Exhibit 4

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF VIRGINIA
NORFOLK DIVISION

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)
I/P ENGINE, INC.,   )
)
                 Plaintiff,   )
         v.   )   Civ. Action No. 2:11-cv-512
)
AOL, INC. et al.,   )
)
                 Defendants.   )
_____)

REBUTTAL EXPERT REPORT OF DR. JAIME
CARBONELL REGARDING VALIDITY OF
U.S. PATENT NOS. 6,314,420 and 6,775,664

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I. INTRODUCTION

I, Jaime Carbonell, state the following:

1.   I have been retained by Dickstein Shapiro LLP, counsel for I/P Engine, Inc. ("I/P Engine"), to provide assistance in the above-captioned case, which I understand to be a patent infringement case involving U.S. Patent Nos. 6,314,420 ("the '420 patent") and 6,775,664 ("the '664 patent").

2.   I am a professor in and director of the Language Technologies Institute at Carnegie Mellon University. I am also a professor in the Computer Sciences Department at Carnegie Mellon University.

3.   I have been asked to evaluate in this report whether the prior art references asserted by Defendants and Dr. Ungar anticipate or render obvious the 14 patent claims asserted by I/P Engine.

4.   I was asked to evaluate the following 14 claims:

- U.S. Patent No. 6,314,420, claims 10, 14, 15, 25, 27 and 28;
- U.S. Patent No. 6,775,664, claims 1, 5, 6, 21, 22, 26, 28 and 38.

5.   I expect to testify at trial to the opinions set forth in this report, and the bases for those opinions. In addition, I expect to testify in rebuttal to any other positions taken by the Defendants with regard to validity or related concepts. Moreover, I intend to use demonstrative exhibits at trial based on the matters discussed and evidence referenced in this report to explain to the jury and the Court the opinions and discussions set out in this report.

6.   I reserve the right to revise, amend, or supplement this report and my opinions set forth in this report based on evidence or information, including documents or deposition testimony of Defendants or third parties, which were not available for review at the time I

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drafted this report. I also intend to continue my review of the materials and documents listed in Exhibit 1 attached to this report that may further inform my opinions in this report.

II.   BACKGROUND

7.   My qualifications for forming the opinions set forth in this report are summarized here and explained in more detail in my curriculum vitae, which is attached as Exhibit 1. Exhibit 1 also includes a list of my publications. In the past 5 years I have been an expert witness on a number of litigations, primarily involving intellectual property regarding search engines and information retrieval, e.g., on behalf of the Plaintiff in *Wachtell v. Capital One*, on behalf of the Defendant in *Apple v. Samsung* – which involves search engine technology, on behalf of the Plaintiff in *Hilcorp v. Texaco* – which also involves search engine technology, and on behalf of the Plaintiff in *Personalized User Model v. Google* – which also involves search engine technology.

8.   I graduated from the Massachusetts Institute of Technology in 1975 with bachelor degrees in Physics and Mathematics. I went on to Yale University where I received a Masters Degree in Computer Science in 1976 and a Ph.D. in Computer Science in 1979.

9.   In 1979, I became an Assistant Professor of Computer Science at Carnegie Mellon University. I was subsequently promoted to Associate Professor and then to Full Professor. Since 1995, I have been the Allen Newell Professor of Computer Science at Carnegie Mellon University. Since 1996, I have also been the Director of the Language Technologies Institute, Carnegie Mellon University. As of this year, I am now a "University Professor" at Carnegie Mellon University, which is a lifetime appointment and the top professorship earned at Carnegie Mellon University.

10. I have published over 300 technical and scientific articles, primarily in peer-reviewed journals and conferences in multiple computational fields, including: computer science, computational linguistics, machine learning, data mining, modeling, information retrieval, search engines, computational biology, machine translation, mathematical and statistical foundations, and integrated systems applications. My article "The Use of MMR and Diversity-Based Reranking in Document Ranking and Summarization" published in the ACM SIGIR conference in 1998 has been cited over 1000 times.

11. My research includes computational methods for analyzing text in order to organize it, retrieve it, summarize it, index it, parse it, and translate it. I have researched mathematical, algorithmic and heuristic approaches to analyzing text, ranging from the statistical (machine learning approaches over textual corpus), to the hand-built linguistic/heuristic methods. I am one of the founders of the modern-era Machine Learning, along with Prof. Mitchell and the late Prof. Michalski. In the early 1980's, together we edited the first three books in the area, launched the Journal of Machine Learning, where I served as Editor-in-Chief for 4 years, and organized the first International Conferences on Machine Learning (ICML).

12. I teach courses and seminars in data mining, search engines, electronic commerce, machine learning and aspects of computational biology at Carnegie Mellon University, mostly at the graduate level. I am also engaged in designing distance-learning and learning-by-doing curricula, also at the graduate level. I also advise Ph.D. and M.S. students in their research.

13. I am being compensated at the rate of $450 per hour for my consultation, research and report-writing work on this matter, and $550 per hour for my deposition and trial work on this matter. My fee is not contingent on the outcome of this litigation or upon my reaching any particular conclusions or opinions.

III. MATERIALS CONSIDERED

14. I have reviewed and relied upon the '420 and '664 patents, and their respective prosecution histories, which includes the prior art cited during prosecution.

15. I have reviewed and relied upon the claim constructions for the '420 and '664 patents as set forth in the Memorandum Opinion and Order ("Claim Construction Order") dated June 15, 2012 and Memorandum Order ("Reconsideration Order") dated August 16, 2012.

16. I have considered in whole or in part the documents listed in Exhibit 2 attached hereto, as well as the following documents:

- Report of Defendants' Expert Lyle H. Ungar, Ph.D. Concerning Invalidity of Claims 10, 14, 15, 25, 27, and 28 of U.S. Patent No. 6,314,420 and Claims 1, 5, 6, 21, 22, 26, 28 and 38 of U.S. Patent No. 6,775,664, dated July 25, 2012 ("Ungar Report"), as well as the documents referenced therein;

- Supplemental Report of Defendants' Expert Lyle H. Ungar, Ph.D., Concerning Invalidity of Claims 10, 14, 15, 25, 27, and 28 of U.S. Patent No. 6,314,420 and Claims 1, 5, 6, 21, 22, 26, 28 and 38 of U.S. Patent No. 6,775,664, dated August 24, 2012, as well as the documents referenced therein;

- Defendants' Written Discovery Responses regarding the invalidity of the '420 and '664 patents, and the documents cited therein; and

- Other documents as referenced in this report.

17. I have relied on my own background, knowledge and experience relating to the subject matter of the patents-in-suit.

18. I may use any or all of the above-referenced documents, other documents that may be produced during the course of this proceeding, and supplemental charts, models and other representations to support my testimony at trial.

IV.   THE COURT'S CONSTRUCTION

19.   I understand that claim construction is ultimately a matter for the Court to decide and, in fact, the Court has construed certain terms of the claims, as described in the Court's Claim Construction Order and Reconsideration Order. I expressly reserve the right to supplement or modify my opinions and this report based upon any further claim construction, if any, by the Court.

V.   APPLICABLE LEGAL PRINCIPLES

20.   I have been informed of several principles concerning patent validity and invalidity, which I used in arriving at my conclusions.

21.   I understand that a patent is presumed valid. I understand that this presumption is due to the fact that each issued U.S. patent is substantively reviewed by a patent examiner at the U.S. Patent and Trademark Office ("PTO") for novelty and nonobviousness among other bases for patentability. I understand that it is the accused infringer's burden to establish that a reference qualifies as prior art and unless I state otherwise in this report, I have made no determination as to whether Defendants' assertion that a particular reference is prior art is correct. Rather, for the purposes of this report, I explain why the references would not invalidate the patents-in-suit even if they qualified as prior art.

22.   I understand that if a single piece of relevant prior art contains all of the elements of a claim, expressly or inherently, then that claim is invalid as "anticipated" by that piece of prior art.

23.   I further understand that a patent may be found invalid if the differences between the prior art and the invention are such that the invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. I further understand that

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references must be viewed as a whole and that references may teach away from a combination that might otherwise result in the invention claimed.

24.   I further understand that "secondary considerations" may reveal that a patented invention is not obvious, but only if there is a nexus between that invention and the secondary consideration. These secondary considerations include, but are not limited to, (1) whether the invention solves a long-felt need, (2) commercial success of the invention, (3) praise of the invention and (4) failures by others, and other similar considerations. Commercial success of an invention may be measured by the success of either the patentee's or the accused infringer's products.

25.   I am informed that the combination of familiar elements according to known methods is not obvious if the invention yields unpredictable results. I am further informed that a corollary principle is that when the prior art teaches away from combining certain known elements, a claim directed to a discovery of a successful means of combining them is more likely to be non-obvious.

26.   I understand that a claim composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. I understand that it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.

VI.   LEVEL OF ORDINARY SKILL IN THE ART

27.   I have read the '420 and '664 patents from the perspective of a person of ordinary skill in the art (POSITA), which means the level of skill of a POSITA at the time of the filing of each patent (or the effective filing date of the applications that led to each of the patents). It is

my opinion that a POSITA in the art of which the '420 and '664 patents are a part of would have a bachelor's degree in a field related to computer science, and two or three years of work experience in information systems.

VII. RESPONSE TO DR. UNGAR'S OVERVIEW OF THE ASSERTED PATENTS SECTION

28.   In his report, Dr. Ungar expends considerable space summarizing technological concepts that he believes are relevant to, or taught by, the '420 and '664 patents. Discussion of relevant points to which I disagree is contained below in my discussion of Defendants and Dr. Ungar's anticipation and obviousness allegations.

