre-populated with the values extracted from the user interaction with the deep-linked ad on the page of the first site or application without necessitating any pre-existing relationship between the pages.
Claim 14
The system of claim 13, wherein the plurality of sites or applications is categorized by a plurality of verticals, sub-verticals or product or service categories, and wherein generating the deep-linked ad comprises selecting one or more verticals, sub-verticals or product or service categories of the plurality of verticals, sub-verticals or product or service categories.
Claim 15
The system of claim 14, wherein selecting a vertical, sub-vertical or product or service category of the plurality of verticals, sub-verticals or product or service categories comprises examining meta tags associated with a site or application.

Claim 16
The system of claim 13, wherein the universal variable map comprises a database containing classes and instances of products and services searchable on the Internet.
Claim 17
The system of claim 13, wherein the deep-linked ad is generated or refined based on contextual information provided by a user's implicit action on the page of the first site or application.
Claim 18
The system of claim 17, wherein the user's implicit action comprises the user hovering over a target of interest on the page of the first site or application.
Claim 19
The system of claim 13, wherein the user interaction with the deep-linked ad comprises the user explicitly or implicitly selecting the deep-linked ad.
Claim 20
The system of claim 13, wherein the deep-linked ad is displayed on the page of the first site or application as a product ad, a banner, an icon, an animated ad, a text ad, a check box, a link, a form, a video clip, or an element of interest.
Claim 21
The system of claim 13, wherein the user interaction with the deep-linked ad provides a query string, wherein the extracting or inferring includes parsing the query string, and wherein the values extracted or inferred from the query string are used to identify normalized product attributes in the universal variable map.
Claim 22
[22PRE] The system of claim 21, further comprising:
[22A] identifying a product or service category using the normalized product attributes in the universal variable map;
[22B] identifying at least one form associated with the product or service category, the at least one form associated with the second site or application; and
[22C] populating the at least one form associated with the second site or application with the values extracted or inferred from the query string.
Claim 23
[23PRE] A computer program product comprising at least one non-transitory computer readable medium storing instructions translatable by at least one processor to perform:
[23A] obtaining, utilizing a set of obtaining rules, a plurality of explicit or implicit computer-readable field identifiers or product or service attributes from a plurality of sites or applications on the Internet;

[23B] applying via programming code a set of enhancing rules to enhance results of the obtaining of the plurality of computer-readable field identifiers;
[23C] mapping the plurality of computer-readable field identifiers to one another using a set of normalized variables stored in a normalized variable data database, the normalized variable data database representing a universal variable map of searchable classes and attributes of products or services on the Internet, the mapping linking computer-readable field identifiers of the plurality of sites or applications;
[23D] automatically programmatically generating a deep-linked ad utilizing the universal variable map, the deep-linked ad linking one or more of a set of computer-readable field identifiers used by a first site or application with one or more of a set of computer-readable field identifiers used by a second site or application;
[23E] placing the deep-linked ad on a page of the first site or application; and
[23F] in response to user interaction with the deep-linked ad on the page of the first site or application on a user device:
[23F1] extracting, from the user interaction with the deep-linked ad on the page of the first site or application, values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application;
[23F2] automatically directing the user device to display a page of the second site or application; and
[23F3] passing the values corresponding to the one or more of the set of computer-readable field identifiers used by the first site or application to the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application such that the correspondingly linked one or more of the set of computer-readable field identifiers used by the second site or application are determined using the universal variable map and such that one or more fields on the page of the second set or application are pre-populated with the values extracted from the user interaction with the deep-linked ad on the page of the first site or application without necessitating any pre-existing relationship between the pages.
Claim 24
The computer program product of claim 23, wherein the plurality of sites or applications is categorized by a plurality of verticals, sub-verticals or product or service categories, and wherein generating the deep-linked ad comprises selecting one or more verticals, sub-verticals or product or service categories of the plurality of verticals, sub-verticals or product or service categories.

Claim 25

The computer program product of claim 23, wherein the deep-linked ad is generated or refined based on contextual information provided by a user's implicit action on the page of the first site or application.

Claim 26

The computer program product of claim 23, wherein the user interaction with the deep-linked ad comprises the user explicitly or implicitly selecting the deep-linked ad.

CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (E)(4)

I certify that on October 2, 2024, I will cause a copy of the foregoing document, including any exhibits or appendices filed therewith, to be served via Overnight FedEx at the following correspondence address of record for the patent:

Metarail, Inc.
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#716
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Date: October 2, 2024

/MacAulay Rush/
MacAulay Rush
Paralegal
WOLF, GREENFIELD & SACKS, P.C

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned certifies that the foregoing Petition for *Inter Partes* Review contains 13,939 words excluding a table of contents, a table of authorities, Mandatory Notices under § 42.8, a certificate of service or word count, or appendix of exhibits or claim listing. Petitioner has relied on the word count feature of the word processing system used to create this paper in making this certification.

Date: October 2, 2024

/MacAulay Rush/
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