

DECLARATION OF DR. LATIFUR KHAN

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

X CORPORATION

Petitioner,

v.

STERLING COMPUTERS CORPORATION

Patent Owner.

Case IPR2025-00299

U.S. Patent No. 7,716,217

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DECLARATION OF DR. LATIFUR KHAN

LATIFUR KHAN hereby Declares as follows:

1. I hold a Ph.D. in Computer Science from the University of Southern California. I hold an M.S. in Computer Science from the University of Southern California. I hold a B.S. in Computer Science and Engineering from the Bangladesh University of Engineering and Technology.

2. I have been retained by Sterling Computers Corporation (“Sterling”) and Sterling’s counsel in connection with Patent Trial and Appeal Board proceedings relating to certain patents owned by Sterling. I understand that these proceedings are *inter partes* reviews relating to Sterling’s U.S. Patent Nos. 7,716,217.

3. I am being compensated for my time at a rate of \$350 per hour. My compensation is not contingent on the opinions that I express or on the outcome of these proceedings.

4. The statements made in this Declaration are based on my own personal knowledge unless otherwise indicated.

5. Before I address my professional background and the details of the technology at issue, I would like to provide the Board with a summary of what is missing from the prior art references upon which Dr. Houh relies.

I. Introduction

6. The ‘217 Patent at issue in this proceeding teaches a system and a method for determining a relevance score of a piece of electronic content sent from a sender to a user. As part of its process for determining a relevance score, every claim of the ‘217 Patent requires a specific action: the system/method must “*identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” **None** of the prior art references that Dr. Houh relies upon – i.e., none of Kircher, Krug, Dumais, or Marston – teach or suggest this limitation.

7. The ‘217 Patent’s “*identify ...*” limitation has multiple requirements. First, the ‘217 Patent’s “*identify ...*” requires an association between two different users: (1) the first user (the user that has received the piece of content that needs to be scored) and (2) second user (“*one other of the plurality of users*”). An example of how the two users must be associated with each other is in the claim language requiring that the second user must be “*cognate to the [first] user.*” Second, the ‘217 Patent’s “*identify ...*” limitation requires that the two users must be associated with each other in **two ways**: the second user must be “*cognate to the [first] user,*” and both users must have received the same piece of electronic content (the first user is the user referred to in “*a piece of content sent from a sender to a user,*” and

the second user must be “a recipient of the piece of electronic content”). Finally, the ‘217 Patent’s “*identify ...*” limitation requires an active step: “*identify[ing]*.” The ‘217 Patent teaches why it is desirable to “*identify*” a second user that shares these associations with the first user, and the ‘217 Patent teaches the math required in order for the system to “*identify*” the second user.

8. None of the prior art references disclose “*identify[ing]*” a second user with these characteristics. Kircher is focused on the first user’s actions and does not “*identify*” any other user. For this reason, in the Kircher-Krug combination, Dr. Houh relies upon Krug for the “*identify ...*” limitation. Krug, however, also does not teach or suggest the “*identify ...*” limitation. Although Krug teaches, for example, that a “user group” of all users who accessed an object can be formed, Krug does not try to “*identify...*” whether both the first user (the user doing the searching) and also some second user are both part of that group (i.e., whether they both accessed the same object). I note that Dr. Houh’s analysis of the “*recipient*” limitation does not even address the requirement to “*identify...a recipient.*” Krug also does not “*identify...*” whether both the first user (the user doing the searching) and also some second user are both part of both groups (i.e., whether they both accessed the same object and also are part of a group that shares some other

similarity (e.g., they are both women)). Therefore, the Kircher-Krug combination does not teach or suggest the “*identify ...*” limitation.

The concept of a cognate user in the '217 patent cannot be equated with Krug's group profiles. In the '217 patent, n cognate users are identified for each recipient based on similar past actions, making the group specific to that individual and different for every recipient. By contrast, Krug defines group membership either explicitly—when a user logs into a community—or implicitly, based on shared properties. In both cases, the resulting group profile is the same for all users within that group. Thus, Krug's group profile does not meet the requirement of a recipient-specific cognate user list as described in the '217 patent.

9. Dumais similarly does not teach or suggest the “*identify...*” limitation. Although Dumais discusses, for example, similarity computations based upon “usage of items,” Dumais does not “*identify...*” whether both the first user (the user doing the searching) and also some second user are both part of that group (i.e., whether they both used the same object). I note that Dr. Houh's analysis of Dumais and the “*recipient*” limitation does not even address the requirement to “*identify...a recipient.*” Dumais also does not “*identify...*” whether both the first user (the user doing the searching) and also some second user are **both** part of **both** groups (i.e., whether they both used the same item and also share some other

similarity). Therefore, Dumais also does not teach or suggest the “*identify ...*” limitation.

II. Professional Background

10. I earned a B.S. in Computer Science and Engineering from Bangladesh University of Engineering and Technology in November 1993. I graduated First Class with Honors. I earned an M.S. in Computer Science from the University of Southern California in December 1996 and a Ph.D. in Computer Science, also from the University of Southern California in August 2000. I am presently a Professor in the Computer Science Department at the University of Texas at Dallas, a position I have held since September 2012. Before that, I served as an Assistant Professor and Associate Professor at the University of Texas at Dallas from September 2000 through August 2006 and from September 2006 through August 2012, respectively.

11. The quality and significance of my research has been recognized by many of my field’s top awards including the IBM Faculty Award (Research) in 2016 (Fundamental Research on Data Analytics (Stream Mining)); IEEE (Institute of Electrical and Electronics Engineers) Technical Achievement Award in 2012 (IEEE Systems Man and Cybernetics Society and the IEEE Transportation Systems Society); and the Fellow of Institute of Electrical and Electronics

Engineers (IEEE), American Association for the Advancement of Science (AAAS), Institution of Engineering and Technology (IET), and British Computer Society(BCS). My co-authors and I received a number of Best Paper Awards from various IEEE and ACM (Association for Computing Machinery) conferences. I have been recognized as one of the ACM Distinguished Scientists since December 2012. Other awards I have received include the UTD Inventor Award (April 2010 & December 2011), the UTD Author Recognition Award (October 2009), and the Chancellor Award from the President of Bangladesh.

12. I also serve my communities in various leadership positions through my role as editor, including serving as Associate Editor of ACM Transaction on Knowledge Discovery and Data (TKDD), (2021 -); ACM Transaction on Internet Technology (TOIT), (2019 – 2023); IEEE Transactions on Artificial Intelligence (TAI), (2021-2023); IEEE Transactions on Knowledge & Data Engineering (TKDE)(2011-2015); Associate Editor of International Journal of Data Mining, Modeling and Management (IJDMMM), Inderscience Publishers, Switzerland (since 2008); Associate Editor of International Journal of Security Informatics, Springer ISSN: 2190-8532; and Associate Editor of Computer Standards and Interface Journal by Elsevier Publishing (2006 – 2009).

13. As part of my service to the community, at academic and industry conferences hosted by IEEE, ACM and SIAM (Society for Industrial and Applied Mathematics) over the past few decades, I have served numerous leadership roles, including as the keynote speaker, chair/co-chair, program committee member, presenter of tutorials, session chair, and panelist. I have been invited to present at Universities around the world and have been invited to review many books and journals. I have given lectures at Boeing, AT&T, IBM, TI, Raytheon, and Verizon.

14. My research has been recognized through the award of research grants, and I have served as principal investigator on over three dozen research grants from federal funding agencies and major corporations on the subjects of Data Mining, Data Management, Information Extraction and Retrieval, Cyber-Security and Data Sciences.