VIII. SUMMARY OF OPINIONS IN THIS REPORT

29.   It is my opinion that Rose does not anticipate claims 1, 6, 21, 22, 26, 28 and 38 of the '664 patent.

30.   It is my opinion that Lashkari does not anticipate claims 10 and 25 of the '420 patent.

31.   It is my opinion that Lashkari does not anticipate claims 1, 6, 21, 22, 26, 28 and 38 of the '664 patent.

32.   It is my opinion that Bowman does not anticipate claims 10, 14, 15, 25, 27 and 28 of the '420 patent.

33.   It is my opinion that Bowman does not anticipate claims 1, 5, 6, 21, 22, 26, 28 and 38 of the '664 patent.

34.   It is my opinion that Culliss does not anticipate claims 10, 14, 15, 25, 27 and 28 of the '420 patent.

35.   It is my opinion that Culliss does not anticipate claims 1, 5, 6, 21, 22, 26, 28 and 38 of the '664 patent.

36.   It is my opinion that Ryan does not anticipate claims 10, 14, 15, 25, 27 and 28 of the '420 patent.

37.   It is my opinion that Ryan does not anticipate claims 1, 5, 6, 26, 28 and 38 of the '664 patent.

38.   It is my opinion that the combination of Rose in view of Bowman does not render obvious claims 10, 14, 15, 25, 27 and 28 of the '420 patent.

39.   It is my opinion that the combination of Rose in view of Bowman does not render obvious claim 5 of the '664 patent.

40.   It is my opinion that the combination of Lashkari in view of Bowman does not render obvious claims 14, 15, 27 and 28 of the '420 patent.

41.   It is my opinion that the combination of Lashkari in view of Bowman does not render obvious claim 5 of the '664 patent.

42.   It is my opinion that the combination of Ryan in view of Rose does not render obvious claims 21 and 22 of the '664 patent.

43.   None of the prior art references relied upon by Defendants and Dr. Ungar disclose, teach or suggest "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query" of claims 10 and 25 of the '420 patent, "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user" of claim 1 of the 664 patent, or "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined

information for relevance to at least one of the query and the first user" of claim 26 of the '664 patent.

44.   Because of this, the prior art references relied upon by Defendants and Dr. Ungar fail to anticipate or render obvious the asserted claims.

45.   Dr. Ungar attaches seven claim charts.[1] Exhibits A-2 (directed to Herz) and A-4 (directed to Balabanovic) are not relied upon in the anticipation section of Dr. Ungar's report. Nonetheless, it is my opinion that those two prior references do not anticipate or render obvious any of the asserted claims in the '420 or '664 patents. Herz and Balabanovic fail to disclose at least "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query" of claims 10 and 25 of the '420 patent, "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user" of claim 1 of the 664 patent, and "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user" of claim 26 of the '664 patent. I reserve the right to share and elaborate on my opinions if Dr. Ungar asserts that the Herz and Balabanovic references invalidate the asserted claims of the '420 and/or '664 patents.

46.   Exhibit A-1 (directed to Rose) includes a chart with respect to the asserted claims of the '420 patent but is not relied upon in the anticipation section of Dr. Ungar's report. Even so, it is my opinion that Rose does not anticipate or render obvious the asserted claims of the '420 patent. Rose fails to disclose all limitations of the '420 patent for similar reasons that it

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[1] To the extent that Dr. Ungar's report and the accompanying claim charts include different, or in some aspects conflicting, citations for the same limitations, I have considered them all and conclude that the prior art references do not anticipate or render obvious the asserted claims of the '420 and '664 patents.

fails to disclose all limitations of the '664 patent, and Rose fails to disclose at least "filtering the informons on the basis of applicable content profile data for relevance to the query" and "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query" of claims 10 and 25 of the '420 patent. I reserve the right to share and elaborate on my opinions if Dr. Ungar asserts that the Rose reference invalidates the asserted claims of the '420 patent.

IX.   U.S. PATENT NO. 6,202,058 TO ROSE ("ROSE") DOES NOT INVALIDATE THE PATENTS-IN-SUIT

47.   Dr. Ungar does not assert that any of the claims of the '420 patent are anticipated by Rose. Defendants and Dr. Ungar assert that Rose anticipates claims 1, 6, 21, 22, 26, 28 and 38 of the '664 patent. I disagree.

48.   With respect to claims 1, 6, 21, 22, 26, 28 and 38 of the '664 patent, Rose does not disclose:

- "searching for information relevant to a query associated with a first user";

- "receiving information found to be relevant to the query by other users"; and

- "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user" or "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user."

49.   Because Rose does not disclose all of the limitations of claims 1 and 26 of the '664 patent, Rose cannot disclose all of the limitations recited by claims 6, 21, 22, 28 and 38 of the '664 patent.

50.   First, Rose does not disclose "searching for information relevant to a query associated with a first user." Dr. Ungar, in paragraph 207, states that Rose meets this element

based on the disclosure in column 2, lines 54-55 and claim 26. This portion of Rose simply refers to processing the results of an external on-line text retrieval service. See Rose at 2:51-55. Rose does not disclose that this service receives queries from users, or that it obtains information in response to user queries.

51.   Second, Rose does not disclose "receiving information found to be relevant to the query by other users." In fact, Dr. Ungar admits in paragraph 209 that Rose does not disclose "receiving . . . information that other users deemed relevant to a particular query," and I agree. The feedback described in Rose is an indication of interest in each document retrieved from the system, and is not information that is relevant "to the query." *See e.g.*, Rose at 2:46-50.

52.   Dr. Ungar takes the position in the alternative (an obviousness argument) that modifying Rose (in view of Bowman) "to record feedback from a subset of users that had entered the same search query would be a simple and obvious modification to make." I disagree. Rose and Bowman disclose different systems for handling feedback. Bowman is based on term-item correlation tables. Bowman at FIGS. 3, 4 and 6. In contrast, Rose discloses user-user correlations and item-item correlations. It would not have been "simple or obvious" for a person of ordinary skill in the art to incorporate Bowman's term-item correlation into Rose's system relying on user-user correlations or item-item correlations because it would require a fundamental reengineering of the system architecture and feedback strategy. There is no reason that would be apparent to a person of skill in the art to undertake such a modification. Moreover, it is my opinion that a person of ordinary skill in the art would not have been able to successfully combine the teachings of Rose and Bowman in the manner contemplated by Dr. Ungar.

53.   Third, Rose does not disclose "combining the information from the feedback system with the information from the scanning system" or "combining the information found to be relevant to the query by other users with the searched information." As described above, Rose does not disclose the two items of information required by the claim limitations (i.e., the information from the scanning system"/"searched information" and the "information from the feedback system"/"information found to be relevant to the query by other users"), and thus it does not disclose combining those two items of information. Moreover, Rose does not disclose "filtering the combined information" because Rose uses its user profile information and feedback about the indications of interest to rank items, not filter them. *See e.g.*, Rose at 4:35-44; 6:56-58. Ranking is different than filtering, which is an item-by-item process that considers each item for exclusion.

54.   With respect to claim 6, although Dr. Ungar states that Rose anticipates claim 6 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 6 depends, claim 6 is not anticipated by Rose. Moreover, the portions of Rose relied upon by Dr. Ungar fail to cure the shortcomings of Rose that I described above. *See* Rose, Abstract.

55.   With respect to claim 21, although Dr. Ungar states that Rose anticipates claim 21 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 21 depends, claim 21 is not anticipated by Rose. As already noted, Rose also does not disclose filtering, as required by claim 21. Moreover, the portions of Rose relied upon by Dr. Ungar fail to cure the shortcomings of Rose that I described above. *See* Rose 6:10-25.

56.   With respect to claim 22, although Dr. Ungar states that Rose anticipates claim 22 of the '664 patent, I disagree. For the reasons already noted in connection with claim 21, from which claim 22 depends, claim 22 is not anticipated by Rose.

57.   With respect to claim 26, Dr. Ungar states that Rose anticipates claim 26 of the '664 patent for the same reasons that it anticipates claim 1. Thus, for at least the reasons that I have opined with respect to claim 1, claim 26 is not anticipated by Rose.

58.   With respect to claim 28, although Dr. Ungar states that Rose anticipates claim 28 of the '664 patent, I disagree. For the reasons already noted in connection with claim 26, from which claim 28 depends, claim 28 is not anticipated by Rose. As already noted, Rose also does not disclose "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user," and thus cannot deliver the filtered information to the user, as required by claim 28.

59.   With respect to claim 38, although Dr. Ungar states that Rose anticipates claim 38 of the '664 patent, I disagree. For the reasons already noted in connection with claim 26, from which claim 38 depends, and those cited in this paragraph, claim 38 is not anticipated by Rose.

X.   LASHKARI, "FEATURE GUIDED AUTOMATED COLLABORATIVE FILTERING," MIT MASTERS THESIS (SEPTEMBER 1995) ("LASHKARI") DOES NOT INVALIDATE THE PATENTS-IN-SUIT

60.   Defendants and Dr. Ungar assert that Laskkari anticipates claims 10 and 25 of the '420 patent and claims 1, 6, 21, 22, 26, 28 and 38 of the '664 patent. I disagree.

61.   With respect to claims 10 and 25 of the '420 patent, Lashkari does not disclose:

- "filtering the informons on the basis of applicable content profile data for relevance to the query"; and

- "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query".

62.   Lashkari therefore does not disclose all of the limitations of claims 10 and 25 of the '420 patent.

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63.   With respect to claims 1, 6, 21, 22, 26, 28 and 38 of the '664 patent, Lashkari does not disclose:

- "receiving information found to be relevant to the query by other users"; and

- "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user" or "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user" as recited in claims 1 and 26 of the '664 patent, respectively.

