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Paper 11
Date: April 24, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

METARAIL, INC.,
Patent Owner.

IPR2024-01270
Patent 9,633,378 B2

Before STACEY G. WHITE, FRANCES L. IPPOLITO, and BRIAN P. MURPHY, *Administrative Patent Judges.*

IPPOLITO, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Google LLC ("Petitioner") filed a Petition (Paper 2, "Pet.") requesting *inter partes* review of claims 1–26 of U.S. Patent No. 9,633,378 B2 (Ex. 1001, "the '378 patent"). Metarail, Inc. ("Patent Owner") filed a Preliminary Response (Paper 6, "Prelim. Resp."). The parties also respectively filed a Reply to the Preliminary Response (Paper 7, "Reply") and Sur-Reply (Paper 8, "Sur-Reply").

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the Petition and any response thereto shows "there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition."

Considering the arguments presented and the evidence of record, we conclude that there is not a reasonable likelihood that Petitioner would prevail in challenging at least one of claims 1–26 of the '378 patent as unpatentable under the grounds presented in the Petition. Pursuant to § 314, we hereby do not institute an *inter partes* review as to these claims of the '378 patent.

A. Real Parties in Interest

Petitioner identifies itself as the sole real party-in-interest. Pet. viii. Patent Owner identifies itself as the sole real party-in-interest. Paper 5, 2 (Patent Owner's Mandatory Notice).

B. Related Matters

The parties indicate that the '378 patent is asserted in the following district court litigation: *Metarail, Inc. v. Google LLC*, Case No. 1:23-cv-01116 (DDE). Pet. viii; Paper 5, 2. The parties also indicate that patents related to the '378 patent are asserted in *inter partes* reviews:

IPR2024-01269 (U.S. Patent No. 10,789,626 B2), IPR2024-01271 (U.S. Patent No. 10,262,342 B2), and IPR2024-01272 (U.S. Patent No. 10,152,734 B1). *Id.*

C. The '378 patent (Ex. 1001)

The '378 patent is titled "[d]eep-linking system, method and computer program product for online advertisement and e-commerce." *Id.* at code (54). The '378 patent discloses that for search and E-commerce sites, "[a] recent advancement in Digital Advertising has been 'deep-linked' or 'parameter-based' advertising." *Id.* at 2:43–45. According to the '378 patent, this form of advertising applies "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." *Id.* at 2:46–49. With deep-linking, these search parameters are passed to the advertiser and the advertiser uses these parameters to:

> (a) hyper-target the placement of ads and customize the copy of ads presented on targeted web pages, and (b) automatically activate searches from their home page, thereby landing the web user "deep" into their booking process rather than on their home page as is customary with other forms of ad clicks.

Id. at 2:51–57. Such deep-linked ad connections are conventionally achieved by manually creating "programmatic integrations" between variables, fields, etc., of different websites, e.g., publisher site and advertiser site. *Id.* at 3:6–10.

The '378 patent discloses systems and methods to automate the generation of deep-linked ads. *See* Ex. 1001, 4:8–60. Figure 2, reproduced below, depicts exemplary system architecture 200.

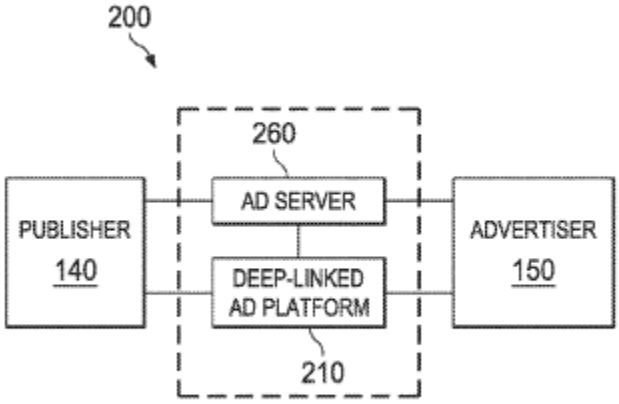


FIG. 2

In Figure 2, system architecture 200 includes deep-linked ad platform 210 and ad server 260. Ex. 1001, 7:57–60. Ad server 260 may prepare or provide ads for advertiser 150 and deep-linked ad platform 210 automatically generates deep-linked ads. *See id.* at 7:55–58, 8:4–7. In operation, this deep-linking method may include "creating and maintaining a universal map of variables and identifiers from sites . . . [and] automatically generating deep-linked ads from the variables and identifiers and other data in the universal variable map" to present deep-linked ads to consumers in real time. *See id.* at 8:17–24, Fig. 3. The '378 patent discloses "one or more asynchronous spiders/scrapers or data gathering interfaces" may interact with websites and applications to obtain information about the variables or identifiers on the websites. *Id.* at 8:62–66. With reference to Figures 4 and 5, the '378 patent further discloses that

> spidering module or data gathering module 510 may look up the Form section of each relevant web page, parse out the names of all the variables or input field identifiers (step 405), and archive them in a database which can be considered a universal variable

> map to all relevant forms and fields across the web sites crawled by the spidering module or data gathering module thus far (step 407).

Ex. 1001, 9:20–27.

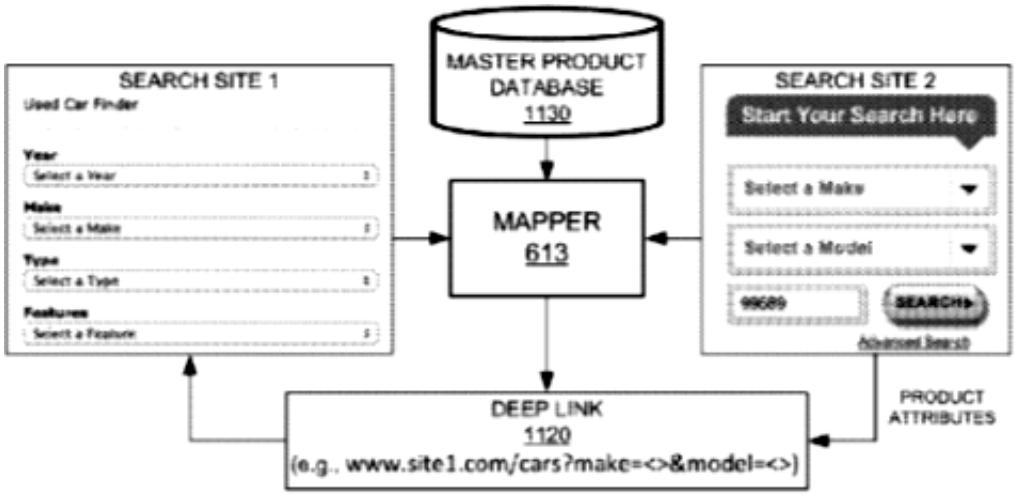
The '378 patent further provides an example with a travel web site where the spidering module has crawled the page, parsed the Form section of the page, and associated form fields with normalized variables in a universal variable map. *Id.* at 9:60–65. Table 1 (reproduced below) shows the data fields from three websites that are associated with normalized variables. *Id.* at 10:1–7.