15. My research has been published in over 50 technical journal articles in top peer-reviewed journals, including in ACM Transactions and IEEE Transactions journals. My work has been cited more than 16,000 times and my h-index is 69 (meaning I have at least 69 publications that have been cited 69 or more times) according to Google scholar (<https://scholar.google.com/citations?hl=en&user=8Qt10f4AAAAJ>). I have

authored five books namely, (a) Design and Implementation of Data Mining Tools, (b) Big Data Analytics with Applications in Insider Threat Detection, (c) Data Mining Tools for Malware Detection, (d) Analyzing and Securing Social Networks, and (e) Secure Data Science: Integrating Cyber Security and Data Science (<https://www.thriftbooks.com/a/latifur-khan/2403464/?srsltid=AfmBOoqX9orqfM2rYz-aPeIkDLdGmtkBT7RjgQ7z5MRXCwAjpOaLofl5>).

16. In addition, my research has resulted in my (co)inventing many technologies in my areas of research. As a result, I have filed patent applications, three of which are now fully issued patents, including: US 61/944,304: System and Methods for Automated Detection of Application Vulnerabilities, Latifur Rahman Khan, Bhavani Marienne Thuraisingham, Just Sahs, Zhiqiang Lin, (U.S. Patent and Trademark Office (USPTO) (granted); US 8965974: Systems and methods for determining user attribute values by mining user network data and information, Satyen Abrol, Vaibhav Khadilkar, Latifur Rahman Khan, Bhavani Marienne Thuraisingham (U.S. Patent and Trademark Office (USPTO) (granted); and US 9,165,051: Systems and methods for Detecting a Novel Class, Mohammad Mehedy Masud, Latifur Rahman Khan, Bhavani Marienne Thuraisingham, Qing Chen, Jing Gao, and Jiawei Han, U.S. Patent and Trademark Office (USPTO) (granted).

17. My research interests include Data Mining/Machine Learning, Generative AI, Cyber Security, Big Data Analytics and Management, Semantic Web, Multimedia Information Management, Cloud Computing, Healthcare Analytics, and Database Systems.

18. I am an acclaimed global educator and scholar in the big data analytics area. I have served as a Distinguished Visitor of the IEEE Computer Society for 2021-2023 and ACM Distinguished Speaker, 2020 – 2022. With remarkable achievements in research and technology, I have served as Program Chair for several prestigious data analytics/mining conferences including IEEE International Conference on Data Mining (ICDM), one of flagship conferences in Data Mining and IEEE Big Data, flagship conference on Big Data.

III. The Level of Ordinary Skill in the Art

19. I understand that a person of ordinary skill in the art is a hypothetical person who has ordinary skill in the art to which the claimed invention relates.

Based on my experience, a person of ordinary skill in the art of computer science would have at least a bachelor's degree in electrical or computer science/engineering, or a related field, with at least six years of experience in the design or implementation of content management and analysis systems or a masters degree in electrical or computer science/engineering, or a related field,

with at least two years of experience in the design or implementation of content management and analysis systems. A higher level of education or skill can make up for less experience, and vice versa.

However, I understand that the Board found that a person of ordinary skill in the art at the time of the purported inventions of the '217 Patent would have had a bachelor's degree in electrical or computer engineering, or a related field, and two to three years of experience with web or email-based content management systems; a higher level of education or skill can make up for less experience, and vice versa.

Although the Board's definition of a person of ordinary skill in the art differs from the definition I had proposed, my opinions are the same under both definitions. In fact, because a skilled artisan under the Board's definition would be less skilled, that is even more reason why a skilled artisan would not be able to, for example, successfully combine the Kircher and Krug references to make an operable system.

For convenience, I may refer to a person of ordinary skill in the art as "one of skill in the art," "a person of skill in the art," "a person having ordinary skill in the art," "one of skill," "POSA," or similar terms.

IV. Abbreviations

20. For convenience, I will use the following abbreviations in this Declaration.

<u>Document/Proceeding</u>	<u>Abbreviation</u>
IPR2025-00299	IPR-299
U.S. Patent No. 7,716,217	the '217 patent
U.S. Patent Application Publication 2007/0016553A1	Dumais
WIPO Patent 2003/023650A2	Krug
U.S. Patent Application Publication 2003/0195937A1	Kircher
U.S. Patent Application Publication 2004/0260710	Marston

V. Legal Standards**A. Obviousness**

21. I understand that a patent claim is obvious if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

22. I understand that the obviousness analysis takes place at the time the patented invention was made. I understand that the relevant date for the '217

Patent is at least as early as June 7, 2005, and that, therefore, Dumais is not prior art to the '217 Patent. Nevertheless, for my analysis of obviousness with respect to the Dumais reference (Grounds 1-3), I have been asked to assume that the Dumais patent is prior art to the '217 patent, and that the relevant date for the '217 Patent is sometime between June 30, 2005, and January 13, 2006 (the filing date of the provisional patent that led to the issuance of the '217 Patent). My obviousness analysis relating to Dumais reference would be the same whether the relevant date is June 30, 2005, or January 13, 2006. For my obviousness analysis relating to the Kircher and Krug references (Grounds 4-5), I have applied the relevant date for the '217 Patent of at least as early as June 7, 2005. However, my obviousness analysis relating to the Kircher and Krug references would be the same whether the relevant date is June 7, 2005, or January 13, 2006.

23. I understand that as part of the obviousness analysis one must consider whether prior art teaches away from the claimed invention.

24. I understand that when an obviousness challenge is based on a combination of references one must consider whether there is a motivation to combine the teachings of those references. There must be some motivation, reason, or incentive that would cause one of skill in the art at the relevant time to combine the prior art in the way embodied by the patent.

VI. Claim Construction

25. I understand that claim terms should carry their “ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question” at the time of the invention. Unless otherwise stated herein, I have applied the ordinary meaning of such terms to one of skill in the art in light of the patents’ disclosure.

26. Dr. Houh argues that the “computer program modules” do not convey to a POSA a specific structure for performing the functions recited in the claim and, therefore, a POSA could not program any computer to perform the claimed functions. EX1004, ¶¶ 107-114. I disagree.

27. It is my opinion that a POSA would understand that “*monitoring module*,” “*first relevance measurement module*,” “*second relevance measurement module*,” “*relevance analysis module*,” “*content presentation module*,” and “*search module*” require structure.

28. For each module, the claim sets forth a sufficient structure to allow each component to perform its role in the invention. The structure may be in the form of software instructions. such as programs or code.

29. Claims 1 and 6 of the ‘217 Patent require storing a “*computer program*” or “*computer program modules*” on a “*computer-readable storage*

medium.” A POSA would understand the “*computer program*” or “*computer program modules*” stored on a “*computer-readable storage medium*” refers to software instructions or code, which, to a POSA, is structure.

30. The ‘217 Patent states that the “*monitoring module*” is “*configured to track actions by a plurality of users associated with an application for managing electronic content.*” By at least 2004, the use of software instructions (e.g., programs or code) to track use actions in systems for managing electronic content was known in the art. Monitoring by tracking use actions was a known feature of systems involving sent electronic content. At the time of the invention, there were existing or off the shelf systems that could provide this monitoring.

31. A POSA would recognize that the “*monitoring module*” in the claims requires implementing such structures. A POSA would be able to implement the claimed invention using known and available techniques.

32. The claims also discuss a “*relevance analysis module,*” which may have a sub-modules a “*first relevance measurement module*” and a “*second relevance measurement module.*” With respect to the “*relevance analysis module,*” “*first relevance measurement module,*” “*second relevance measurement module,*” the claims also contain sufficient structure for each module to do its intended job.

33. The claims state that the “*relevance analysis module*” is “*configured to determine the relevance score of the piece of electronic content sent from the sender to the user, the relevance score being determined based at least in part on the first determined measure of relevance and on the second determined measure of relevance.*” A POSA would recognize that software instructions (e.g., programs or code) are structure used to determine the relevance score.

34. The claims disclose sufficient structure for the “*relevance analysis module*” to determine a relevance score based at least in part on the first and second measures of relevance.

35. A POSA would be able to implement the “*relevance analysis module*” using known and available techniques. A POSA would recognize that the claims are directed to structure, not some “black box.”