64.   Because Lashkari does not disclose all of the limitations of claims 1 and 26 of the '664 patent, Lashkari cannot disclose all of the limitations recited by claims 6, 21, 22, 28 and 38 of the 664 patent.

65.   First, Lashkari does not disclose "filtering the informons on the basis of applicable content profile data for relevance to the query." Dr. Ungar states in paragraph 153 that "WEBHOUND filters these information items 'for relevance to the query' because WEBHOUND may be employed to filter results from a traditional search engine such as LYCOS." Contrary to Dr. Ungar's opinion, the analysis in WEBHOUND is not performed "for relevance to the query." WEBHOUND's filter does not consider or even access a user's query. *See* Lashkari at 78. The Lycos search engine mentioned in Lashkari does not disclose "filtering" because it falls in the category of "information retrieval engines (as opposed to information filtering systems)." *Id.*

66.   Second, Lashkari does not disclose "pertaining feedback data" or "receiving … information that other users deemed relevant to a particular query." The feedback described in Lashkari is not relevant "to the query" and accordingly is not "pertaining" feedback data nor "information . . . deemed relevant to a particular query."

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67.   Dr. Ungar additionally takes the position in footnote 21 that modifying Lashkari's

WEBHOUND system in light of Bowman and Culliss such that "WEBHOUND received

information that other users found relevant to a particular query" would be obvious. I disagree.

Lashkari, Bowman and Culliss disclose distinct systems for handling feedback. Bowman and

Culliss are based on term-item correlation tables and receive binary feedback (whether or not the

user clicks on a document). Bowman at FIGS. 3, 4 and 6 and Culliss 5:20-64. In contrast,

Lashkari discloses user-user correlations and item-item correlations and Lashkari receives

explicit feedback on a 7-point ordinate scale, unrelated to the query.   It would not have been

obvious for a person of ordinary skill in the art to incorporate Bowman or Culliss' term-item

correlation into Lashkari's system relying on user-user correlations or item-item correlations

because it would require a fundamental reengineering of the system architecture and feedback

strategy and because Lashkari is not a search engine. There is no reason that would be apparent

to a person of skill in the art to undertake such a modification.   Moreover, it is my opinion that a

person of ordinary skill in the art would not have been able to successfully combine the teachings

of Bowman/Culliss and Lashkari in the manner contemplated by Dr. Ungar.

68.   Third, Lashkari does not disclose "combining pertaining feedback data . . . with

the content profile data in filtering each informon for relevance to the query." Lashkari does not

disclose using any content analysis from the disclosed search engines in the Lashkari filtering

because the disclosed search engine is external to WEBHOUND.   The Lashkari filtering does

not consider any query, and therefore does not filter "for relevance to the query."

69.   Lashkari also does not disclose "combining the information from the feedback

system with the information from the scanning system and . . . filtering the combined

information for relevance to at least one of the query and the first user" or "combining the

information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user." Lashkari does not disclose using content analysis from the disclosed search engines in the Lashkari filtering because the disclosed search engine is external to WEBHOUND.

70.   With respect to claim 25 of the '420 patent, Dr. Ungar states that Lashkari anticipates claim 25 for the same reasons that it anticipates claim 10 of the '420 patent. Thus, for at least the reasons that I have opined with respect to claim 10, claim 25 is not anticipated by Lashkari.

71.   With respect to claim 6 of the '664 patent, although Dr. Ungar states that Lashkari anticipates claim 6 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 6, depends, claim 6 is not anticipated by Lashkari.

72.   With respect to claim 21 of the '664 patent, although Dr. Ungar states that Lashkari anticipates claim 21 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 21, depends, claim 21 is not anticipated by Lashkari.

73.   With respect to claim 22 of the '664 patent, although Dr. Ungar states that Lashkari anticipates claim 22 of the '664 patent, I disagree. For the reasons already noted in connection with claim 21, from which claim 22 depends, claim 22 is not anticipated by Lashkari.

74.   With respect to claim 26 of the '664 patent, Dr. Ungar states that Lashkari anticipates claim 26 of the '664 patent for the same reasons that it anticipates claim 1 of the '664 patent. Thus, for at least the reasons that I have opined with respect to claim 1, claim 26 is not anticipated by Lashkari.

75.   With respect to claim 28 of the '664 patent, although Dr. Ungar states that

Lashkari anticipates claim 28 of the '664 patent, I disagree. For the reasons already noted in

connection with claim 26, from which claim 28 depends, claim 28 is not anticipated by Lashkari.

76.   With respect to claim 38 of the '664 patent, although Dr. Ungar states that

Lashkari anticipates claim 38 of the '664 patent, I disagree. For the reasons already noted in

connection with claim 26, from which claim 38 depends, claim 38 is not anticipated by Lashkari.

XI.   U.S. PATENT NO. 6,185,558 TO BOWMAN ("BOWMAN") DOES NOT INVALIDATE THE PATENTS-IN-SUIT

77.   Defendants and Dr. Ungar assert that Bowman anticipates claims 10, 14, 15, 25,

27 and 28 of the '420 patent and claims 1, 5, 6, 21, 22, 26, 28 and 38 of the '664 patent. I

disagree.

78.   With respect to claims 10, 14, 15, 25, 27 and 28 of the '420 patent, Bowman does

not disclose:

- "filtering the informons on the basis of applicable content profile data for relevance to the query"; and

- "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query."

79.   Because Bowman does not disclose all of the limitations of claims 10 and 25 of

the '420 patent, Bowman cannot disclose all of the limitations recited by claims 14, 15, 27, and

28 of the '420 patent.

80.   With respect to claims 1, 5, 6, 21, 22, 26, 28 and 38 of the '664 patent, Bowman

does not disclose:

- "searching for information relevant to a query associated with a first user"

- "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least

one of the query and the first user" or "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user" as recited in claims 1 and 26 of the '664 patent, respectively.

81.   Because Bowman does not disclose all of the limitations of claims 1 and 26 of the '664 patent, Bowman cannot disclose all of the limitations recited by claims 5, 6, 21, 22, 28 and 38 of the 664 patent.

82.   First, Bowman does not disclose "filtering the informons on the basis of applicable content profile data for relevance to the query" or "searching for information relevant to a query associated with a first user." Dr. Ungar states in paragraph 57, as part of his general description of Bowman, that "search results whose content contains all the terms in the query get higher ranking scores while search results get progressively lower ranking scores as their content contains fewer and fewer of the terms in the query." I disagree. Bowman discloses ranking items "in accordance with collective and individual user behavior, rather than in accordance with attributes of the items." Bowman 2:63-3:2; 4:38-48.[2]

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[2] Bowman initially establishes a rating table without any entries. *See* FIGS. 3, 4 or 6; 5:48-49. To populate the ranking table with entries, Bowman discloses "the facility identifies all of the query result item selections made by users during the period of time for which rating table is being generated." Bowman 5:49-51. Bowman then "identifies the terms used in the query that produced the query result in which the item selection took place." Bowman 5:60-62. The scores in the rating table are augmented when a user clicks on a result by incrementing the score of each term in the query, whether or not that term is actually is contained in the search results. Bowman 6:9-25. Bowman's "facility uses rating tables that it has generated to generate ranking values for items in new query results." Bowman 9:28-29. The facility determines the rating score contained by the most recently generated rating table for the current term and item. Bowman 9:35-39. Bowman's "facility combines the scores for the current item to generate a ranking value for the item. Bowman 9:41-43. To process a new query at run time, Bowman consults the rating table and adds the scores for each terms associated with the item in the query, ranking the items by their ranking scores. Bowman 9:48-49. Bowman also discloses that "scores may be adjusted to more directly reflect the number of query terms that are matched by the item." Bowman 9:50-53.

83.   Dr. Ungar then relies upon a described example using an example query "Paris museum vacations" to support his point. Dr. Ungar's example, however, presupposes that Bowman has full search engine capabilities in combination with the use of a popularity ranking system when in fact Bowman only discloses the latter. Bowman 2:19-35; 2:63-3:2; 4:38-48.

84.   In paragraph 60 of his report, Dr. Ungar states that "in Bowman, the final ranking score for each item is generated through "a combination [that includes] . . . content-based filtering (analyzing the item's content to see how many of the words from the query appear in the item)." I disagree. As stated above, Bowman does not analyze the items' content, but instead relies on his rating table.[3]

85.   Specifically referencing "filtering the informons on the basis of applicable content profile data for relevance to the query" limitation of claim 10 of the '420 patent, Dr. Ungar states in paragraph 105 that Bowman discloses this limitation because "Bowman examines each search result's content profile to see how many of the query terms are contained therein." He goes on to state that "Bowman adjusts the search results ranking scores by giving higher scores to search results every term in the query." First, Dr. Ungar misquotes Bowman. Bowman states "scores may be adjusted to more directly reflect the number of query terms that are matched by the item, so that the items that match more query terms are favored in the ranking." Bowman 4:34-48. As such, Bowman makes no reference to examining a "search results' content profile" or any

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[3] In paragraph 99 of his report, Dr. Ungar states that "Bowman further adjusts the ranking score of the search results according to how many of the search terms in the query are matched by each search result." It is apparent that, by "matched," Dr. Ungar means that a term of the query is actually found in the document. In my opinion a person of ordinary skill in the art would understand that Bowman uses the word "matched" to indicate that term-item association is contained in Bowman's rating table rather than contained in the item (document). This opinion is fully consistent with Bowman's disclosure of ranking items "in accordance with collective and individual user behavior, rather than in accordance with attributes of the items." Bowman 2:59-3:22; 4:38-48.

content of the search results for that matter. Second, in my opinion a person of ordinary skill in the art would understand that Bowman uses the word "matched" to indicate that term-item association is contained in Bowman's rating table rather than contained in the item (document). This opinion is fully consistent with Bowman's disclosure of ranking items "in accordance with collective and individual user behavior, rather than in accordance with attributes of the items." Bowman 2:59-3:22; 4:38-48.