Web Sites	xxx.com	yyy.net	zzz.org	. . .	Normalized Variables
Variable 1	Orig	Depart_City	From	. . .	from
Variable 2	Dest	Arrival_City	To	. . .	to
Variable 3	. . .	. . .	. . .	. . .	. . .
. . .	. . .	. . .	. . .	. . .	. . .

As shown in Table 1, "Orig," "Depart_City," and "From" are associated with normalized variable "from," whereas "Dest," "Arrival_City," and "To" are associated with normalized variable "to." *Id.* The '378 patent explains that "[t]his database may be considered a universal variable map of all classes and instances of products and services that can be searched and transacted on the Internet." *Id.* at 13:42–45. The '378 patent adds that "[b]y creating this universal schema, if web site A wants to advertise a deep-linked ad for web site B, the Ad system would already know what the respective variable names were called, and could programmatically create an ad with accurate mappings without any human intervention." *Id.* at 13:53–57.

In a further example, Figure 11A, reproduced below, "depicts a diagrammatic representation of example linkages built in an automated

fashion between two sites, where one sites has multiple search fields[.]" *Id.* at 6:61–65.



In Figure 11A, Search Site 2 provides a deep-linked ad for Search Site 1. *Id.* at 13:61–62. Mapper 613 accesses a universal variable map of a master product database 1130, cross-references programming variables used by Search Site 2 with programming variables used by Search Site 1, and automatically creates the deep-linked ad that is displayed on Search Site 2 (shown on right). *Id.* at 13:62–14:3. When the user selects deep link 1120 on Search Site 2, the browser is automatically directed to a network address of Search Site 1 indicated by the deep link. *Id.* at 14:3–7. Responsive to the directing and per the universal map, a correspondingly more-detailed search form is displayed on Search Site 1 (shown on left) with automated entry (prepopulated) of product attributes and user input provided by Search Site 2. *Id.* at 14:7–12.

D. Challenged Claims

Petitioner challenges claims 1–26. Pet. 10. Claims 1, 13, and 23 are independent claims. Claim 1 is reproduced below with the Petition's identifiers (*id.* at 41–60):

1. [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:

[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;

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

[1C] 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;

[1D] 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;

[1E] placing the deep-linked ad on a page of the first site or application; and

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

[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;

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

[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.

Ex. 1001, 22:11–60.

II. PRINCIPLES OF LAW

A. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–26 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–6, 9–16, 19–24, 26	103	Belanger,[1] Halevy[2]
1–6, 9–16, 19–24, 26	103	Belanger, APA,[3] Halevy

[1] U.S. Pat. App. Pub. No. 2005/0144048 A1 published June 30, 2005 ("Belanger") Ex. 1008.

[2] U.S. Pat. App. Pub. No. 2006/0230033 A1 published October 12, 2006 ("Halevy") Ex. 1006.

[3] Petitioner asserts Admitted Prior Art (APA) from the disclosure of the '378 patent. *See* Ex. 1001, 2:43–57, 2:64–3:18.

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
7, 8, 17, 18, 25	103	Belanger, Halevy, Haveliwala[4]
7, 8, 17, 18, 25	103	Belanger, APA, Halevy, Haveliwala

Pet. 13–14. Petitioner also relies on the Declaration of Edward A. Fox, Ph.D. (Ex. 1003). Patent Owner relies on the Declaration of Sam Malek, Ph.D. (Ex. 2001).

B. Obviousness

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under § 103 that requires consideration of four factors: (1) the "level of ordinary skill in the pertinent art," (2) the "scope and content of the prior art," (3) the "differences between the prior art and the claims at issue," and (4) "secondary considerations" of non-obviousness such as "commercial success, long-felt but unsolved needs, failure of others, etc." *Id.* at 17–18. "While the sequence of these questions might be reordered in any particular case," *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the Federal Circuit has "repeatedly emphasized that an obviousness inquiry requires examination of all four Graham factors and that an obviousness determination can be made only after consideration of each factor." *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir. 2016).

We note that, with respect to the fourth *Graham* factor, the current record in this proceeding does not include any argument or evidence directed to secondary considerations of nonobviousness. The analysis below addresses the first three *Graham* factors.

[4] U.S. Pat. No. 7,756,887 B1 issued July 13, 2010 ("Haveliwala") Ex. 1019.

C. Level of Ordinary Skill in the Art

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus. Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner contends that a person of ordinary skill in the art (POSA or POSITA) at the time of the invention of the '378 patent "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[; m]ore education could substitute for experience, and vice versa." Pet. 17 (citing Ex. 1003 ¶ 32).

Patent Owner does not contest Petitioner's proposal. Prelim. Resp. 9 (citing Ex. 2001 ¶¶ 35–36) ("Patent Owner and its expert apply this definition.").

For purposes of this Decision, we adopt Petitioner's proposal as reasonable and consistent with the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art may reflect an appropriate level of skill in the art).

III. CLAIM CONSTRUCTION

In this *inter partes* review, we apply the same claim construction standard "used in the federal courts, in other words, the claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b)," which is articulated in *Phillips v. AWH Corp.*, 415 F.3d

1303 (Fed. Cir. 2005) (en banc). 83 Fed. Reg. 51,340, 51,358 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)). Under the *Phillips* standard, the "words of a claim are generally given their ordinary and customary meaning," which is "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips*, 415 F.3d at 1312–13.

Neither Petitioner nor Patent Owner present claim construction in the Petition or Preliminary Response respectively. Pet. 17; *see generally* Prelim. Resp. Nonetheless, Petitioner contends that Patent Owner's construction of "universal variable map" is too narrow, but does not appear to offer an alternative construction other than to state that a "universal variable map" includes "a database that links variables from different websites to each other." *See* Reply 1–2 (emphasis omitted) ("PO's arguments for why Halevy's 'form database' is not a universal variable map are all premised on improperly narrowing the term's scope by adding restrictions that are unsupported by the intrinsic record.").

In the Sur-reply, Patent Owner reiterates that it has not proposed a construction for "universal variable map." Sur-Reply 1 ("Patent Owner did not present any claim construction arguments regarding that term, nor does that term's construction have any bearing on the arguments set forth in the POPR for denying the Petition.").