36. The claims state that the “*first relevance measurement module*” is “*coupled to the monitoring module and configured to determine a first measure of relevance of the piece of electronic content based at least in part on one or more actions of the user on the piece of electronic content.*”

37. The claims state that the “*second relevance measurement module*” is also “*coupled to the monitoring module and configured to: identify at least one other of the plurality of users that is a recipient of the piece of electronic content*

and that is cognate to the user, and determine a second measure of relevance of the piece of electronic content” as based at least in part on one or more measures derived from the group consisting of: (1) “a local importance describing an importance of the sender to the user,” (2) “a global importance describing an importance of the sender within an organization with which the plurality of users are associated,” (3) “a content relevance determined responsive to content of the piece of electronic content,” and (4) “one or more actions on the piece of electronic content of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.”

38. The “coupling” of the modules to the monitoring module provides the relevance analysis modules with access to user actions. The claim explains how each “module” is engineered, built, or implemented to determine each relevance measurement. A POSA would recognize that software instructions (e.g., programs or code) are structure used to perform the necessary relevance determinations.

39. The claims also discuss a “*content presentation module.*” EX1001, Claim 2 & 13. The claims contain sufficient structure for the “*content presentation module*” to do its intended job.

40. The claims state that the “*content presentation module*” is “*configured to present the piece of electronic content to the user in accordance with the*

determined relevance score and to present to the user a value describing the determined relevance score.” A POSA would recognize that software instructions (e.g., programs or code) are structure used to present the piece of electronic content to the user in accordance with the determined relevance score and to present to the user a value describing the determined relevance score.

41. The claims disclose sufficient structure for the “*content presentation module*” to present the piece of electronic content to the user in accordance with the determined relevance score and to present to the user a value describing the determined relevance score.

42. A POSA would be able to implement the “*content presentation module*” using known and available techniques. A POSA would recognize that the claims are directed to structure, not some “black box.”

43. The claims also discuss a “*search module*.” EX1001, Claim 3 & 14. The claims contain sufficient structure for the “*search module*” to do its intended job.

44. The claims state that the “*search module*” is “*configured to search the electronic content in accordance with the determined relevance score.*” EX1001, Claim 3 & 14. A POSA would recognize that software instructions (e.g., programs

or code) are structure used to search the electronic content in accordance with the determined relevance score.

45. The claims disclose sufficient structure for the “*search module*” to search the electronic content in accordance with the determined relevance score.

46. A POSA would be able to implement the “*search module*” using known and available techniques. A POSA would recognize that the claims are directed to structure, not some “black box.”

47. For each relevance measurement “module,” the ‘217 Patent claims disclose sufficient structure to perform the required relevance measurement.

48. A POSA would be able to implement each “module” using known and available techniques. A POSA would understand that the claims are directed to structure, not some “black box.”

49. The provisional patent application contains an enabling disclosure of the invention. EX1003. With that disclosure in hand, and using tools and techniques that were known or conventional in the art by 2004, a POSA would be able to practice the claimed invention.

VII. Summary of Opinions

50. The opinions expressed in this Declaration are summarized below.

51. It is my opinion that claims 1-3, 5-9, 13-15, 18-19 and 22 of the ‘217 Patent are not obvious in view of Dumais.

52. It is my opinion that claims 1-22 of the ‘217 Patent are not obvious in view of Dumais and Marston.

53. It is my opinion that claims 1-3, 5-9, 13-15, and 18-22 of the ‘217 Patent are not obvious in view of Kircher and Krug.

54. It is my opinion that claims 4, 10-12, 16-17, and 20-21 of the ‘217 Patent are not obvious in view of Kircher, Krug, and Marston.

VIII. The ‘217 Patent

55. The ‘217 Patent is entitled “Determining relevance of electronic content.”

56. One of the problems addressed in the ‘217 Patent is the volume of email, including that “many email users receive hundreds of different emails a day.” EX1001, at 1:21-27. Even after weeding out “junk” mail, users “must still take the time to go through those emails to determine which ones are more important than others.” EX1001, at 1:28-34.

57. The ‘217 Patent explains that solutions that came before failed to solve the problem. In typical email applications, in order to find the important

emails, users were forced to mine through email using “unintelligent mechanisms (e.g., keyword, sender, recipient, and/or date range searches).” EX1001, at 1:40-44.

58. To address this problem, the ‘217 Patent determines a “relevance score” for each “piece of electronic content that is sent from a sender to a user.” EX1001, at Claims 1, 6, 7.

59. In determining the “relevance score” of a piece of sent electronic content, the ‘217 Patent tracks not only actions by a single user on the communication, but also “track[s] actions by a plurality of users.” EX1001, at Claims 1, 6, 7. The ‘217 Patent refers to these actions of other users as part of the “communal elements of the system.” EX1001, at 8:34-36. The claims of the ‘217 Patent all require “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” EX1001, at Claims. “[O]ne or more embodiments ... may determine the relevance and/or importance of an instance of electronic mail based on ... other user actions (e.g., what did other users do with that piece of electronic mail).” EX1001, at 3:36-42. “Users’ actions **86** represent the ways users interact with the electronic mail system, e.g. reading mails, replying to mails, changing settings” and encompass “other users’ actions.” EX1001, at 8:32-35. “[B]y monitoring a collection of user actions and then performing an analysis of those actions, valuable

information may be learned for subsequent use in an electronic mail application in accordance with one or more embodiments.” EX1001, at 6:18-23. “The electronic mail system **250** has a monitoring module **252**, which generally monitors and registers user actions **and those [actions] of users associated or corresponding with a particular user.**” EX1001, at 6:39-42.

60. The system also tracks the first user’s actions, including, but not limited to: “a user composes an electronic mail object; a user reads an electronic mail object; a user forwards an electronic mail object; a user replies to an electronic mail object; a user deletes an electronic mail object; a user files an electronic mail object in a custom folder; a user prints an electronic mail object; a user saves a local copy of an electronic mail object; a user copies an electronic mail object to their clipboard; a user links an electronic mail object (or part of a submessage) to a context; a user finds an electronic mail object as part of a search; a user includes an electronic mail object in a visualization; a user opens or saves an attachment; and a user forwards an attachment.” EX1001, at 11:10-23.

61. The ‘217 Patent determines relevance and importance values by monitoring users’ actions. EX1001, at 6:1-3. “Such monitoring may occur as part of an automatic, background process. As will be apparent from the description herein, users’ actions may indicate valuable information about both content and

entities in the system. For example, if a user receives an electronic mail object, saves the electronic mail in a custom folder and subsequently forwards it to three other users, then the electronic mail is likely to be much more relevant to those users than if the sending user had just deleted the electronic mail as soon as he or she had finished reading it.” EX1001, at 5:11.

62. The “*relevance score*” is determined based on two separate measures of relevance. EX1001, at Claims 1, 6, 7 (“*the relevance score being determined based at least in part on the first determined measure of relevance and on the second determined measure of relevance.*”).

63. The “*first measure of relevance*” is “*based at least in part on one or more actions of the user on the piece of electronic content.*” EX1001, at Claims 1, 6, 7; *see also* EX1001, at 5:45-48 (“an electronic mail relevance application helps users make sense of vast quantities of electronic mail by inferring a user's interest in content and other users based on **monitoring that user's actions** with in the application.” (emphasis added). This measure looks at “what did the user do with that piece of electronic mail” (EX1001, at 3:40), such as “reading mails, replying to mails, changing settings.” EX1001, at 8:32-34.

64. The “*second measure of relevance*” is “*based at least in part on one or more measures derived from the group consisting of: [i] a local importance*

describing an importance of the sender to the user, [ii] a global importance describing an importance of the sender within an organization with which the plurality of users are associated, [iii] a content relevance determined responsive to content of the piece of electronic content, and [iv] one or more actions on the piece of electronic content of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.”

EX1001, at Claims 1, 6, 7.

65. The “*local importance*” measure focuses on the “*importance of the sender to the user.*” EX1001, at Claims 1, 6, 7. For example, “it is likely that a user's direct manager will be important to the user because the user will typically read messages from their manager in a timely manner, will often reply to those messages, and will send their manager a significant number of electronic mail objects.” EX1001, at 6:12-17.