86. When discussing the "content profile data in filtering each item for relevance to the query" limitation, in paragraph 107, Dr. Ungar misconstrues claim 29 of Bowman in stating that "each search result item's ultimate ranking score in Bowman is determined by combining feedback data . . . with content profile data (showing how many of the query terms appear in that item's content)." In my opinion a person of ordinary skill in the art would understand that Bowman uses the word "matched" in claim 29 to indicate that term-item association is contained in Bowman's rating table rather than contained in the item (document). This opinion is fully consistent with Bowman's disclosure of ranking items "in accordance with collective and individual user behavior, rather than in accordance with attributes of the items." Bowman 2:59-3:22; 4:38-48. In essence, Bowman discloses using two user feedback measures: how important each term is to the item and how many terms in the query were judged important to the item.

87. With respect to the "content-based filter system" limitation of claim 1 of the '664 patent, Dr. Ungar states in paragraph 113 of his report that Bowman discloses "that the search results are combined with feedback information" and cites claim 28[b] and [c] of Bowman. Bowman does not, however, disclose "combining the information from the feedback system with the information from the scanning system" because the combination referred to by Dr. Ungar

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refs to only user feedback from prior users with no reference to item (document) contents or other search engine rankings.

88.   In paragraph 114 of his report, Dr. Ungar further states that Bowman discloses the "'content-based' aspect of this claim element." I again disagree. Dr. Ungar misconstrues Bowman. Bowman discloses that "scores may be adjusted to more directly reflect the number of query terms that are matched by an item." As explained above, in my opinion a person of ordinary skill in the art would understand that Bowman uses the word "matched" to indicate that term-item association is contained in Bowman's rating table rather than contained in the item (document). This opinion is fully consistent with Bowman's disclosure of ranking items "in accordance with collective and individual user behavior, rather than in accordance with attributes of the items." Bowman 2:59-3:22; 4:38-48. Bowman does not refer to the search result's content, or terms appearing in the search result.

89.   Second, because Bowman does not disclose a content-based information component, it does not disclose "combining pertaining feedback data . . . with the content profile data"; "combining the information from the feedback system with the information from the scanning system"; or "combining the information found to be relevant to the query by other users with the searched information."

90.   Third, Bowman does not disclose "filtering each informon on the basis of applicable content profile data for relevance to the query," "filtering each informon for relevance to the query" or "filtering the combined information for relevance to at least one of the query and the first user" because Bowman does not disclose filtering. Dr. Ungar states that "Bowman then filters out (i.e., excludes) search results whose ranking scores fall below a certain threshold, or presents a predetermined number of search results that have the highest ranking scores and filter

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out all the rest." First, filtering is different from "subsetting," the actual technique disclosed in Bowman on which Dr. Ungar relies. "Subsetting" as disclosed in Bowman is retaining a subset of a ranked list either by thresholding on ranking values or retaining the top "N" results. Bowman 9:58-64. These techniques are relative and carried out with reference to the entire ranked list of search results. The use of these techniques is different than filtering, which does not use a ranked list, but rather is an item-by-item process.[4]

91.   Moreover, also for the reasons noted above, Bowman does not disclose filtering. *See* Bowman 9:58-67.

92.   With respect to claims 14 and 15 of the '420 Patent, although Dr. Ungar states that Bowman anticipates claims 14 and 15 of the '420 patent, I disagree. For the reasons already noted in connection with claim 10, from which claims 14 and 15 depend, claims 14 and 15 are not anticipated by Bowman.

93.   With respect to claim 25 of the '420 patent, Dr. Ungar states that Bowman anticipates claim 25 for the same reasons that it anticipates claim 10. Thus, for at least the reasons that I have opined with respect to claim 10, claim 25 is not anticipated by Bowman. With respect to claims 27 and 28 of the '420 Patent, although Dr. Ungar states that Bowman anticipates claim 25 of the '420 patent, I disagree. For the reasons already noted in connection with claim 25, from which claims 27 and 28 depend, claims 27 and 28 are not anticipated by Bowman.

94.   With respect to claim 5 of the '664 patent, although Dr. Ungar states that Bowman anticipates claim 5 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 5 depends, claim 5 is not anticipated by Bowman.

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[4] In footnote 16, Dr. Ungar states that the "content-based filter system" limitation is obvious over Bowman in view of Rose. I address this argument in the obviousness section of my report.

As already noted, Bowman also does not disclose "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user", and thus cannot deliver the filtered information to the user, as required by claim 5.

95.   With respect to claim 6 of the '664 patent, although Dr. Ungar states that Bowman anticipates claim 6 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 6 depends, claim 6 is not anticipated by Bowman.

96.   With respect to claim 21 of the '664 patent, although Dr. Ungar states that Bowman anticipates claim 21 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 21 depends, claim 21 is not anticipated by Bowman. Additionally, Bowman does not disclose "extracting features from the information." Rather, Bowman discloses that "scores may be adjusted to more directly reflect the number of query terms that are matched by an item." Bowman 9:50-53, claim 29; 2:63-3:2; 4:38-48

97.   With respect to claim 22 of the '664 patent, although Dr. Ungar states that Bowman anticipates claim 22 of the '664 patent, I disagree. For the reasons already noted in connection with claim 21, from which claim 22 depends, claim 22 is not anticipated by Bowman.

98.   With respect to claim 26, Dr. Ungar states that Bowman anticipates claim 26 of the '664 patent for the same reasons that it anticipates claim 1. Thus, for at least the reasons that I have opined with respect to claim 1, claim 26 is not anticipated by Bowman.

99.   With respect to claim 28 of the '664 patent, although Dr. Ungar states that Bowman anticipates claim 28 of the '664 patent, I disagree. For the reasons already noted in connection with claim 26, from which claim 28 depends, claim 28 is not anticipated by Bowman. As already noted, Bowman also does not disclose "combining the information found to be

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relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user", and thus cannot deliver the filtered information to the user, as required by claim 28.

100.   With respect to claim 38 of the '664 patent, although Dr. Ungar states that Bowman anticipates claim 38 of the '664 patent, I disagree. For the reasons already noted in connection with claim 26, from which claim 38 depends, claim 38 is not anticipated by Bowman.

XII.   U.S. PATENT NO. 6,006,222 TO CULLISS ("CULLISS") DOES NOT INVALIDATE THE PATENTS-IN-SUIT

101.   Defendants and Dr. Ungar assert that Culliss anticipates claims 10, 14, 15, 25, 27 and 28 of the '420 patent and claims 1, 5, 6, 21, 22, 26, 28 and 38 of the '664 patent. I disagree.

102.   With respect to claims 10, 14, 15, 25, 27 and 28 of the '420 patent, Culliss does not disclose:

- "filtering the informons on the basis of applicable content profile data for relevance to the query"; and

- "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query".

103.   Because Culliss does not disclose all of the limitations of claims 10 and 25 of the '420 patent, Culliss cannot disclose all of the limitations recited by claims 14, 15, 27, and 28 of the '420 patent.

104.   With respect to claims 1, 5, 6, 21, 22, 26, 28 and 38 of the '664 patent, Culliss does not disclose:

- "searching for information relevant to a query associated with a first user"

- "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user" or "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering

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the combined information for relevance to at least one of the query and the first user" as recited in claims 1 and 26 of the '664 patent, respectively.

105.   Because Culliss does not disclose all of the limitations of claims 1 and 26 of the '664 patent, Culliss cannot disclose all of the limitations recited by claims 5, 6, 21, 22, 28 and 38 of the 664 patent.

106.   First, Culliss does not disclose "filtering the informons on the basis of applicable content profile data for relevance to the query"; and "searching for information relevant to a query associated with a first user." In paragraph 63 of his report, Dr. Ungar states that in Culliss, the "Internet articles are associated with key terms that they contain" citing column 3, lines 60-64. Dr. Ungar goes on to state in paragraph 64 of his report that Culliss discloses that the "articles are given a 'key term score' for each of the key terms that they contain." Culliss 3:65-66. These passages referenced by Dr. Ungar, however, refer solely to building the "initial index setting." Culliss 3:65-67. For all intents and purposes, Culliss' rankings are based only on popularity information.[5]

107.   Second, because Culliss does not disclose a content-based information component, it does not disclose "combining pertaining feedback data . . . with the content profile

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[5]   Culliss builds an index, consisting of a table (Culliss at 4:1-9) whose rows are items and whose columns are terms (i.e., key words). Then when a user clicks on a displayed item shown in response to a query, Culliss updates the entries in that table, for instance by adding +1 to each cell corresponding the combination of a clicked item and query term (Culliss at 4:41-49). Culliss also discloses a more elaborate updating mechanism (Culliss at 5:45-6:14) where he records both the hits and displayed articles not clicked on for each term of each query. All updating mechanisms are purely based on popularity of items by multiple users who issued queries containing the terms in the table. Culliss initializes the table prior to initiating the updates based on popularity. The update step is popularity based. Over time, the popularity counts totally dominate the initialization (e.g., if an item was clicked 1000 times when a given terms was in the query, the entry in the table would be 1000 + 1). In essence, the effect of the initialization disappears over time -- it would be 1/10th or 1 percent in the above example -- and diminishing further over time. Hence as the Culliss method is used it becomes for all intents and purposes a popularity-only method.

data"; "combining the information from the feedback system with the information from the scanning system"; or "combining the information found to be relevant to the query by other users with the searched information."