Based on our review of the preliminary record, we do not need to construe any terms expressly to reach our decision. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to

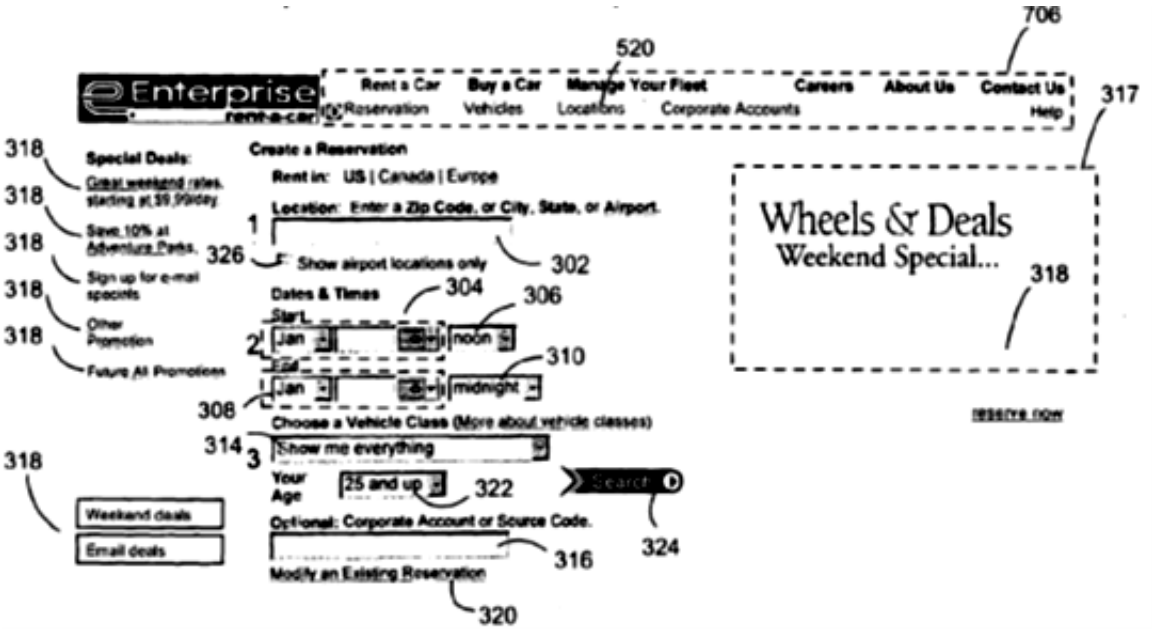
construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

IV. ANALYSIS

A. Summary of References and APA

1. Belanger (Ex. 1008)

Belanger is a U.S. patent application publication titled "Method And Apparatus For Improved Customer Direct On-Line Reservation Of Rental Vehicles." *Id.* at code (54). Belanger discloses a website that guides the customer to provide required information (e.g., car, day/time period, and location sought) for a car reservation transaction. *Id.* ¶¶ 4–5. Figure 37, reproduced below, "is a screenshot of a preferred home page (H)." *Id.* ¶ 56.



Home page H, shown on Figure 37, contains a plurality of fields in which the customer can enter reservation information. *Id.* at Fig. 37. For example, the home page provides a branch location search tool via the "locations" link

520. *Id.* ¶ 165. Upon entering data in any of the fields, the user can submit the data by selecting link 324. *Id.* ¶ 127.

In addition, the user may instead click a link, e.g., the promotional link 318 initiating a reservation transaction per conditions of the promotion. *Id.* ¶¶ 128 ("Additional preferable features for the home page include (1) various promotional links 318 that correspond to any promotions that the rental car company is offering (each promotional link 318 being selectable to initiate a reservation transaction according to the conditions of the promotion)"), 168. Belanger discloses that

> [w]hen a customer selects a promotional link (link 318 shown in some of the screenshots, including H and Conf), it is typical that the promotion has one or more conditions associated therewith. For example, a rental car company may offer a promotion for a reduced rental price for a particular type of vehicle during a specified time period. To promote the promotion, the rental car company may provide hyperlinks on other websites through advertising or the like, or may include promotional links on its own website to attract customers.

Id. ¶ 168. Belanger further discloses that the promotional link initiates the reservation transaction with "the reservation data corresponding to promotional conditions set equal to those conditions, to thereby avoid unnecessarily requiring the customer to enter such data himself/herself or creating a situation where the customer may accidentally enter data that violates the conditions of the promotion." *Id.* ¶ 169. As an example, Belanger discloses that "if a promotion has a condition that the type of vehicle must be 'standard', it is preferable that the customer, upon selection of a link corresponding to that promotion, be linked into the reservation booking process such that the vehicle type is automatically set to 'standard.'" *Id.* With regard to deep-linking, Belanger discloses, referring

to the example in Figure 31, that "[u]pon selection of an icon or link associated with that promotion, the customer is preferably linked to a state where V has been automatically set to 'economy', and the remaining options are to choose a time and location." *Id.*

Belanger further discloses, as shown in Figure 73, that an account or promotion administrator can control a plurality of settings for the pages and rules of a promotion or corporate account. *Id.* ¶ 209. "Through the interface 700, it is preferred that the administrator be able to control nearly all aspects of the pages that a customer sees upon initiating a reservation transaction via a corporate or customer account or promotion." *Id.* ¶ 210, Fig. 73.

2. Halevy (Ex. 1006)

Halevy is a U.S. patent application publication titled "Searching Through Content Which Is Accessible Through Web-Based Forms." *Id.* at code (54). Halevy generally "relates to . . . searches through content on web sites" that may be hidden behind web-based forms and, "[m]ore specifically, . . . searching through content . . . accessible though queries entered into web-based forms." *Id.* ¶¶ 3, 8. Halevy states that data available on the web but "hidden behind web-based forms" are not "searchable by traditional search engines." *Id.* ¶ 5.

Halevy's Figure 1 is reproduced below:

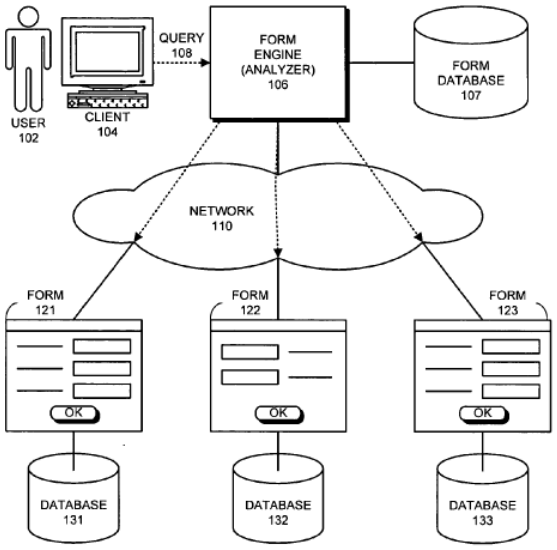


FIG. 1

Figure 1 depicts a form engine that facilitates the process of searching through web-based forms. Ex. 1006 ¶ 26. Halevy discloses that

> *form engine 106 includes a set of tools that facilitate constructing a search engine for the "deep web." The deep web refers to the part of the web that hides behind forms and is therefore not accessible to traditional search engines.* With these tools, both a general-purpose search engine, and domain-specific engines that focus on certain topics, may be constructed.