66. The “*global importance*” measure focuses on the “*importance of the sender within an organization with which the plurality of users are associated.*” EX1001, at Claims 1, 6, 7. Specifically, “users’ actions ... reflect how significant a given entity is to a given user or set of users.” EX1001, at 8:46-47.

67. “[*A*] *content relevance*” measure is “*determined responsive to content of the piece of electronic content.*” EX1001, at Claims 1, 6, 7. “Relevance **84** may

have as inputs the mail data **80** (properties of **the content** in question)....”

EX1001, at 8:58-59.

68. The final measure that makes up the second measure of relevance is “*one or more actions on the piece of electronic content of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” EX1001, at Claims 1, 6, 7.

69. The ‘217 Patent explains that users themselves can provide feedback: “users may themselves rate various aspects and entities in the system to improve an accuracy of the relevance analysis engine. For example, a user may provide feedback regarding the relevance of any given piece of content, and/or the user may provide feedback regarding the importance of any given entity. Moreover, a user may also change various weighting factors used to determine settings of the relevance analysis engine, where such settings may otherwise be self-adjusting.” EX1001, at 7:64-67.

70. The ‘217 Patent involves systems and methods relating to person-to-person communications. For example, every claim of the ‘217 Patent requires electronic communications, including “*a sender,*” a “*sent*” “*piece of electronic content,*” and a “*recipient.*” EX1001, Claims 1, 6, 7. The ‘217 Patent describes that electronic mail (e-mail) is one type of “*piece of electronic content.*” EX1001, at

3:43-44. However, the ‘217 Patent recognizes that its embodiments “may be applicable to other forms of electronic messages and content,” including other types of communications, such as “instant message (IM) communications and/or short message service (SMS) messages.” EX1001, at 3:48-51.

71. The ‘217 Patent is focused on how different users interact with the same piece of sent electronic content. For example, every claim of the ‘217 Patent requires tracking the actions of multiple users with respect to those electronic communications. EX1001, Claims 1, 6, 7 (“*track[ing] actions by a plurality of users associated with an application for managing electronic content*”). In order to do so, every claim of the ‘217 Patent requires “*identify[ing]*” at least one other “*recipient*” of the same piece of electronic content. EX1001, Claims 1, 6, 7.

72. The systems and methods claimed in the ‘217 Patent require “*identify[ing]*” other users that are “*cognate*” to the first user – e.g., “other users considered to be the most similar to the user concerned.” EX1001, at 33:58-62; *see also* EX1001, at 17:10-14 (“the relevance analysis engine may allow for the determination of similar or ‘cognate’ entities and users by automatic analysis of users’ actions”); *id.* at 42:62-63 (a cognate group consists of “users most similar to a given user/recipient”).

73. The ‘217 Patent allows for the determination of relevancy at least in part based upon the actions of other users that are “*cognate*” to the first user. For example, every claim of the ‘217 Patent states that one measure that can be used to determine the second measure of relevancy is “*one or more actions on the piece of electronic content of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” EX1001, at Claims 1, 6, 7. “Cognate importance is based on purposefully biased samples, but still involves the views of a significant number of individuals rather than just one user.” EX1001, at 37:12-14.

74. In order to determine a relevancy score, the ‘217 Patent identifies other recipients that received the same piece of electronic content and then monitors “the direct actions of the cognate group on this particular electronic mail object.” EX1001, at 36:29-31; EX1001, at Claim 1 (“*second measure of relevance*” can be based upon “*one or more actions on the piece of electronic content of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user*”); EX1001, at 36:59-62 (“[I]t may be particularly useful to a given user to know what, for example, cognate users, have done with the electronic mail object soon after it arrives.”).

75. The ‘217 Patent also monitors “*cognate*” users to determine “how the cognate group in general has rated the sender[.]” of a piece of electronic content. EX1001, at 36:28-29; EX1001, at Claim 1 (“*second measure of relevance*” can be based on “*a global importance describing an importance of the sender within an organization with which the plurality of users are associated*”).

IX. The ‘217 Patent Specification Discusses Why Its System Needs to “identify ...” a Second User That Is Both “a recipient” and also Is “cognate to the [first] user.”

76. A requirement of every claim of the ‘217 Patent is the requirement to “*identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” EX1001, at Claims.

77. In the ‘217 Patent, “*identify[ing]*” a second “*user*” that is both “*cognate*” and a “*recipient*” is one of the steps required for assessing “*determining a relevance score of a piece of electronic content.*” EX1001, at Claims.

78. The ‘217 Patent discusses why it imposes this “*identify ...*” requirement in every claim.

79. First, the ‘217 Patent explains that “*identify[ing]*” other “*recipients*” is important because the actions of other “*recipients*” can help determine “the relevance of content in a given user’s folders.” EX1001, 12:27-30. For example, if “most of the recipients reply to the electronic mail object, forward the electronic

mail object, and/or copy the electronic mail object to custom folders, the electronic mail object is **more likely to be generally or globally relevant** than if the recipients immediately deleted the electronic mail object.” EX1001, 12:35-41. In contrast, **“if most other recipients of an electronic mail object delete it** as soon as it arrives in their ‘inbox,’ then the recipient in question will probably not find the content particularly relevant.” EX1001, 12:41-44.

80. **Second**, the ‘217 Patent explains why identifying “*cognate*” users is important:

In regard to recognizing “cognate” entities are referred to above, an electronic mail system in accordance with one or more embodiments may identify a “cognate group” for a user, based on historical actions. More particularly, for each user, over time, the system may identify **a cognate group** of the n other users regarded as most similar. Such a group may be defined by similar past user actions and assessments, and/or a direct input by a user. ...Accordingly, it may be assumed in certain instances that **the actions of this particular group on an electronic mail object will give more indication of its relevance to the user than would a global reaction to the electronic mail.**

EX1001, 14:59-15:11.

81. **Third**, the ‘217 Patent explains that its “relevance analysis engine” uses information about the users in the “*cognate*” group to calculate values, including:

7. Cognate Relevance Value: a cognate relevance value is a relevance score for a piece of content respective to a given recipient based on a weighted average of the IRC's of the n users considered to be the cognate group for that recipient. [symbol: ${}^xR_r^c$ for the relevance input from the cognate group c of recipient r , on electronic mail object x sent by senders $\{s\}$ to recipient r]
8. Cognate Importance Value: a cognate importance value is an importance score for an entity respective to a given user, based on a weighted average of the IIC's of the n users considered to be the cognate group for that recipient. [symbol: I_{sr}^c for the sender s to recipient r in cognate group c]
- ...
11. Local Relevance: a local relevance value is the relevance value for a piece of content to a given user that is shown to this user through the interface; it is a function of the user's own IRC, the global and cognate relevance scores, and the combined importance relating to that mail. [symbol: ${}^xR_{\{s\}r}^1$ for content x sent by senders $\{s\}$ to recipient r]

EX1001, 25:37-26:52. As shown by the emphasis added above, calculating each of these “values” requires that the system first “*identify*” the first user’s “*cognate*” group.

82. **Fourth**, the ‘217 Patent teaches that whether the “*cognate*” group finds a sender to be important is taken into consideration when determining “importance”:

Still further, as described above, **the importance of the sender to the cognate ... group** within which a recipient is located may be

considered. Accordingly, this means that there may be at least three factors for consideration as to importance:

...

3. I_{sr}^c is the “cognate importance” of the sender to a particular recipient, which is the sender's importance to the cognate ... group within which the recipient is located. This may be thought of as a more focused element of communal importance than the global importance, which is universal.

EX1001, 29:59-30:15.

83. **Fifth**, the ‘217 Patent teaches that both the actions the “*cognate*” group and also the actions of all the other “*recipients*” on the electronic mail object are taken into consideration when determining relevance value:

Additionally, it is noted that an aim of one or more embodiments is to produce a “good” figure for local relevance, which is the relevance value seen by the recipient when they are browsing through the interface. The system offers a rapid effect of actions on the mail of (in, for example, decreasing order of importance and so rapidity of change): the actions of user r him/herself on electronic mail object x ; **the actions on the electronic mail object x of the group cognate to r** ; and **the actions of all the other recipients** on the electronic mail object.