108.   Third, Culliss does not disclose "filtering each informon for relevance to the query" or "filtering the combined information for relevance to at least one of the query and the first user." In paragraph 131 of his report, Dr. Ungar states that "Culliss ranks search results for relevance to a query by calculating their aggregate key term scores for the terms in that query (*id*. at 5:2-10), and each key term score is based on a combination of feedback data and content data Culliss' disclosure of ranking, however, does not disclose filtering." Ranking is different than filtering, which does not use a ranked list, but rather is an item-by-item process that considers each item for exclusion based on its own attributes. Dr. Ungar's example set forth in paragraphs 132-134 of his report does not cure or clarify the deficiencies of paragraph 131. Moreover, the alternative described at column 13, lines 35-49 does not provide sufficient technical details to explain how to combine the two systems and does not disclose filtering.

109.   Dr. Ungar in paragraph 140 states that "ranking a set of search results is sufficient to meet the 'filter' limitation even if no candidate search results are excluded." For the reasons stated in the prior paragraph, I disagree. Filtering is an item-by-item process that considers each item for exclusion.

110.   With respect to claims 14 and 15 of the '420 Patent, although Dr. Ungar states that Culliss anticipates claims 14 and 15 of the '420 patent, I disagree. For the reasons already noted in connection with claim 10, from which claims 14 and 15 depend, claims 14 and 15 are not anticipated by Culliss.

111.   With respect to claim 25 of the '420 patent, Dr. Ungar states that Culliss anticipates claim 25 for the same reasons that it anticipates claim 10. Thus, for at least the reasons that I have opined with respect to claim 10, claim 25 is not anticipated by Culliss. With respect to claims 27 and 28 of the '420 Patent, although Dr. Ungar states that Culliss anticipates claim 25 of the '420 patent, I disagree. For the reasons already noted in connection with claim 25, from which claims 27 and 28 depend, claims 27 and 28 are not anticipated by Culliss.

112.   With respect to claim 5 of the '664 patent, although Dr. Ungar states that Culliss anticipates claim 5 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 5 depends, claim 5 is not anticipated by Culliss.

113.   With respect to claim 6 of the '664 patent, although Dr. Ungar states that Culliss anticipates claim 6 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 6 depends, claim 6 is not anticipated by Culliss.

114.   With respect to claim 21 of the '664 patent, although Dr. Ungar states that Culliss anticipates claim 21 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 21 depends, claim 21 is not anticipated by Culliss.

115.   With respect to claim 22 of the '664 patent, although Dr. Ungar states that Culliss anticipates claim 22 of the '664 patent, I disagree. For the reasons already noted in connection with claim 21, from which claim 22 depends, claim 22 is not anticipated by Culliss.

116.   With respect to claim 26, Dr. Ungar states that Culliss anticipates claim 26 of the '664 patent for the same reasons that it anticipates claim 1. Thus, for at least the reasons that I have opined with respect to claim 1, claim 26 is not anticipated by Culliss.

117.   With respect to claim 28 of the '664 patent, although Dr. Ungar states that Culliss anticipates claim 28 of the '664 patent, I disagree. For the reasons already noted in connection

with claim 26, from which claim 28 depends, claim 28 is not anticipated by Culliss. As already noted, Culliss also does not disclose "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user," and thus cannot deliver the filtered information to the user, as required by claim 28.

118.   With respect to claim 38 of the '664 patent, although Dr. Ungar states that Culliss anticipates claim 38 of the '664 patent, I disagree. For the reasons already noted in connection with claim 26, from which claim 38 depends, claim 38 is not anticipated by Culliss.

119.   I understand that the U.S. Patent and Trademark Office considered the Culliss reference before issuing the '420 and '664 patents.

XIII.   U.S. PATENT NO. 6,421,675 TO RYAN ("RYAN") DOES NOT INVALIDATE THE PATENTS-IN-SUIT

120.   Defendants and Dr. Ungar assert that Ryan anticipates claims 10, 14, 15, 25, 27 and 28 of the '420 patent and claims 1, 5, 6, 26, 28 and 38 of the '664 patent. I disagree.

121.   With respect to claims 10, 14, 15, 25, 27 and 28 of the '420 patent, Ryan does not disclose:

- "filtering the informons . . . for relevance to the query"; and

- "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query".

122.   Because Ryan does not disclose all of the limitations of claims 10 and 25 of the '420 patent, Ryan cannot disclose all of the limitations recited by claims 14, 15, 27, and 28 of the '420 patent.

123.   With respect to claims 1, 5, 6, 26, 28 and 38 of the '664 patent, Ryan does not disclose:

- "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user" or "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user" as recited in claims 1 and 26 of the '664 patent, respectively.

124.   Because Ryan does not disclose all of the limitations of claims 1 and 26 of the '664 patent, Ryan cannot disclose all of the limitations recited by claims 5, 6, 28 and 38 of the 664 patent.

125.   First, Ryan does not disclose "filtering the informons . . . for relevance to the query" or "filtering the combined information for relevance to at least one of the query and the first user." Dr. Ungar, at paragraph 180, states that Ryan filters items because it generates results "in the form of a list, ranked according to criteria specific to the search engine." As explained above, however, ranking is different than filtering, which does not use a ranked list, but rather is an item-by-item process that considers each item for exclusion.

126.   Second, Ryan does not disclose "combining pertaining feedback data . . . with the content profile data in filtering each informon for relevance to the query"; "combining the information from the feedback system with the information from the scanning system"; or "combining the information found to be relevant to the query by other users with the searched information." Ryan's disclosure of "Popularity Search" by itself does not meet these limitations because it does not consider the content of items. Moreover, there is no other disclosure in Ryan where content and feedback data are combined in filtering items.

127.   With respect to claims 14 and 15 of the '420 Patent, although Dr. Ungar states that Ryan anticipates claims 14 and 15 of the '420 patent, I disagree. For the reasons already noted in connection with claim 10, from which claims 14 and 15 depend, claims 14 and 15 are not anticipated by Ryan.

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128.   With respect to claim 25 of the '420 patent, Dr. Ungar states that Ryan anticipates claim 25 for the same reasons that it anticipates claim 10. Thus, for at least the reasons that I have opined with respect to claim 10, claim 25 is not anticipated by Ryan. With respect to claims 27 and 28 of the '420 Patent, although Dr. Ungar states that Ryan anticipates claim 25 of the '420 patent, I disagree. For the reasons already noted in connection with claim 25, from which claims 27 and 28 depend, claims 27 and 28 are not anticipated by Ryan.

129.   With respect to claim 5 of the '664 patent, although Dr. Ungar states that Ryan anticipates claim 5 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 5 depends, claim 5 is not anticipated by Ryan. As already noted, Ryan also does not disclose "combining the information from the feedback system with the information from the scanning system and . . . filtering the combined information for relevance to at least one of the query and the first user," and thus cannot deliver the filtered information to the user, as required by claim 5.

130.   With respect to claim 6 of the '664 patent, although Dr. Ungar states that Ryan anticipates claim 6 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 6 depends, claim 6 is not anticipated by Ryan.

131.   With respect to claim 21 of the '664 patent, although Dr. Ungar states that Ryan anticipates claim 21 of the '664 patent, I disagree. For the reasons already noted in connection with claim 1, from which claim 21 depends, claim 21 is not anticipated by Ryan.

132.   With respect to claim 22 of the '664 patent, although Dr. Ungar states that Ryan anticipates claim 22 of the '664 patent, I disagree. For the reasons already noted in connection with claim 21, from which claim 22 depends, claim 22 is not anticipated by Ryan.

133.   With respect to claim 26, Dr. Ungar states that Ryan anticipates claim 26 of the '664 patent for the same reasons that it anticipates claim 1. Thus, for at least the reasons that I have opined with respect to claim 1, claim 26 is not anticipated by Ryan.

134.   With respect to claim 28 of the '664 patent, although Dr. Ungar states that Ryan anticipates claim 28 of the '664 patent, I disagree. For the reasons already noted in connection with claim 26, from which claim 28 depends, claim 28 is not anticipated by Ryan. As already noted, Ryan does also not disclose "combining the information found to be relevant to the query by other users with the searched information [and] . . . filtering the combined information for relevance to at least one of the query and the first user", and thus cannot deliver the filtered information to the user, as required by claim 28.

135.   With respect to claim 38 of the '664 patent, although Dr. Ungar states that Ryan anticipates claim 38 of the '664 patent, I disagree. For the reasons already noted in connection with claim 26, from which claim 38 depends, claim 38 is not anticipated by Ryan.

XIV.   OBVIOUSNESS CONSIDERATIONS

A. Combining methods and/or systems to find "relevance" is what this entire field is about

136.   As evident from the prior art references, inventors in this field were attempting to use the data in rating systems in many different ways. For example, in Rose, the inventors were attempting to evaluate documents using user profiles and feedback data. In Ryan, the inventors were attempting to provide lists of results from multiple search engines that use different criteria. In Bowman and Culliss, the inventors were attempting to use feedback data to augment a word index for ranking search results. In Lashkari, the inventors were attempting to use an additive system to rank items using separate ranking sources.

137.   The essence of this field in 1998 (at the time of invention) was developing distinct

formulas or methods that analyze available data to produce results tailored to a particular

information need. Although many patents have been issued on various ways to combine or use

different types of available data to address a particular information need, the '420 and '664

patents are directed to a novel relevance analysis for query-based searches and query-relevant

filtering – an innovative solution particularly tailored for a distinct information need.