Id. ¶ 37 (emphases added). Form engine 106 accesses forms 121–123 (e.g., using a web-crawling process) hosted on servers throughout a network 110. *Id.* ¶ 35. Halevy discloses that engine 106 obtains web-based forms of interest and then creates corresponding database entries for those forms in a form database 107. *Id.* User 102 (e.g., a client 104) sends query 108 of keywords to form engine 106. *Id.* ¶ 36. And, in response, form engine 106 uses information within form database 107 to perform a search of content accessible through forms 121–123. *Id.*

Figure 2 is reproduced below:

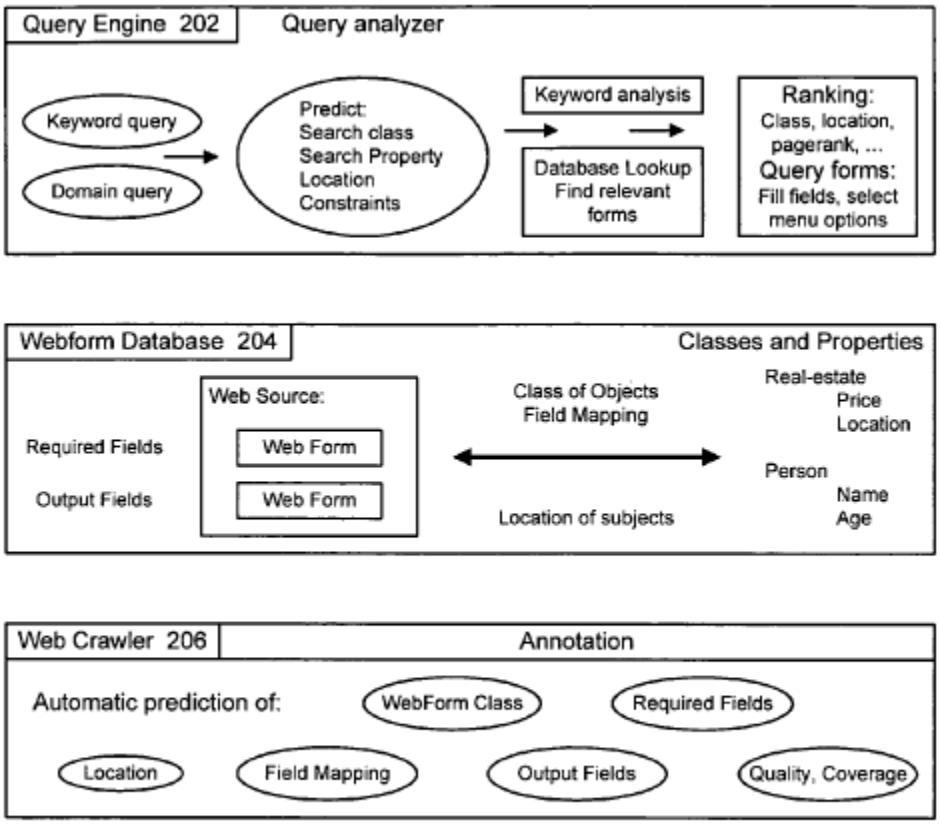


FIG. 2

Figure 2 provides an overview of form engine 106 that includes a set of tools such as query engine 202; web-form database 204; and web crawler 206 (which includes form analyzer). *Id.* ¶ 37. In operation, "web crawler 206 first obtains web-based forms of interest, and stores corresponding form-related information for the web-based forms of interest in web-form database 204." *Id.* "[Q]uery engine 202 accesses this form-related information from web-form database 204 to facilitate subsequent searching operations through content which is accessible through the web-based forms." *Id.*

Halevy further discloses that the database describes web sources via a search ontology (SO) of classes and properties – SO-classes and SO-

properties. *Id.* ¶ 38. Each such webpage (interchangeably termed a webpage, data source, and web source) is identified by its URL and its description indicates the class of the source (e.g., university), a geographic location, and a page rank. *Id.* ¶ 39. And, the captured information for each form of the page includes the fields (e.g., parameter names), class (e.g., books), a geographic location, required fields, the output SO-properties, a schema-mapping between the fields and corresponded SO-properties, and other descriptive keywords. *Id.* ¶¶ 39–49.

Figure 3 is reproduced below:

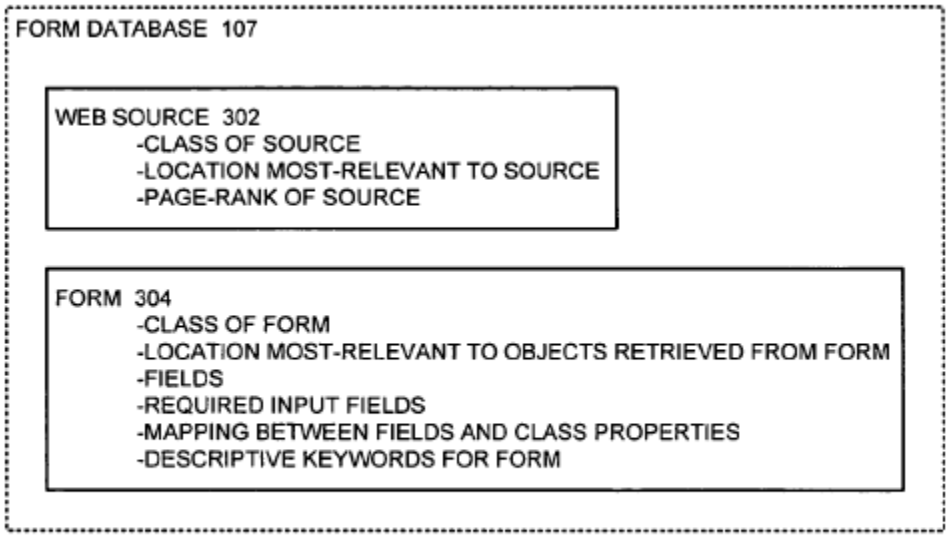


FIG. 3

Ex. 1006, Fig. 3. Figure 3 illustrates entries contained in a form database. Halevy discloses that the form database may capture information such as:

> 1. Fields in the form--For each field the information recorded can include its parameter name (used to invoke some server-side script), the human-readable or visible text for that field, field types (text, select box, radio button, or checkbox), and exemplary values for the field (e.g., the options in a select box).