EX1001, 36:33-41.

84. **Sixth**, the ‘217 Patent teaches that “actions of those in [a user’s] cognate group” is one of the factors used to calculate each user’s local importance values:

Calculation of each user's local importance values for other entities is based on their own actions, and also **actions of those in their cognate**

group. An individual importance component value (IIC) or individual value inputting into the cognate importance component (I_{sr}^c) may be assigned when a user has interacted with an entity.

EX1001, 44:64-43:3.

85. **Seventh**, the ‘217 Patent teaches that “a cognate relevance value is now input into the final figure for local relevance,” which “**is based on the actions of those in the group cognate** to the recipient on the particular electronic mail object.” EX1001, 43:4-7.

86. **Eighth**, the ‘217 Patent teaches that “[a]s to communal filtering, this mechanism may **use the behavior of other recipients** of a given piece of content to determine the content's relevance to the user in question—communal relevance.” EX1001, 43:61-64 (emphasis added).

87. For all of these reasons, the specification explains that the purpose of “*identifying*” a second user that is both “*a recipient of the piece of electronic content*” and also “*is cognate to the user*” is for the purpose of tracking that second user’s actions to assist in determining a relevancy score for a piece of electronic content.

X. Mathematics Disclosed in ‘217 Patent to “*identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*”

88. The ‘217 Patent teaches the math needed in order to “*identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*”

89. The system describes a process to analyze the relevance of electronic mail objects to the receiver with respect to the sender of the respective mail objects. **EX1001**. Regarding this concept, the ‘217 Patent defines the following components to analyze the relevance. **EX1001**.

90. The patent defines a layered framework for computing importance and relevance of electronic mail. At the base are Mail Data Components (MDC), inherent features like flags or recipients. **EX1001**, 25:40-45. User behavior drives two individual scores: Individual Relevance Components (IRC) (*id.* 25:45-49), reflecting how a user interacts with a content, and Individual Importance Components (IIC) (*id.* 25: 50-54), reflecting how important an entity is to that user, based on the actions of that user. So, IRC pertains to mail object with respect to a user and the IIC pertains to an entity such as a sender or job code with respect to a user. The global Importance averages IICs across the system (*id.* 25: 55-58), and Global Relevance averages IRCs weighed by global importance (*id.* 25:59-64).

91. To capture personalization, each user has a Cognate Group of similar users, leading to Cognate Relevance and Cognate Importance based on group averages. The system identifies these cognate groups for each of the users individually based on the past actions of the user in question (*id.* 25:65: 26:10). This group contains n other users who are considered most similar based on their past action or historical data. Here, each user is assigned to one or many cognate groups which are dynamically determined. It is also not mandatory that the users in the system are divided into mutually exclusive cognate groups. Rather, these groups are updated over time based on user's action for which the system determines the most similar collection.

92. Now, these values feed into Local Importance (*id.* 26: 24-30), the user-specific importance of a sender, combining IIC, cognate, and global importance (*id.* 29: 64--30: 15). For multi-sender threads, Combined Importance aggregates local importance across all contributors (*id.* 26: 51-52). So, the Local Relevance shown in the interface blends a user's own actions (IRC), global and cognate relevance, and combined importance, giving a personalized, socially aware measure of how much an email matters.

93. Now, to compute the Individual Importance Component (IIC) for a sender, the system evaluates significant local user actions on past emails, applying

a time-based weighting so that recent actions count more. Key factors include: (1) the percentage of unsolicited emails deleted or stored unopened, reflecting disengagement which is quantified using the following function

$\frac{1}{n_s} \sum_{x=1}^{n_s} f^t(\text{del}_x, \text{no}_x)$ (eq. 1 [31: 30-35]); (2) the attention ratio, measured as the time spent reading an email relative to its length, averaged over opened messages and defined as the following $\frac{1}{m_s} \sum_{x=1}^{m_s} f^t\left(\frac{t_x}{L_x}\right)$ (eq. 2) [31: 40-45]; and (3) any past relevance scores explicitly assigned by the user to emails from that sender, which decay in influence over time and is defined as $R_{rs}^{\text{assigned}} = \sum_{x=1}^v f^t(R(T_x))$ (eq. 3) (id. 31: 60). This can also be extended to incorporate user-assigned importance values, defined as $f^t(I_{rs}^{\text{assigned}})$ for broader entities. Taking all these components into account the IIC now can be calculated as following (eq. 4) (id. 32:30-35):

$$IIC_{sr} = w_1 \frac{1}{n_s} \sum_{x=1}^{n_s} f^t(\text{del}_x; \text{no}_x) + w_2 \frac{1}{m_s} \sum_{x=1}^{m_s} f^t\left(\frac{t_x}{L_x}\right) + w_3 \sum_{x=1}^v f^t(R(T_x)) + w_4 f^t(I_{rs}^{\text{assigned}}) \dots \dots (eq. 4)$$

94. Using this value, the system can begin computing global importance value, which can be a weighted aggregate of the IICs, such as

$f\left(\sum_{r=1}^n f\left(IIC_{sr}^{(k-1)}; I_r^g\right)\right)$ (eq. 5) (id. 32: 60-65). Here, k-1 is the global value in

the previous period of calculation for this value and I_r^g is the global importance of

the recipient. An additional element of the calculation is related to the receipt of mail objects from a more important sender, which increases the importance of the recipient. This can also be used to identify shared importance based on who are the other recipient of the same mail object. This can be a function of number of mail objects received and a weighted average (size m ; where m is the number of recipients of the same mail object sent by the important sender) of value shared importance. This component can be calculated as a function of both these elements,

$$f\left(\sum_{j=1}^m \frac{(k-1)I_s^g}{N_j}; \frac{1}{m} \sum_{j=1}^m \frac{(k-1)I_s^g}{N_j}\right) \dots\dots(eq. 6) (id. 33:11-18)$$

as described by the above function (eq. 6). Here, the second term is the weighted average of the shared importance. Now, considering all these components in computing Global Importance, the system can incorporate directly assigned values from organizational authorities such as Human Resources, where interventions may be fixed at a given time. Overall, the global importance update mechanism adjusts each sender's importance score at iteration k based on the prior value ($k-1$) can be calculated as the following (eq. 7) with α indicating how much the value should change with time:

$$I_s^{g,(k)} = \alpha I_s^{g,(k-1)} + (1 - \alpha) \left[w_1 f \left(\sum_{r=1}^n f(IIC_{sr}^{(k-1)}; I_r^g) \right) + w_2 f \left(\sum_{j=1}^m \frac{(k-1)I_s^g}{N_j}; \frac{1}{m} \sum_{j=1}^m \frac{(k-1)I_s^g}{N_j} \right) + w_3 f({}^oHR_s^l) + w_3 f({}^oHR_s^p) \right] \dots\dots(eq. 7)$$

Id. 33:40-50.

95. Additionally, using the individual IIC for each of the cognate groups, the cognate importance for a particular sender can be calculated. In such cases, the value can be derived from the available components, while assigning a reduced weight to it in the final local importance calculation, $I_{sr}^c = \frac{1}{n_c} \sum_{i=1}^{n_c} f(IIC_i)$ (*eq. 8*) (*id.* 34: 5-10), where n_c is the count of non-zero IICs in the cognate group. So, The Local Importance of a sender to a given recipient is computed as a function of three factors (*id.* 34:18-24):

- (1) *the Individual Importance Component (IIC)*, reflecting the recipient's own actions toward that sender,
- (2) *the Cognate Importance (I^c)*, derived from the IICs of users in the recipient's cognate group, and
- (3) *the Global Importance (I)*, based on the organization-wide values determined in the latest system review.