B. "Filtering" and "Ad-hoc Search" were two different fields

138.   In 1998, "filtering" and "ad-hoc search" existed as two different fields, addressing

two different information needs. "Filtering" addressed a long term information need, and usually

utilized complex filtering profiles that are built and adapted over time to better understand a

user's preferences. A filter typically extracted relevant incoming information and placed it into

repositories for a user's viewing based on that user's preferences.

139.   "Ad-hoc Search," on the other hand, addressed short-term, on demand

information needs, and utilized a query provided by a user. Searches needed to provide an

instant, ad hoc response to a user's current and immediate information need.

140.   In 1998, these fields were distinct. For example, as I understand it, Mr. Kosak

and Mr. Lang themselves worked on filtering techniques and did not become involved with

search technologies until they joined Lycos. Prior to this, their system (WiseWire) was a

filtering system based on user profiles. As another example, the Text Retrieval Conference

(TREC), a government sponsored information retrieval conference, had a "Filtering Track" and a

"Query Track." [6] IPE 0032858-32873; IPE 0032874-32903. Participants in one track generally

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[6] "The three TREC conferences have all centered around two tasks based on traditional
information retrieval modes: a 'routing' task and an 'adhoc' task. In the routing task it is
assumed that the same questions are always being asked, but that new data is being searched.

did not participate in the other, and there was generally no overlap in the subject matter of papers and presentations. IPE 0032874-32903.

C. "Profile" and "Ad-hoc Search" were technically different

141. "Profile" and "Ad-hoc Search" systems use two different sets of data structures, and diverging system architectures.

142. Profile systems are built to deliver personalized results over time. Profile systems have the information request (or information interest) in advance, and receive the items of information over time. They generally have information about a user or user group, and therefore have very complex data structures that represent the information interest. These profiles may be updated incrementally upon receiving user feedback. Profile systems filter incoming information, and generally utilize less data about the incoming information (for instance they do not generate an inverted index over the complete set of documents). The incoming information is compared to the complex data structure, and may be selected to deliver relevant information to a user. Profile systems consider each incoming document independently of all other documents and make a binary decision as to whether to retain and deliver it, or discard it. Many of these systems do not need to deliver instant results – so they can take a longer period to determine whether and how to filter an item.

This task is similar to that done by news clipping services or by library profiling systems. In the adhoc task it is assumed that the new questions are being asked against a static set of data." *See* Chapter 1, Section 2, page 1 of : D. K. Harman (ed), *Overview of the Third Text REtrieval Conference (TREC-3)*, NIST Special Publication 500-225, 1995; *see also* NIST TREC website ("Filtering track: A task in which the user''s information need is stable (and some relevant documents are known) but there is a stream of new documents. For each document, the system must make a binary decision as to whether the document should be retrieved (as opposed to forming a ranked list)."). The "adhoc task" was later labeled as "ad-hoc retrieval." The "routing task" was later labeled "filtering task" or "binary classification."

143.   Search systems are built to deliver results tailored to a particular query instantly. These search systems have the items of information (or documents) in advance. The search systems may build a comprehensive inverted index from the terms to the documents that contain them before processing any queries. Then ad-hoc search systems receive queries over time and may use the inverted index to generate near instant responses addressing the immediate information need of a user represented by a query. An incoming query is typically short allowing for rapid analysis of the stored documents, providing a near instant, ranked list of results. The analysis needed to be relatively simple, so that the information could be provided quickly, especially in light of the 1998 computational infrastructure.

D. At the time of invention, it would not have been obvious to add complexity to Internet Search

1.   The "Rush to Market" Favored Less Complex Solutions

144.   In 1998, when the prior art references and the '420 and '664 patents were being filed, those in the field were simply not looking to add complexity to their internet search solutions. Then, there was a need to "rush to market" during this first internet boom period, and additional complexity was seen as a liability to and distraction from getting to the market. Accordingly, successful internet solutions were those that were simple and fast, not complex, and could be implemented quickly.

2.   Existing Computational Infrastructure Favored Less Complex Solutions

145.   In addition to the economic reasons and rush to the market, there were technical reasons teaching away from implementing a combination of collaborative feedback data and content profile data related to a query to filter in a search engine system because it would have required additional computation both for collection and use of that data. At the time, cloud

computing had not yet been invented and internet bandwidth was much lower than it is today.

Implementing a combination of collaborative feedback data and content profile data related to a

query to filter in a search engine system would have slowed the system on both accounts.

Accordingly, it would not have been something that those of ordinary skill in the art at the time

of invention were likely to consider. Without hindsight of today's technology and

advancements, it would have been difficult for one of ordinary skill in the art at the time of

invention to develop a combination of collaborative feedback data and content profile data

related to a query to filter in a search engine.

XV. RESPONSE TO DR. UNGAR'S "THE ASSERTED PATENTS ARE A COMBINATION OF PRIOR ART ELEMENTS" SECTION

146.   In paragraph 223 of his report, Dr. Ungar begins his analysis on how the asserted

claims are allegedly rendered obvious in light of the prior art. Dr. Ungar opens by stating that

"each of the elements of the '420 and '664 Patents was present in the prior art." I disagree. The

cited references, even considered together, fail to disclose the following claim elements:

- "the filter system combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query," as recited in claim 10 of the '420 patent;

- "combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query," as recited in claim 25 of the '420 patent;

- "a content-based filter system for combining the information from the feedback system with the information from the scanning system and for filtering the combined information for relevance to at least one of the query and the first user," as recited in claim 1 of the '664 patent; and

- "combining the information found to be relevant to the query by other users with the searched information; content based filtering the combined information for relevance to at least one of the query and the first user," as recited in claim 26 of the '664 patent.

147.   Additionally, Dr. Ungar fails to address the claimed invention as a whole when addressing obviousness. Instead, he addresses obviousness on a self-defined element by element basis.

148.   Dr. Ungar, in paragraph 228 of his report, states that "numerous prior art references combined content-based filtering with feedback-based filtering to filter information," referring to Rose, Bowman, Laskkari and Balabanovic.

149.   As noted above, Rose does not teach or suggest combining feedback data with content data in filtering information.

150.   Further, Dr. Ungar states that "Bowman discloses that an item's relevance score is derived by combining: (1) feedback showing how often other users who entered the same query selected the item; and (2) content analysis showing how many terms from the query appear in the items content. (Bowman at claims 28-29)." As noted above, Bowman does not teach or suggest combining feedback data with content data in filtering information.

151.   Additionally, Dr. Ungar states that Lashkari meets the claim limitation. As noted above, Lashkari does not teach or suggest combining feedback data with content data in filtering information relevant to a query.

152.   Finally, Dr. Ungar states that "Balabanovic states that '[b]y combining collaborative and content-based filtering systems, Fab may eliminate many of the weaknesses found in each approach.'" Balabanovic, however, fails to teach or suggest combining feedback data with content data in filtering information relevant to a query. Instead, Balabanvic describes a collaborative feedback method which does not constitute as a search engine and does not take the query into account in its processing.

XVI. RESPONSE TO DR. UNGAR'S "THE COMBINATION IN THE ASSERTED PATENT CLAIMS ARE PREDICTABLE AND DO NOT YIELD ANY UNPREDICTABLE RESULTS" SECTION

153. In carrying out his obviousness analysis in paragraph 234 of his report, Dr. Ungar relies on the Supreme Court decision in *KSR*. However, in citing the case, I understand that he fails to completely quote the cited passage of the case. I understand that Dr. Ungar left out the underlined portion:

> "When a work is available in one field, design incentives and other market forces can prompt variations of it, either in the same field or another. If a person of ordinary skill in the art can implement a predictable variation, and would see the benefit of doing so, Sec 103 likely bars its patentability."

154. As such, Dr. Ungar fails to account for an important aspect of the obviousness analysis, because he does not fully address the perspective of one of ordinary skill in the art in evaluating the prior art. In particular, Dr. Ungar does not address whether a person of ordinary skill in the art would see the benefit of combining the teachings of the prior art to yield the claimed invention of the '420 and '664 patents. In this regard, I understand that, in its *KSR* decision, the Supreme Court also indicated that "to determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents."

155. Dr. Ungar, in paragraph 235 of his report, states that "[c]ombining the elements of the asserted patents was predictable." I disagree for at least the following reasons.

156. In reviewing the prior art that Dr. Ungar relies in his obviousness analysis, it is apparent that they fall into two groups. The first group includes Bowman, Culliss and Ryan. I will refer to these as the Ad-hoc search group. The second group includes Balabanovic, Lashkari, Loeb and Rose. I will refer to these as the profile group. The Ad-hoc search group

builds an index relating terms to documents and produces a ranked list of results in response to a query. The profile group compares users to other users or items to other items (e.g., documents) rather than indexing terms to items and operates on a reduced set of items, such as search results produced by an external system or an incrementally incoming stream of items (or documents). Consistent with my narrative above, these two groups represent fundamentally different approaches to information access.

157.   In the prior art (in 1998), the two primary approaches underlying the Ad-hoc search and profile groups were not integrated. In fact, when a profile system needed search, it relied upon the user accessing an external search engine to obtain search results and then pass these results to the profile system. *See e.g.*, Lashkari at 78. The profile system operated without reference to the user query from which the search engine produced its search results. Moreover, the profile system operated on a much smaller data set than the ad-hoc search system. In this manner both systems operated independently of each other.

158.   In view of the foregoing, it is not surprising that at least some of the elements of the asserted claims are not found in the prior art. For instance, none of prior art relied upon by Dr. Ungar taken either alone or in combination teach or suggest the following claim elements:

- "the filter system combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query," as recited in claim 10 of the '420 patent;

- "combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query," as recited in claim 25 of the '420 patent;

- "a content-based filter system for combining the information from the feedback system with the information from the scanning system and for filtering the combined information for relevance to at least one of the query and the first user," as recited in claim 1 of the '664 patent; and

- "combining the information found to be relevant to the query by other users with the searched information; content based filtering the combined information for relevance

to at least one of the query and the first user," as recited in claim 26 of the '664 patent.