> 2. The class of the form--This information specifies the types of objects that can be obtained by querying the form. For example, books, hotels, restaurants. Note that a source can have several forms on it, and they can relate to different classes of objects (e.g., newspapers often have forms for looking for houses, jobs and cars for sale).
>
> 3. Geographic location--This information specifies a geographic location which is specific to the objects retrieved using the form.
>
> 4. Required fields--These are field which are required to submit the form. In some cases, there are multiple combinations of fields that can satisfy the requirements.
>
> 5. Output properties--This specifies the type of information we will obtain from answers to a successful form submission.
>
> 6. Schema mapping--This is the mapping between the fields in the form and the SO-properties.
>
> 7. Additional keywords--These are additional keywords that describe the web form.

Id. ¶¶ 43–50.

Halevy further teaches that the overall process of searching through content accessible through web-based forms (*id.* ¶¶ 136–139; Fig. 6) includes the following steps seriatim. A query of keywords is first received. *Id.* ¶ 136. A SO-class for the query is predicted based on the keywords. *Id.* A structured query is constructed by mapping the keywords to SO-properties of the predicted SO-class. *Id.* Based on the structured query, a "lookup" of the form database identifies forms of interest and ranks these forms. *Id.* ¶ 137. The user is presented "query-through links" to the ranked forms of interest and the user clicks on a link to submit a query to a form of interest and thereby query the content accessible via the form. *Id.* ¶ 138. Or, if the lookup returns a form containing content pre-extracted during the crawling process, the system can optionally search through the

pre-extracted content instead querying to the form to obtain the content. *Id.* ¶ 139.

3. Haveliwala (Ex. 1019)

Haveliwala is a U.S. patent titled "[s]ystem and method for modulating search relevancy using pointer activity monitoring." *Id.* at code (54). Haveliwala "relates generally to the field of search engines, and in particular, to a system and method of modulating a search result relevancy with user feedback." *Id.* at 1:11–13. Haveliwala discloses a user response analysis unit that receives and analyzes "user browsing activities[,]i.e., pointer activity, such as placement and movement." *Id.* at 3:14–17. As an example, this analysis may factor that a "longer pointer hover period" suggests greater relevance of the item to the user. *Id.* at 4:16–19. Additionally, Haveliwala discloses a relevancy value update unit that updates an item's relevancy value based on information received from the user response analysis unit. *Id.* at 3:17–20. Per the updated relevancy values, the same item is newly ranked for relevance from one query to the next. *Id.* at 3:20–24.

B. Ground 1: Claims 1–6, 9–16, 19–24, and 26 as Obvious over Belanger and Halevy

Petitioner contends that Belanger and Halevy teach or suggest every limitation of claims 1–6, 9–16, 19—24, and 26. Pet. 41–73.

1. Analysis of Independent Claim 1

Petitioner contends that a combination of Belanger and Halevy teaches or suggests every limitation of claim 1. Pet. 41–60. Patent Owner disagrees. Prelim. Resp. 16–30 (addressing limitations 1C, 1D, and 1I), 30–32 (addressing motivation to combine).

a) [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, ...

(1) Petitioner's Contentions

For limitation [1C(i)], Petitioner contends that Halevy's form engine executes a crawling process that categorizes webpages and forms "'schema' (i.e., a model/structure) consisting of a 'search ontology' (SO) of 'classes and properties.'" Pet 46 (citing Ex. 1006 ¶ 38; Ex. 1013, 1). Petitioner asserts that SO-classes are identified for each form and then used to map the fields in the form (e.g., "computer-readable field identifiers") to one another using "SO-properties." *Id.* (citing Ex. 1006 ¶¶ 39–41, 45, 49, 62, 67; Ex. 1003 ¶ 104) (emphasis omitted). Petitioner also provides an annotated version of Halevy's Figure 3.

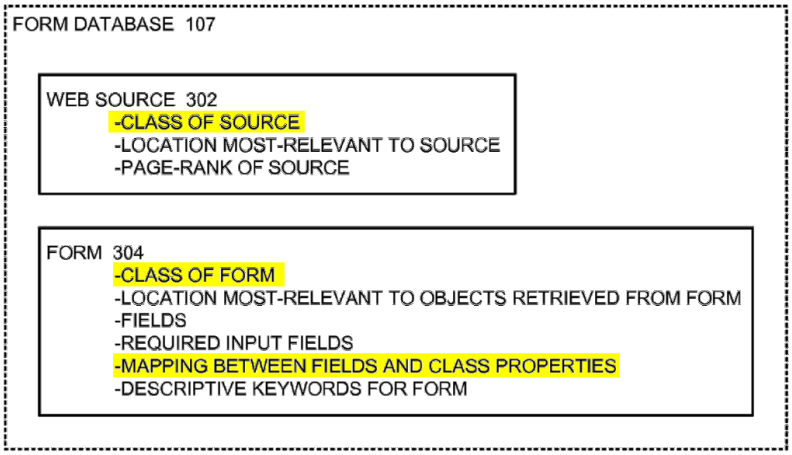


FIG. 3

Annotated Figure 3 on page 47 of the Petition includes highlighted text "Class of Source," "Class of Form," and "Mapping Between Fields and Class Properties." *Id.* at 47. Petitioner maintains that "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." *Id.* (citing Ex. 1006 ¶¶ 35, 37, 67, 95, Fig. 2; Ex. 1003 ¶ 105). Petitioner contends

> Halevy's crawling process maps the fields of various [web] forms to a set of SO-properties associated with the form's [identified] 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.

Id. at 47–48 (emphasis omitted). As an example, Petitioner contends that

> 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.

Id. at 47 (citing Ex. 1006 ¶¶ 95, 98–101; Ex. 1003 ¶ 105) (emphasis omitted).

(2) Patent Owner's Contentions

Patent Owner contends Petitioner inconsistently addresses the claimed field identifiers by asserting Halevy's parameter names of the form fields teach the claimed field identifiers for limitation [1A] and then asserting the fields themselves teach the claimed field identifiers for limitation [1C(i)]. Prelim. Resp. 18–19. Patent Owner further asserts Petitioner fails to show either of Halevy's parameter names of the fields or fields themselves are mapped between any forms of Halevy's form database. *Id.* at 18–19. In addition, Patent Owner contends Petitioner fails to address the further requirement that there is a mapping of the field identifiers "using a set of

normalized variables stored in a normalized variable data database." *Id.* at 21–26.