The local importance here depends on the cognate importance or other

similar users, as well as the global importance in the system. This is different

from frameworks which do not consider the effect of the group on a particular user.

This framework can be expressed as the following (*eq. 9*) which considers the values calculated in *eq. 4*, *eq. 8*, and *eq. 7*:

$${}^k I_{sr}^1 = f \left(IIC_{sr}^{(k-1)}, {}^{(k-1)} I_{sr}^c, {}^{(k-1)} I_s^g \right) \dots \dots (eq. 9)$$

Id. 34:25.

96. Finally, the system also explains that global importance changes slowly, reflecting long-term organizational perception of an entity, with adjustments typically made through periodic reviews or queued updates, while new entities may change more quickly. Cognate importance evolves faster than global values, as it reflects averages across a user's cognate group, and local importance is the most responsive, adjusting at run-time to user actions but stabilizing once sufficient history exists (*id.* 36: 12-67). For relevance, global values also update moderately, more rapidly for newer content, whereas cognate relevance is recalculated more frequently and serves as the most immediate guide for prioritization. Local relevance combines personal, cognate, and global signals, updating dynamically with user actions and through periodic refreshes. Together, this hierarchy ensures that recent interactions and new content are reflected quickly, while established patterns change more gradually.

XI. The Alleged Prior Art**A. Dumais**

97. Dumais is titled “Sensing, Storing, Indexing, and Retrieving Data Leveraging Measures of User Activity, Attention, and Interest.” EX1006.

98. Dumais describes a data manipulation system comprising one or more data items. EX1006, [Abstract]. Dumais discloses that data items that can be searched and retrieved include “documents, files, email messages, calendar appointments, web pages, sub-sections within the data items or cross-item abstractions.” E.g., EX1006, [0031].

99. Dumais uses associated tags, which capture a user’s interactions with or attention to these items. EX1006, [Abstract]. These tags can represent various user engagement metrics, such as the last access time, the total number of times an item has been accessed, the frequency of access over a defined past period, or the frequency within one or more arbitrarily specified time frames. EX1006, [0031].

100. The focus in Dumais is on how data is retrieved in response to a search. E.g., “Sensing, Storing, Indexing, and **Retrieving Data** Leveraging Measures of User Activity, Attention, and Interest.” EX1006 (emphasis added); EX1006, at Abstract (discussing “items returned in a search”). The system employs

an information retrieval architecture that processes user activity data. EX1006, [0040].

101. A personalization component integrates a user model based on user interactions and incorporates processing mechanisms, such as retrieval algorithms adapted according to the user model. EX1006, [0040]. This component refines search results by modifying either the search query and/or the returned results. EX1006, [0040].

102. A user interface facilitates query generation and receives modified or personalized results based on adjustments made by the personalization component. EX1006, [0040].

103. In Dumais, “query modification” encompasses both changes to query terms and alterations in the algorithm used to match queries with documents, ensuring more personalized search results. EX1006, [0040]. Query modification ensures that a subset of items is delivered to a user in a specific order or ranking.

104. Ranking in Dumais is a two-step process. First, after query modification and submissions to a search engine and results will be returned from the search engine; and second, the returned results are modified through “query modification.” EX1006, [0040]. The “query modification” in Dumais is focused on a single user, including a single user’s interest, via tags. EX1006, [0040].

B. Kircher

105. Kircher is entitled “Intelligent Message Screening.” EX1007.

106. Kircher discloses a computer program for managing and prioritizing electronic messages. EX1007, [Abstract]. An electronic message is sent by the sender, and upon receipt, the recipient can take various actions. There are four possible actions for a specific email message:

- (a) The recipient is expected to read, reply to, and save the email.
- (b) The recipient is expected to read and save the email.
- (c) The recipient is expected to only save the email.
- (d) The recipient is expected to delete the email without reading it.

EX1007, [0053]. The patent classifies these actions (EX1007, [0053]) and introduces a method for ranking electronic messages based on their classification. E.g., EX1007, [0092]. This ranking is determined using fuzzy logic, which categorizes each message based on measurable attributes and user-defined parameters. E.g., EX1007, [0092].

107. The evaluation of each message with respect to the recipient is determined by three key factors:

1. Sender Importance – Assessed based on:
 - Whether the sender’s address is in the recipient’s address book.

- Whether the sender is an individual.
 - Whether the message is a newsletter.
 - Whether the message includes a nickname, phone number, or company name found in the recipient's address book.
2. Degree of Personalization – Evaluated based on:
- Whether the message is addressed solely to the recipient.
 - Whether it was sent to additional recipients.
 - Whether the sender is an individual.
 - Whether the message includes a personalized greeting matching the recipient's friendly name.
 - Whether it contains a personalized signature matching the sender's friendly name.
3. Content Importance – Determined based on:
- The presence of spam indicators or newsletter characteristics.
 - The message length exceeding a specified threshold.
 - Inclusion of a personalized greeting or signature.
 - Presence of keywords that are not among predefined keywords.

- Inclusion of a nickname, phone number, or company name from the recipient's address book.

EX1007, [0014], EX1007, [0016-0018].

108. Fuzzy logic is first applied individually to evaluate the criteria of sender importance, degree of personalization, and content importance. EX1007, [0015]. It is then used to generate a single numerical value representing the overall ranking of the message's importance based on all evaluated factors. EX1007, [0015]. Furthermore, fuzzy rules (weights) are updated whenever an actual user action differs from the expected user action determined by the email message ranking. EX1007, [0046].

C. Krug

109. Krug focuses on identifying relevant objects for users on the Internet. EX1008, [0002]. Relevance is determined by calculating the Euclidean distance between object and user profiles. EX1008, [0022]. Here, objects can include documents such as HTML pages, with their properties or content serving as object profiles. EX1008, [0006].

110. User profiles are represented as attribute-value pairs, typically containing demographic information. EX1008, [0011]. A user profile is a model of the user or a user group that describes his or her characteristic properties, for

example, in the form of socio-demographic data such as age, gender or place of residence, or his or her behavior. EX1008, [0011].

111. The user profile may also be structured hierarchically, wherein one aspect of the profile is represented in a refined manner by associated sub-aspects. EX1008, [0014]. A hierarchical structure of the user profile makes it possible to provide a more accurate model of the user if sufficient data is available and to use a more general description of the user properties if the data is less meaningful. EX1008, [0014].

112. Since the object profile describes the properties of a typical user of the object, a high level of similarity between the user profile and the object profile can be used to conclude that the object is highly relevant for the respective user. EX1008, [0020]. For example, if an object is often used by the corresponding user or by users with similar object profiles, the user profile and the object profile are similar, and correspondingly Euclidean distance between the user profile and the object profile will be zero (minimum). EX1008, [0020].

113. The specific and absolute usage intensities can be used when updating the profiles to determine the influence of the interaction on the profile and/or to determine the comparison values of the objects when determining the relevant criteria. EX1008, [0034].

114. The intensity factor describes the usage intensity of an object by the user that describes the usage behavior of users as an elementary variable of the system. EX1008, [0068]. The patent utilizes two factors such as the intensity factor of a usage and the absolute usage intensity for an object. Here, on one hand, the intensity factor refers to the current interaction. EX1008, [0068]. On the other hand, the absolute usage intensity aggregates all interactions of a user for an object. EX1008, [0068].

115. The intensity factor for an interaction is determined by analyzing the user's interaction, taking into account the actual active time for interaction with the object and/or the user's rating of the object. EX1008, [0069]. To assess interaction intensity, the system records the strength of a user's engagement with an object. The user's computer tracks the top ten objects with the highest interaction intensity, storing their corresponding intensity values along with object identifiers (e.g., URLs). EX1008, [0102].

116. A user profile consists of both a static and a dynamic component. EX1008, [0056]. These profiles serve as the foundation for group and object profiles. The static portion is established during registration and the creation of virtual identities. EX1008, [0057]. The dynamic portion shares the same aspects as the static part but evolves over time. Initially, the values of the dynamic profile are

neutral, reflecting equal influence. EX1008, [0059]. However, each interaction, such as document usage, dynamically impacts the profile, either strengthening or weakening specific aspects of the static portion. EX1008, [0059].