159.   At the time, one of ordinary skill in the art would not have appreciated the advantage to be had in developing a search engine system integrally combining collaborative and content based filtering with relevance to the query.

160.   Having worked in academia and industry at that time, one of ordinary skill in the art would have a bachelor's degree in computer science or the equivalent and 2 or 3 years of experience in information systems. Dr. Ungar proposes that a person of ordinary skill in the art in 1998 would have a bachelor's degree in computer science (or having equivalent programming experience to someone with such a degree) and 2-3 years of experience in the field of information retrieval. Back in 1998, there were very few computer scientists with over 2 years of experience in the narrow field of information retrieval. Hence, the broader category of information systems, which still includes a rigorous computer science foundation, is a more appropriate characterization of the experience level of one of ordinary skill in the art at that time period.

161.   In the mid and late 90s, much of the work in search engines revolved around issues such as finding more relevant documents (in particular a higher density of relevant documents that ranked high) via improved ranking functions and improved spidering rather than addressing issues of selecting among good search results to display the better search results. By better search results, I mean that the retrieval and filtering steps share common criteria, such as the immediate information need of the user as reflected in the query or terms thereof. Some forward thinkers, including those cited in the prior art by Dr. Ungar, thought about post-processing search results via collaborative methods. However, no one was proposing a tight integration, as would be required for collaborative and content filtering with respect to the query.

One of ordinary skill in the art would not have appreciated the benefit of such tight integration and would, at best, have followed the approach of post-processing results, as in the cited art. The added advantage of tight integration is responsiveness to the immediate information need (the query), as well as sensitivity to long term preferences.

162.   Dr. Ungar, in paragraph 235 of his report, claims that "combining the elements of the asserted patents was predictable. The elements were available in combination and only with slight variations in the very same field of information retrieval and filtering." First, this is untrue because as I stated earlier not all of the claim limitations were taught or suggested by the prior art references relied upon by Dr. Ungar. Second, as I pointed out earlier, there were two groups of systems, those that were based on ad-hoc search and those that were based primarily on profile techniques. The methods from each group had never been tightly integrated, in part, because they relied on fundamentally different techniques.

163.   The ad-hoc search systems rely on term-item correlation tables, including inverted indexes. In contrast, the profile systems rely on user-user correlations and item-item correlations. There was no predictable way to bring query-item or term-item relevance into user-user correlations or item-item correlations. A person of ordinary skill in the art would not have been able to successfully integrate a system of each type (i.e., ad-hoc search systems and profile systems) in a manner required for collaborative and content filtering with respect to the query.

164.   Dr. Ungar goes on to state that "this combination adds nothing to the nature and quality of each of the individual elements on its own." I disagree. First, Dr. Ungar does not refer to any particular combination, and as I have noted, the prior art references relied upon by Dr. Ungar fails to teach or suggest each and every limitation of the asserted claims. Second, the combination of limitations in claims 10 and 25 of the '420 patent, and claims 1 and 26 of the

'664 patent produce better search results, in which the retrieval and filtering steps share common criteria, such as the immediate information need of the user as reflected in the query or terms thereof. One of ordinary skill in the art would not have appreciated the benefit of such tight integration and would, at best, have followed the approach of post-processing results, as in the cited art. Viewing the interrelated teachings of the prior art references relied upon by Defendants and Dr. Ungar, there was no consideration or attempt to tightly integrate ad-hoc search systems and profile systems.

XVII. RESPONSE TO DEFENDANTS' AND DR. UNGAR'S OBVIOUSNESS COMBINATIONS

A. Rose in View of Bowman

165. Defendants and Dr. Ungar assert that the combination of Rose in view of Bowman renders obvious claims 10, 14, 15, 25, 27 and 28 of the '420 patent and claim 5 of the '664 patent. I disagree.

166. Dr. Ungar appears to concede that Rose does not disclose "a content-based filter system for receiving the informons from the scanning system and for filtering the informons on the basis of applicable content profile data for relevance to the query" or "the filter system combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query."

167. Referring to paragraphs 251, 252 and 255 of his report, Dr. Ungar relies upon Bowman to cure the deficiencies of Rose. However, as discussed above, when addressing anticipation of Bowman, Bowman fails to disclose either limitation. First, Bowman does not teach or suggest filtering search results for relevance to a query. Second, Bowman does not teach or suggest combining content-based and feedback-based methods to filter search results for relevance to a query. Even if one of ordinary skill were to combine Rose and Bowman, which I

do not believe would be plausible in 1998, the result would be a ranking system. Both prior art references teach or suggest a ranking system, not a filtering one. Moreover, a popularity based search engine such as Bowman (as I state above) would not be combined with a content (descriptions of items and users) search system such as Rose because they have diverging internal techniques. Contrary to Dr. Ungar's statement, Rose and Bowman do not propose similar approaches but instead work in different ways, which are difficult to reconcile.

168.   Furthermore, Dr. Ungar's statement: "[w]hile Rose uses this hybrid filtering method to filter documents for relevance to the user, it would be obvious to modify Rose so that it filtered for relevance to the query. This could be done simply by comparing each document vector to a query vector instead of to a user vector, and by recording feedback from the subset of other users who had entered the same search query (instead of recording feedback from all users). There are no technical difficulties to modifying Rose in this manner" is incorrect. Rose does not teach or suggest the tools necessary to be a functioning search engine. Moreover, there is nothing simple about modifying Rose to do what Dr. Ungar claims.

169.   With respect to claims 14 and 15 of the '420 Patent, although Dr. Ungar states that Rose in view of Bowman renders obvious claims 14 and 15 of the '420 patent, I disagree. For the reasons already noted in connection with claim 10, from which claims 14 and 15 depend, claims 14 and 15 are not rendered obvious by the combination of Rose in view of Bowman.

170.   With respect to claim 25 of the '420 patent, Dr. Ungar states that Rose in view of Bowman renders obvious claim 25 for the same reasons that it renders obvious claim 10. Thus, for at least the reasons that I have opined with respect to claim 10, claim 25 is not rendered obvious by the combination of Rose in view of Bowman. With respect to claims 27 and 28 of the '420 Patent, although Dr. Ungar states that Rose in view of Bowman renders obvious claim

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25 of the '420 patent, I disagree. For the reasons already noted in connection with claim 25, from which claims 27 and 28 depend, claims 27 and 28 are not rendered obvious by the combination of Rose in view of Bowman.

171. With respect to claim 5 of the '664 patent, although Dr. Ungar states that Rose in view of Bowman renders obvious claim 5 of the '664 patent, I disagree. For the reasons already noted above, claim 5 is not rendered obvious by the combination of Rose in view of Bowman (also given the disclosures of Culliss and Ryan).

B. Lashkari in View of Bowman

172. Defendants and Dr. Ungar assert that the combination of Lashkari in view of Bowman renders obvious claims 14, 15, 27 and 28 of the '420 patent and claim 5 of the '664 patent. I disagree.

173. With respect to claims 14, 15, 27 and 28 of the '420 patent, Dr. Ungar appears to concede that Lashkari does not disclose where "collaborative feedback data comprises passive feedback data." In paragraph 262 and 263 of his report, Dr. Ungar relies upon Bowman to modify Lashkari to cure the deficiencies of Lashkari. However, it would not have been obvious to modify Lashkari so that it utilized passive feedback in the manner that Bowman does because Bowman only teaches modifying term weights in an index with respect to user clicks on selected search results. Lashkari requires more complex explicit feedback as stated on page 57 of Lashkari where a 7-point scale is provided for specific user feedback. Clicking on documents at best provides a binary scale.

174. With respect to claim 5 of the '664 patent, although Dr. Ungar states that Lashkari in view of Bowman renders obvious claim 5 of the '664 patent, I disagree. For the reasons

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already noted above, claim 5 is not rendered obvious by the combination of Rose in view of Bowman (also given the disclosures of Culliss and Ryan).

C. Ryan in View of Rose

175.   Defendants and Dr. Ungar assert that the combination of Ryan in view of Rose renders obvious claims 21 and 22 of the '664 patent. I disagree.

176.   In paragraph 268 of his report, Dr. Ungar appears to concede that Ryan fails to disclose the added limitations of claims 21 and 22. To cure these shortcomings, Dr. Ungar relies upon Rose. As noted above, however, Rose fails to teach or suggest where "the content-based filter system filters by extracting features from the information" or where "the extracted features comprise content data indicative of the relevance to the at least one of the query and the user." It would not have been obvious to combine the teachings of Rose with the teachings of Ryan because they operate in such different ways. Consistent with my statements above, Ryan is an ad-hoc search whereas Rose is a profile system.

XVIII.   RESPONSE TO DR. UNGAR'S "THE COMBINATIONS IN THE ASSERTED PATENTS DO NOT YIELD UNPREDICTABLE RESULTS" SECTION

177.   Many of the claim limitations of the '420 and '664 patents were not well known in the art and some were absent altogether. As noted above, the inventors of the ad-hoc search system patents concentrate much of their work on comparison to the user's immediate information need (i.e., the query), and do so using inverted indexing methods relying on the brevity of queries. The remaining prior art references relied upon by Dr. Ungar such as Rose, Balabanovic and Lashkari focus on comparison to a user or the user's profile – profile systems. Ignoring the immediate information need or query of a user, which Rose, Balabanovic and Lashkari do, would result in an inferior result compared to that of the '420 and '664 patents. The

combination of query, content and collaborative feedback to filter in a single engine can yield

results superior to applying less than all of them or applying them in a sequence. In 1998, using

all three filtering criteria in a joint optimization, as taught by the '420 and '664 patents, would

yield superior results in cases where the first step (e.g., web search) may discard the globally

optimal result. For instance, if the top document considering content-based criteria and

collaborative-based criteria were ranked by the search engine, the prior art references relied upon

by Defendants and Dr. Ungar would fail to consider it, although it may have well been the top

selection if combining the criteria. This would be have been unpredictable to a person of

ordinary skill in the art at the time of invention because 1) it required applying knowledge of

global optimization versus local optimization, and 2) it required a means of tightly integrating

ad-hoc search systems and profile systems which was not known in 1998.