(3) Discussion

We observe first that "[Halevy's] first step in processing a web source is to locate the forms in the source and to extract the text corresponding to the fields in the form." Ex. 1006 ¶ 53. According to Halevy, the "web source is subsequently classified into the ontology classes." *Id.* ¶ 55. Then, the "*forms* on the page are classified into the classes in the ontology." *Id.* ¶ 57 (emphasis added). Halevy explains that this classification is used to predict what kinds of objects are in the databases queried by the form. *Id.* For "Schema Matching," Halevy discloses "a mapping between the fields in the form and the SO-properties of the SO-classes[.]" *Id.* ¶¶ 61–62.

Missing, however, from Halevy's disclosure is any teaching or suggestion that a "plurality of computer-readable field identifiers" are mapped "to one another" as required by claim 1.

Petitioner's declarant, Dr. Fox, testifies that "[t]he '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 . . . in annotated Figure 3." Ex. 1003 ¶ 104 (citing Ex. 1006 ¶¶ 39–40, 45, 49, 62, 67). Yet, those cited portions of Halevy do not support Dr. Fox's testimony.

As Patent Owner's declarant, Dr. Sam Malek, explains:

> the language highlighted by Petitioner in Figure 3 does ***not*** actually show that "[t]he 'SO-classes' are . . . used to map the fields in the form . . . to one another using 'SO-properties,'" as he contends. *Id.* Rather, the language in Figure 3 that Dr. Fox has highlighted merely shows that, for any given form, there is "mapping between fields" of ***that*** form and "class properties."

> EX1006, Fig. 3. In other words, *fields in a form are mapped to class properties*. Figure 3 does not show any mapping of fields ***to each other***, as Dr. Fox argues.

Ex. 2001 ¶ 69 (citing Ex. 1006, Fig. 3) (emphasis added). Dr. Malek further reasons that "[t]he mere fact that fields in forms for different websites might have the same SO-properties does not mean that the SO-properties are performing any 'mapping' between field identifiers of different websites or applications." *Id.* ¶ 71.

To better explain this point, Dr. Malek refers to Halevy's Figure 6, which reproduced below.

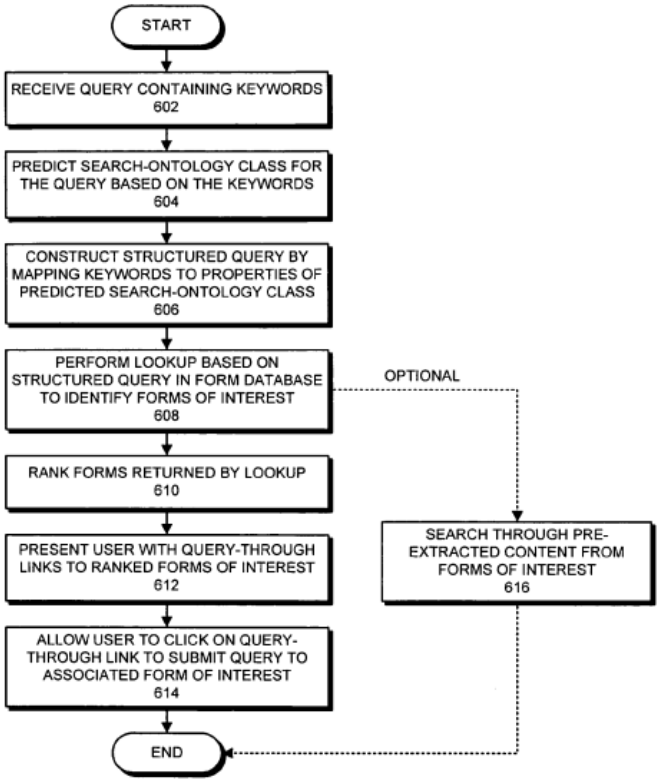


FIG. 6

Figure 6 is a flow chart depicting the process of searching through content which is accessible through web-based forms. Ex. 1006 ¶ 31. As shown, a query of keywords is received (step 602), then a SO-class is predicted based

on the keywords (step 604). *Id.* ¶ 136. A structured query is then constructed by mapping the keywords to SO-properties of the predicted SO-class (step 606). *Id.* Based on the structured query, a "lookup" of the form database identifies forms of interest and ranks these forms (steps 608, 610) to present as "query-through links" to the user. *Id.* ¶¶ 137–138. The user clicks on a link to submit a query to a form of interest and thereby query the content accessible via the form (steps 612, 614). *Id.* ¶ 138.

Dr. Malek refers to steps 606, 608 that show the mapping of keywords to properties of a predicted SO class and the lookup of forms of interest through a structured query in the form database. Ex. 2001 ¶ 71. Dr. Malek explains that "Halevy does not teach that the SO-properties establish any relationship between different websites or applications. Rather, the SO-properties are simply used by Halevy's search engine to identify forms relevant to the user's keyword search[.]" *Id.*

We note further that Halevy discloses:

> *given a new web page, a web-page classifier can used [be] to predict the SO-class for the source*. Next, a web-form classifier can be used to identify the *top candidate SO-classes for each web form on the web page*. Then, for each web form and given candidate SO-class, *the form-field-to-SO-property matcher can be invoked to compute similarities between the fields on the web form and the properties of the search class*. A constraint satisfaction module can then be invoked to pick the particular *field-to-SO-property matches*.

Ex. 1006 ¶ 67 (emphases added). Again, Halevy discloses that a web-page classifier, when used, can predict the SO-class and then a *form-field-to-SO-property matcher* can compute similarities between the fields on the web form and *the properties of the search class*. *Id.* This is done to "pick the

particular *field-to-SO property matches*," but does not disclose mapping computer-readable field identifiers to one another. *Id.*

Next, turning to paragraphs 95 and 98–101, Halevy discloses further that "property recognizers are employed to identify interesting constants in user queries . . . [and] SO-classes can be predicted based on the properties recognized." Ex. 1006 ¶ 95. Halevy indicates that various recognizers may be employed, including:

> 1. a search-class recognizer which recognizes a word or a sequence of words representing the name of a class, a part of the name of the class or a synonym (synonyms are looked up from a pre-defined list of words associated with each class);
>
> 2. a property-name recognizer which recognizes a word representing the name of some property in the ontology;
>
> 3. a first-and-last-name recognizer which recognizes a common last name or first name (the score in this case is a measure of the frequency of the name as per the U.S. Census);
>
> 4. a location recognizer which recognizes the word or sequence of words representing a location name, i.e., city, state, or country name, or a valid U.S. ZIP code.
>
> 5. a generic-property recognizer which recognizes is the word representing a known example of a property, i.e., is there a known mapping from some web form field to the property by which it can be reasoned that the word is an example of the property (For example, "Acura" is a car make, since it appears as one of the options in a select box for car makes in a used car search web form. This recognizer can reuse the property mappings predicted by the schema matcher); or
>
> 6. a year recognizer which recognizes a year between 1900 and 2010.