117. An average user profile for a given object is derived from the profiles of users known to engage with it. EX1008, [0081]. The object profile follows the same structure as user profiles, representing a typical user based on their profile attributes, as well as the frequency and intensity of usage. EX1008, [0081].

118. A critical component of Krug's formula is the calculation of the **initial priority** of objects. E.g., **EX1008**, [0107]. This priority is determined by **search engine** results, which are external to the system and specific to a given search query, **EX1008**, [0115] ("An initial priority of the object is determined based on the search engine results for the search query."). The initial priority (GR) is a function of two parameters: the weight assigned to the search engine and the rating of the object as calculated by that engine. **EX1008**, [0115]. Each search engine is assigned its own weight — $Sg^{(1)}$, $Sg^{(2)}$, ... $Sg^{(S)}$ — which may be set manually or dynamically. **EX1008**, [0116].

119. For each object, a priority rating $Rz(i)$ is generated. **EX1008**, [0119]. Based on this rating, the objects are ordered, and their initial priorities are

established. The initial priority rating of an object is defined as follows: $GR_z^{(i)} = \text{pr}(R_z^{(i)}, Sg^{(i)})$. **EX1008**, [0121].

120. Here, the function increases with both parameters. **EX1008**, [0121]. If the same object appears in the hit lists of multiple search engines, its initial priority may be determined either by taking the highest priority value from those lists or by averaging all of them. **EX1008**, [0122].

121. In summary, the calculation of the initial priority — which is then used in calculating the final comparison between an object's profile and a user's profile — relies on external search engines. The score an object receives in a search engine's hit list, along with the weight assigned to that search engine, directly influence the outcome. Thus, a strong initial priority depends both on the object achieving a high rating from the search engine and on the engine itself being assigned a higher weight.

D. Marston

122. The Marston reference cited by Petitioner is U.S. Patent Application Publication 2004/0260710, titled "Messaging system." The messaging system in Marston uses a relational model to represent messages exchanged among end-users of the system. **EX1043**, [Abstract]. In Marston, a relationships module describes the relationships among messages and submessages. **EX1043**, [Abstract]. The

messaging system stores each object only once, thus significantly reducing infrastructure costs by removing unnecessary duplicity. EX1043, [Abstract].

XII. Opinions Regarding IPR-299 (U.S. Patent No. 7,716,217)

123. In the paragraphs below I detail the bases for my opinions relating to IPR-299. I address each ground of invalidity asserted by the petitioner in IPR-299.

A. Grounds 1-2: Claims 1-3, 5-9, 13-15, 18-19 and 22 of the ‘217 patent are not obvious based on Dumais (with or without AAPA)

1. Differences Between Dumais and the ‘217 Patent.

124. The inventions in the ‘217 Patent are very different from the invention in Dumais, in many ways.

125. One way in which Dumais and the ‘217 Patent differ is that Dumais is primarily used for query modification. If there is no query, Dumais does not apply. In contrast, the ‘217 Patent focuses on assigning a relevance score to inter-person communications, such as emails and other types of sent messages. The ‘217 Patent assigns a relevance score to content in the absence of any query. Although Dumais mentions email in passing (as a type of document that can be queried), communications are not the focus of Dumais. For example, unlike the ‘217 Patent, Dumais does not focus on the importance of the “sender” or identifying “recipients.”

126. Another difference between Dumais and the ‘217 Patent is that the focus in Dumais is on a single user (user centric) at a time, whereas the ‘217 Patent focuses on inter-person communications and cognate users.

127. Another difference between Dumais and the ‘217 Patent is that Dumais does not incorporate a relational model for objects or items, whereas the ‘217 Patent emphasizes a relational model specifically for email messages. Dumais also does not consider sub-messages. Sub-messages introduce additional challenges—such as management and search—that are entirely ignored in Dumais’ approach.

128. Another difference between Dumais and the ‘217 Patent is in the way that groups are formed. In Dumais, the group is not predefined but formed based on similarity measures, such as correlation coefficients, vector-based similarity calculations, and statistical Bayesian methods. In contrast, the ‘217 Patent forms a group of users who are recipients of a given piece of electronic content and are cognate to a targeted user. Here, the primary factor determining group formation is the relationship between recipients and the electronic content.

129. Another difference between Dumais and the ‘217 Patent is in the level of detail provided. The ‘217 Patent discloses a multi-dimensional relevance system that evaluates the importance of each message based on user actions, collaborative

user interactions, and administrative settings. In the ‘217 Patent, several equations are introduced to model message importance, with the Gauss-Seidel algorithm employed to solve them. EX1001, 28-37. This approach is presented in a detailed and structured manner, without reliance on vague explanations. In contrast, Dumais lacks similar technical depth, often relying on broad, less-defined descriptions. For instance, the scope of “items” in Dumais' patent is very broad.

130. Another difference between Dumais and the ‘217 Patent is that Dumais employs a two-step process, which differs from the approach in the ‘217 Patent. Unlike Dumais, the ‘217 Patent does not incorporate query rewriting, a key component of Dumais' method.

2. Dumais Does Not Teach, Disclose, or Render Obvious the Limitation of “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*”

131. Dr. Houh opines that “Dumais discloses or renders obvious “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” EX1004, ¶ 240. I disagree. Dumais does not teach or disclose this limitation, and it would not have been obvious to add this limitation to the invention in Dumais.

132. Dr. Houh opines that “[a] POSA would have understood that a document with ‘past interaction[s]’ would indicate that another user ‘*is a recipient of the piece of electronic content.*’” EX1004, ¶247. I disagree.

133. It is apparent that Dr. Houh is defining “*recipient*” to be any user that “interact[ed]” with, or “used,” a data item. EX1004, ¶¶ 245, 247. That definition is incorrect. A POSA would understand that, in the ‘217 Patent, “*a recipient*” is another user that **received** a piece of **sent** electronic content from a **sender**. EX1001, at 2:26-28 (“an electronic mail object may be **sent to** external **recipients**”); EX1001, at 5:1-2 (same); EX1001, at 5:3-5 (“a user ... **sends** ... **to recipients**”); EX1001, at 5:12-14); EX1001, at 5:21-23); EX1001, at 10:15-18 (discussing whether a user was “one of fifty other **recipients**” or “the sole **recipient**”). Thus, a POSA would understand that, in the ‘217 Patent, a “*recipient*” is a user that received a sent piece of electronic content from a sender; not just any user that interacted with, or used, a piece of electronic content.

134. Every claim of the ‘217 Patent includes the requirement to “*identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” EX1001, at Claims. This requires not just that another “*user*” be identified, but also requires that the other “*user*” being identified must be **both** (1) “*a recipient*” and (2) “*cognate to the user.*”

135. Dumais does not teach or disclose the requirement to “*identify ... a recipient*” EX1004. In particular, there is no discussion in Dumais that the system or method must be able to “*identify ...a recipient*” – i.e., another user that received the same piece of sent content from the same sender that a first user received. EX1004.

136. A bigger problem with Dr. Houh’s analysis is that Dr. Houh does not even address the verb in the claim limitation “*identify*...*a recipient*.” When discussing the “*recipient*” limitation and Dumais, Dr. Houh does not analyze the verb “*identify*” at all. EX1004, ¶ 245 (“because the “[s]imilarity computations can be based on the content and/or **usage of items**” a POSA would have understood that at least one user “*is a recipient of the piece of electronic content*” because for collaborative filtering to function the users must have similar usage of items.”); EX1004, ¶ 247 (“POSA would have understood that a document with “past interaction[s]” would indicate that another user “*is a recipient of the piece of electronic content*.”). Dr. Houh’s analysis does not cite to **any** prior art reference to supply the “*identify* ... *a recipient*” limitation, and there is no reference that does. The system in Dumais does not attempt to “*identify*” such “*recipients*” as part of “*determining a relevance score of a piece of electronic content*.” Dr. Houh’s

failure to even address the requirement to “identify ... *a recipient*” shows that Dumais does not render obvious any claim of the ‘217 Patent.