XIX. RESPONSE TO DR. UNGAR'S "ONE SKILLED IN THE ART WOULD HAVE BEEN MOTIVATED TO PURSUE THE CLAIMED COMBINATIONS THROUGH MARKET FORCES AND TRENDS" SECTION

178.   In paragraphs 275 and 276 of his report, Dr. Ungar's comments again are

irrelevant because they are not related to relevance to a query. These references are missing the

immediate information need of a user represented by a query, a fundamental element of the

asserted claims. Moreover, as noted above, the market forces were 1) the "rush to market" in the

internet industry of 1998 (the bubble period), 2) providing immediate response to the user given

the 1998 infrastructure, and 3) the simplest combination of known systems (e.g., search followed

by profile post-processing). All three of these forces favored simplicity over complexity and

thus taught away from the novel solutions of the asserted claims of the '420 and '664 patents.

Not surprisingly, it took several years for the field to catch up and employ the techniques of the

asserted claims.

XX. RESPONSE TO DR. UNGAR'S "THE GRAHAM FACTORS DEMONSTRATE THAT THE '420 AND '664 PATENT CLAIMS WHICH MERELY COMBINE KNOWN ELEMENTS ARE OBVIOUS" SECTION

A. Primary *Graham* Factors

179.   I have addressed many of the Graham factors throughout my report. As stated above, none of the prior art references relied upon by Defendants and Dr. Ungar disclose, teach or suggest all of the limitations of the asserted claims. In fact, certain limitations of the asserted claims are not disclosed, taught or suggested by any prior reference relied upon by Defendants and Dr. Ungar. Moreover, none of the prior art references relied upon by Defendants and Dr. Ungar render obvious the asserted claims.

180.   Dr. Ungar states that "[t]he Graham factors demonstrate that the '420 and '664 patent claims which merely combine known elements are obvious." As I have already noted, none of prior art references relied upon by Defendants and Dr. Ungar taken either alone or in combination teach or suggest the following claim elements:

- "the filter system combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query," as recited in claim 10 of the '420 patent;

- "combining pertaining feedback data from the feedback system with the content profile data in filtering each informon for relevance to the query," as recited in claim 25 of the '420 patent;

- "a content-based filter system for combining the information from the feedback system with the information from the scanning system and for filtering the combined information for relevance to at least one of the query and the first user," as recited in claim 1 of the '664 patent; and

- "combining the information found to be relevant to the query by other users with the searched information; content based filtering the combined information for relevance to at least one of the query and the first user," as recited in claim 26 of the '664 patent.

181.   Moreover, none of the references relied upon by Defendants and Dr. Ungar would have rendered the asserted claims of the '420 and '664 patents obvious for at least the reasons already addressed in my report.

1.   The Scope and Content of the Prior Art

182.   In paragraph 278, Dr. Ungar states that the first Graham factor (i.e., "the scope and content of the prior art") shows the asserted patents to be obvious. I understand, however, that an obviousness determination requires an analysis of all of the Graham factors and not just a single factor in isolation. Dr. Ungar further states that "each element of the asserted patents existed in the prior art," citing VII.B of his report. In Section XV of my report, I address Section VII.B of Dr. Ungar's report, which fails to address each and every claim element of the asserted '420 and '664 patent claims for the reasons noted therein.

183.   In paragraph 279 of his report, Dr. Ungar cites Balabanovic and Rose for the proposition that "the idea of combining collaborative and content-based filtering with collaborative or feedback-based filtering was well-known in the art." Neither reference, however, teaches or suggests the use of such concepts in the manner recited in the asserted claims of the '420 and '664 patents. Dr. Ungar further asserts that "[a]lso known was the idea that such hybrid methods could be used to filter search results for relevance to the query citing Bowman and Culliss." Neither Bowman nor Culliss, however either alone or in combination, teach or suggest the use of filtering in the manner recited in the asserted claims of the '420 and '664 patents.

2.   The Differences Between the Prior Art and the Claims at Issue

184.   With regard to the second Graham factor (i.e., "the differences between the prior art and the claims asserted"), Dr. Ungar asserts in paragraph 280 of his report that "each element

of the asserted patents existed before and each claim of the patent is anticipated." As I have already noted, all features of the asserted claims of the '420 and '664 patents are not disclosed in the prior art. Accordingly, the prior art references relied upon by Defendants and Dr. Ungar do not anticipate the asserted claims for the reasons already noted above in Section VIII-XIV of my report.

185. In paragraph 280 of his report, Dr. Ungar states that "to the extent there is any difference at all between the prior art and the claims, however, it would be obvious to one of ordinary skill to add any missing elements of the asserted claims to each prior art reference described above." In support of this broad statement, Dr. Ungar asserts that the "concept of filtering information using a combination of content- and feedback-based methods was well-known in the art and would have been obvious." (citing generally Sections VII.B and VII.C of his report (which have already been addressed above in my report) and, more specifically, Rose, Bowman, Lashkari and Balabanovic). In addition, Dr. Ungar states that "the concept that such methods could be used to filter search results for relevance to a query or user was well known and obvious." (citing Bowman, Lashkari and a December 6, 2000 Office Action).

186. As I have already noted, the four references cited by Dr. Ungar fall into two groups. In particular, Bowman falls into the Ad-hoc search group, and Balabanovic, Lashkari and Rose fall into the profile group. The Ad-hoc search group builds an index relating terms to documents and produces a ranked list of results in response to a query. The profile group compares users to other users or items to other items (e.g., documents) rather than indexing terms to items and operates on reduced set of items, such as search results produced by an external system or an incrementally incoming stream of items (or documents). These two groups represent fundamentally different approaches to information access. In the prior art (in 1998),

the two primary approaches underlying the Ad-hoc search and profile groups were not integrated. In fact, when a profile system needed search, it relied upon the user accessing an external search engine to obtain search results and then pass these results to the profile system for post-processing of the results. The profile system operated without reference to the user query from which the search engine produced its search results. In this manner both systems operated independently of each other.

187. Viewing the interrelated teachings of the prior art references relied upon by Dr. Ungar, there was no consideration or attempt to tightly integrate ad-hoc search systems and profile systems such that they would integrate the "concept of filtering information using a combination of content- and feedback-based methods," as stated by Dr. Ungar, in the manner recited in the asserted claims of the '420 and '664 patents.

3. The Level of Ordinary Skill in the Art

188. With regard to the third Graham factor (i.e., "the level of Ordinary Skill in the Pertinent Art"), Dr. Ungar opines in paragraph 284 that "an individual with a BS degree in computer science or having equivalent programming experience to someone with such a degree, plus 2-3 years of experience in the field of information retrieval, would be aware of the scope and content of the prior art." First, as already noted above, back in 1998, there were very few computer scientists with over 2 years of experience in the narrow field of information retrieval. Hence, the broader category of information systems, which still includes a rigorous computer science foundation, is a more appropriate characterization of the experience level of one of ordinary skill in the art at that time period.

189. In paragraph 283, Dr. Ungar states that "the asserted patents apply non-novel information filtering techniques to the problem of determining the relevance of documents to a

query and/or a user" and that "one skilled in the art would be familiar with the underlying techniques and would immediately see the possibility of applying them to the problem of the patents, as evidenced by the numerous prior art systems using the same techniques towards the same end."

190.   As I have already noted, viewing the interrelated teachings of the prior art references relied upon by Dr. Ungar, there was simply no consideration or attempt by those skilled in the art to tightly integrate ad-hoc search systems and profile systems in the manner recited in the asserted claims of the '420 and '664 patents. It is my opinion that one of ordinary skill in the art in 1998 would not have immediately seen the possibility of achieving such tight integration as reflected in the asserted claims of the '420 and '664 patents, and that the asserted claims of those patents would not have been obvious to one of ordinary skill in the art.

B. Secondary Considerations

191.   With respect to secondary considerations, there are considerations that would overcome any determination of obviousness. First, the commercial success of tightly integrating query, content data and collaborative feedback data in the manner taught by the '420 and '664 patents is evidenced by the activities of modern search engines including Google. I understand from Dr. Frieder that Google's system uses a combination of content data and collaborative feedback data to filter advertisements for relevance to the query. I understand from Dr. Becker that Google's system is commercially successful.

192.   Furthermore, there clearly was a long felt recognized need to improve search. The prior art references relied upon by Defendants and Dr. Ungar makes this case evident. Moreover, the same prior art references attempted to address this need with half measures by combining some of the elements while not using others and failed to arrive at a tight integration.

Both the disclosure of the need and the attempts to meet it provide strong evidence for a long felt, but unresolved need.

193. As discussed throughout this report, the prior art references relied upon by Defendants and Dr. Ungar attempted to meet the need in different, incomplete and partial ways. They all failed to disclose a tight integration between ad-hoc search systems and profile systems as required to produce globally optimum filtering results. As such, this satisfies one of the secondary considerations – the failures of others – of the Graham factors.

Executed on this 29th day of August, 2012, in Pittsburgh, PA.

By

Jaime Carbonell

August 29, 2012