Ex. 1006 ¶¶ 96–102. Halevy contemplates that recognizers may be used and property mappings may be reused (*see id.* ¶ 101), but Halevy does not disclose that fields are mapped *to one another* via property mappings.

We find Halevy's disclosures are consistent with Patent Owner's arguments and Dr. Malek's testimony that Halevy does not teach mapping fields to one another or mapping of fields to one another through SO-properties. For example, as described, in Figure 6 and Halevy as a whole, Halevy does not teach or suggest mapping or linking different keywords to one another, rather the keywords are mapped to SO-properties. *See* Ex. 1006, Figs. 3, 6.

For at least these reasons, Petitioner has not supported adequately or explained persuasively how the combination of Belanger and Halevy disclose this limitation recited in claim 1.

> *b) [1C(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;"*

(1) Petitioner's Contentions

Petitioner contends that POSITAs would have recognized Halevy's form database to be a "normalized variable data database" that stores a mapping of SO-properties (i.e., "normalized variables") associated with SO-classes to fields (i.e., "computer-readable field identifiers") found on various website forms (i.e., "plurality of sites or applications [on the Internet]") analyzed by the crawling process. *Id.* at 48 (citing Ex. 1006 ¶¶ 43–49, 67; Ex. 1003 ¶ 107) (emphasis omitted). Petitioner adds that

> Halevy's form database is a "universal variable map" that "link[s] computer-readable field identifiers of the plurality of sites or applications [on the Internet]" because form fields (including parameter names) from multiple different websites are linked to each other in the form database by being mapped to the same SO-properties associated with an SO-class.

Id. at 49 (citing Ex. 1003 ¶ 108) (emphasis omitted).

For Petitioner's proposed combination, Petitioner contends that Belanger's "application server" 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." Pet. 49 (citing Ex. 1008 ¶¶ 106–107; Ex. 1006, Abstract, ¶¶ 137–138; Ex. 1003 ¶ 109). Petitioner adds that a query submitted to Halevy's form database (e.g., 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. *Id.* (citing Ex. 1006 ¶¶ 89, 136–138; Ex. 1003 ¶ 109). In its Reply, Petitioner asserts "Halevy's 'form database' meets the claimed universal variable map because it is a database *that links variables from different websites to each other*" in the same manner described and claimed in the '378 patent. Reply 1 (emphasis in original omitted and emphasis added).

(2) Patent Owner's Contentions

Patent Owner contends limitation [1C(ii)] "reinforces that the required mapping in the normalized variable data database must provide 'linking' between field identifiers of a [multiple] 'plurality of sites or applications [on the Internet].'" Prelim. Resp. 26. Patent Owner asserts Petitioner unreasonably "argues that 'Halevy's form database is a 'universal variable map' that provides the necessary linking 'because form fields (including parameter names) from [multiple] different websites are linked to each other in the form database by being mapped to the same SO-properties associated with an SO-class.'" *Id.* (quoting Pet. 49). Patent Owner adds that "Petitioner's argument for why Halevy purportedly teaches the required 'linking' hinges entirely on its assertion that '[d]ifferently-named fields on

different sites can map to the same SO-properties.'" Sur-Reply 2 (quoting Reply 2). Patent Owner asserts that

> the universal variable map does more than just "relate common variables across forms or websites." As described in the '378 specification, *the universal variable map provides the ability to correlate and automatically transfer user parameters inputted in fields at a first site to corresponding fields of a second site.* POPR, 4–6. This requires more than just "relating common variables across forms or websites." Indeed, if that were all that a universal variable map did, it would be no different than a traditional search engine, which the '342 specification distinguishes as prior art. *See* EX1001, 2:21–26.

Sur-Reply 2–3 (emphases added).

(3) Discussion

As discussed with regard to claim limitation [1C(i)], Petitioner has not supported adequately or explained sufficiently how the association of different fields with the same SO-property in Halevy *maps* those fields to one another. Likewise, we are not persuaded by Petitioner's assertions that associating fields to a SO-property *links* the field identifiers to each other across different websites. Halevy teaches that fields in different forms are mapped to SO-properties (*see* Ex. 1006 ¶ 62, Fig. 3), not to each other. Petitioner urges that mapping the fields to SO-properties is the same as mapping and *linking* fields identifiers to one another. *See* Pet. 48–49. As discussed, however, Halevy does not teach or suggest – mapping and linking fields (or field identifiers) to one another across different websites via a universal variable map/normalized variables.

Dr. Fox states that "Halevy's disclosure of a form database in which corresponding fields from different forms on different websites map to the same SO-properties would have been recognized by a POSA as what the

'378 patent refers to as a *universal variable map*." Ex. 1003 ¶ 108 (citing Ex. 1001, 17:42–46). Based on this conclusory opinion, Dr. Fox reasons that Halevy's form database is a "universal variable map" that must also *link* computer-readable field identifiers (including parameter names) from multiple different websites to each other in the form database, because the field identifiers are mapped to the same SO-properties associated with an SO-class. *Id.*

We observe first that Dr. Fox's conclusion is not supported by the cited portions of the '378 patent. In column 17, lines 42–46, the '378 patent explains that fields or variables may be part of forms and variations of these data fields or variables "may include a source form, a destination form, a single source to many destination form, many sources to one destination form, cascading forms (e.g., a first form links to a second form which links to a third form, etc.) and so on." Ex. 1001, 17:42–46. While this portion of the '378 patent indicates that forms may include variations on fields or variables, it does not describe any linking or mapping of variables to one another. Ex. 2001 ¶ 76 ("[T]hat portion of the specification does not have anything to do with the definition of a "universal variable map." Rather, it merely discusses different types of variables and fields that might appear in different types of forms.").

Moreover, the '378 patent discloses that "[t]o make deep-linked ads work, dynamic data from the publisher's site or app needs to be input into the appropriate locations on the advertiser's site or app, enabling it to 'fast-forward' the user click deep into its conversion funnel." Ex. 1001, 2:64–67. The '378 patent further explains

> these deep-linked ad connections have been *manually created by developing programmatic integrations between variables and*

> *fields on the publisher web site and the advertiser web site, created by manual code*. This is so because each web site uses its own field descriptors and variable names, and the only way to create deep-linked ads has been to manually obtain the names of the respective variables from both publishers and advertisers and then integrate them to each other through manual programming.

Ex. 1001, 3:6–15 (emphases added). In lieu of the manual code, the '378 patent describes automatic generation of deep-links, for example, by normalizing "all the variables and identifiers to a meta-schema constructed for each vertical and type of site or app, whereby all variables and identifiers are mapped to their standard normalized names" and creating "mini-integrations or handshakes between each gathered variable and the corresponding normalized variable by employing a series of mapping heuristics that can be fine-tuned over time." *Id.* at 4:24–31; *see also id.* at Fig. 5 ("Heuristics and Tuning Engine 540"). The detailed description in the '378 patent regarding the mapping and linking of variables contradicts Dr. Fox's testimony that the mere disclosure of a form database in Halevy is the same as the universal variable map described and claimed in the '378 patent.

In addition, we note that Belanger also describes the creation of promotional links as a manual process that requires the setup of parameters by an account or promotion administrator who controls a plurality of settings of pages through GUI 700 shown in Figure 73. *See* Ex. 1008 ¶¶ 209–210. This disclosure is consistent with Dr. Malek's testimony that at the time of the '378 invention, "the only way to create deep-linked ads has been to manually obtain the names of the respective variables from both publishers and advertisers and then integrate them to each other through manual programming." Ex. 2001 ¶ 39. Consistent with both Belanger, the '378 patent disclosure, and Dr. Malek's testimony, we agree with Patent Owner

that claim 1 requires more than "relating common variables across forms or websites" (*see* Sur-Reply 2) because even with manual coding, variables or parameters had to be set up and integrated across websites. *See* Ex. 1008 ¶¶ 209–210.

For these additional reasons, Petitioner has not supported adequately or explained persuasively how the combination of Belanger and Halevy disclose this limitation recited in claim 1.

c) Conclusion

After considering the Petition, the Preliminary Response, Reply, Sur-Reply, and accompanying exhibits and testimony, we determine that Petitioner has not established a reasonable likelihood it would prevail in showing that claim 1 of the '378 patent would have been unpatentable over the asserted combination of Belanger and Halevy.

2. Analysis of Independent Claims 13 and 23

For the challenges of the remaining independent claims 13 and 23, Petitioner principally relies on the same arguments presented for independent claim 1. Pet. 70–73. Patent Owner disputes Petitioner's challenges for the same reasons addressed above for claim 1. Prelim. Resp. 16–28; *see e.g.*, *id.* at 28 ("with respect to . . . elements [1C], [13E], and [23C]").

For the reasons discussed above, Petitioner has not established a reasonable likelihood it would prevail in showing that claims 13 and 23 of the '378 patent would have been unpatentable over the asserted combination of Belanger and Halevy.

3. Dependent claims 2–6, 9–12, 14–16, 19–22, 24, and 26

Petitioner contends that the combination of Belanger and Halevy renders obvious dependent claims 2–6, 9–12, 14–16, 19–22, 24, and 26. Pet. 61–70, 72–73. Patent Owner does not specifically address the challenged dependent claims apart from the arguments presented for the independent claims discussed above. *See generally*, Prelim Resp.; *see generally*, Prelim. Sur-Reply.

For the reasons discussed above for claims 1, 13, and 23, we determine Petitioner has not established a reasonable likelihood that it would prevail in showing that claims 2–6, 9–12, 14–16, 19–22, 24, and 26 are rendered obvious by Belanger in combination with Halevy. Pet. 52–61.

C. Ground 2: Claims 1–6, 9–16, 19–24, and 26 as Obvious over Belanger, APA, and Halevy

Petitioner contends that a combination of Belanger and Halevy teaches or suggests every limitation of the independent claims but alternatively, "[t]o 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." Pet. 73.

Patent Owner argues that "[w]hether a POSITA would know that travel websites can utilize deep-linking advertising is irrelevant to Patent Owner's arguments set forth above for why the combination of Belanger and Halevy does not render the challenged claims obvious." Prelim. Resp. 32.

We note that Petitioner relies on the disclosure of Halevy, not the APA, to teach the claimed features as discussed above for Ground 1. *See* Pet. 73–74 (emphasis omitted) ("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.").

For the reasons discussed above for Ground 1, particularly with regard to the disclosures of Halevy, we determine Petitioner has not established a reasonable likelihood that it would prevail in showing that claims 1–6, 9–12–16, 19–24, and 26 are rendered obvious by Belanger, APA, in combination with Halevy.

D. Ground 3: Claims 7, 8, 17, 18, and 25 as Obvious over Belanger, Halevy, and Haveliwala

Petitioner relies on Haveliwala for the additional limitations recited in dependent claims 7, 8, 17, 18, and 25. Pet. 78.

Patent Owner contends a "POSITA would not have been motivated to combine Haveliwala with Belanger" because "Haveliwala is directed to an improvement in search engine technology, which is very different from Belanger's focus on improving the user experience with the booking process for a car rental website." Prelim. Resp. 33–34 (citing Ex. 1019, 1:10–12; Ex. 2001 ¶ 90).

Claims 7, 8, 17, 18, and 25 depend from claims 1, 13, and 23. For the reasons discussed above for claims 1, 13, and 23, Petitioner has not established a reasonable likelihood it would prevail in showing that dependent claims 7, 8, 17, 18, and 25 are unpatentable.

E. Ground 4: Claims 7, 8, 17, 18, and 25 as Obvious over Belanger, Halevy, and Haveliwala

Petitioner contends:

> 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 . . . and the analysis of Belanger/Halevy in view of Haveliwala as set forth in Ground 3 . . . . 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.

Pet. 80.

Patent Owner responds that "[f]or the same reasons discussed above with respect to grounds 1–3, Petitioner's ground 4 also fails." Prelim. Resp. 34 (citing Ex. 2001 ¶ 91).

Claims 7, 8, 17, 18, and 25 depend from claims 1, 13, and 23. For the reasons discussed above for claims 1, 13, and 23, Petitioner has not established a reasonable likelihood it would prevail in showing that dependent claims 7, 8, 17, and 25 are unpatentable.

V. CONCLUSION

After considering the Petition and the Preliminary Response, and accompanying exhibits and testimony, we determine that Petitioner has not demonstrated a reasonable likelihood of success in proving that at least one claim of the '378 patent is unpatentable.

Accordingly, we deny *inter partes* review of claims 1–26 on all grounds presented in the Petition with respect to these claims. 35 U.S.C. § 314(a).

VI. ORDER

It is

ORDERED that the Petition is denied, and no trial is instituted.

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