137. Moreover, even if Dr. Houh were correct that collaborative filtering in Dumais somehow satisfies the “*recipient*” limitation, nothing in Dumais teaches or suggests the desirability of “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content*” – i.e., the desirability of “*identifying*” a second user that received the same piece of content as the first user. Instead, in Dumais, the purpose of collaborative filtering is to create profiles for users that are new to the system.

138. The “*identify*” limitation requires not only that the second “*user*” be a “*recipient*,” but also that the “*user*” be “*cognate to the [first] user*.”

139. Dumais does not teach or suggest a need to “*identify*” another user that is “*cognate to the [first] user*” and “*a recipient*.”

140. Nothing in Dumais shows an appreciation of the desirability of, or mathematics required to, “*identify*” another user that is “*cognate to the [first] user*.”

141. The ‘217 Patent requires that the “*at least one other of the plurality of users*” being “*identif[ie]d*” must be “*cognate to the user*.” The reference to “*the user*” refers to the first user that is doing the searching (i.e., the user for which

relevancy is being determined), and the second user being identified must be “cognate to the [first] user.” Dumais, however, does not discuss “identify[ing]” a second “user” that is “cognate to the [first] user” and “a recipient.” Dumais also does not discuss the desirability of “identify[ing]” a second “user” that is “cognate to the [first] user.”

142. Dumais focuses only on the target user (the user doing the searching), not on “identify[ing]” “cognate” users. In Dumais, a query is modified based on the target user’s interests, via tags.

143. Dr. Houh opines that collaborative filtering in Dumais is the same as “identify[ing] ...at least one other of the plurality of users that is cognate to the user.” I disagree. This is because cognate users in the ‘217 Patent are more restricted than the generic collaborative filtering described in Dumais. This is because every claim requires that the system “identify” a second, “cognate” “user” **that is also** “a recipient of the piece of electronic content.” EX1005, Claim 1; EX2001, ¶ 100. Moreover, the ‘217 Patent explains **why** the system needs to “identify” this “cognate”/“recipient” user. *Supra* ¶¶ 76-87. Collaborative filtering in Dumais does not do any of this. Instead, Dumais uses collaborative filtering to “predict likely or possible profiles for new users.” *Id.* (citing EX1006, [0055]). For

these reasons, “*cognate*” users in the ‘217 Patent are more restricted than the generic collaborative filtering in Dumais.

144. In the ‘217 Patent, the purpose of identifying other “*cognate*” users is so that the actions of those “*cognate*” users can be monitored and considered in determining a relevance score. *See supra* ¶¶ 76-87. In contrast, collaborative filtering in Dumais is used to “develop profiles” for individuals or groups. EX1006, [0052]. In Dumais, collaborative filtering is used to “predict likely or possible profiles for new users of a system.” EX1006, [0055]. This is different from the ‘217 Patent “*identify ...*” limitation.

145. In sum, Dr. Houh relies upon collaborative filtering in Dumais to satisfy the “*identify ...*” limitation, but collaborative filtering in Dumais does not serve that purpose. Collaborative filtering in Dumais is not used to “*identify*” users **both** that are similar to the user doing the searching (i.e., another “*user*” that is “*cognate to the user*”) **and also** received the same content as the first user doing the searching (i.e., another “*user*” that is “*a recipient*”).

146. Dumais does not appreciate – or lay out the math that would be required to take into account – the relationship between the primary user and another user, including that Dumais does not attempt to “*identify*” another “*user*” that is **both “a recipient” and also “cognate” to the first user.**

147. In sum, the ‘217 Patent requires “*identify[ing]*” a second “*user*” that is both (1) “*a recipient*” of the same “*piece of electronic content*” that the first user received and also (2) “*is cognate to the user.*” Dumais does not disclose identifying either of these types of users, and Dumais certainly does not disclose identifying another “*user*” that is both “*a recipient*” and also “*cognate.*” Therefore, Dumais does not disclose “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*”

EX1001, at Claims. Because every claim of the ‘217 Patent requires this limitation, Dumais does not render obvious any claim of the ‘217 Patent.

B. Ground 3: Claims 1-22 of the ‘217 patent are not obvious based on Dumais and Marston.

148. Claims 1-22 of the ‘217 patent are not obvious based on Dumais and Marston, largely for the same reasons discussed above with regard to Dumais. In addition, because Dumais and Marston are different systems that solve different problems using different solutions, a skilled artisan would not be motivated to combine the two references or expect to be successful in doing so.

149. As set forth above, Dumais does not teach the following limitation required by every claim of the ‘217 Patent: “*identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is*

cognate to the user.” EX1001, at Claims. Petitioner does not try to fill that gap with Marston. Therefore, the Dumais-Marston combination does not render obvious any claim of the ‘217 Patent.

C. Ground 4: Claims 1-3, 5-9, 13-15, and 18-22 of the ‘217 patent are not obvious based on Kircher and Krug.

150. Claims 1-3, 5-9, 13-15, and 18-22 of the ‘217 patent are not obvious based on Kircher and Krug.

1. The Inventions in Kircher Are Very Different from the Inventions in the ‘217 Patent.

151. The inventions in the Kircher reference are very different from the inventions in the ‘217 Patent, for numerous reasons.

152. First, on the one hand, Kircher categorizes received an email message into an action category. On the other hand, the ‘217 Patent discloses a computer system that includes monitoring module configured to track actions by users associated with emails and measure relevance. An ‘importance’ factor is determined for each entity (users, groups, Job codes etc.) in the system, acting to weight various inputs to the relevance algorithms. Importance is based on historical learning in the system, based on previous actions by users. The electronic content as determined dependent on one or more actions of the user on the piece of electronic content, and a measure of a relevance of the piece of electronic content

as determined dependent on one or more actions of at least one other of the plurality of users that is a recipient of the piece of electronic content. “User actions (e.g., what did the user do with that piece of electronic mail), other user actions (e.g., what did other users do with that piece of electronic mail), and/or administrative settings” may determine the relevance and/or importance of an instance of electronic mail.

153. Second, the ‘217 Patent uses a relational architecture, where in a relational mail system, “electronic mail is transacted through the use of links, or pointers, among electronic mail objects as they are created over time.” Kircher did not have relational architecture.

154. Third, the ‘217 Patent utilizes multi-dimensional relevance system that rates the importance of each piece of email message based on user actions, user collaborative actions and administrative setting. In contrast, Kircher predicts four possible user actions on the incoming email messages. Hence, the two objectives of the two references are different.

155. Fourth, underneath approaches are different in these two patents. The ‘217 Patent utilizes three lists of attributes which could feasibly influence the system relevance to a receiver user. The three lists are groupings according to mail actions relevance, collaborative relevance, and defined importance factors.

Temporal aspects are considered. Kircher utilizes fuzzy logic to categorize email messages into one of four actions as discussed before.

2. The Inventions in Krug Are Very Different from the Inventions in the '217 Patent.

156. The inventions in the Krug reference are very different from the inventions in the '217 Patent, for numerous reasons.

157. **First**, the overall objectives of the two patents differ. Krug does not focus on “sent” content; instead, Krug is centered on identifying relevant objects from a collection of objects in response to a user’s search query. In this case, the objects are HTML pages. In contrast, the '217 Patent focuses specifically on “sent” content, aiming to manage “sent” content efficiently so that recipients can easily locate specific messages.

158. **Second**, Krug does not incorporate a relational model for objects, whereas the '217 Patent emphasizes a relational model for “sent” content.

159. **Third**, the '217 Patent, on the one hand, and Krug, on the other hand, employ distinct techniques to achieve their objectives. Krug describes evaluating the relevance of objects (i.e., electronic content) on the Internet within the system, then sorts and ranks them accordingly. It employs prioritization and filtering techniques to identify relevant objects for users. The core of Krug’s approach relies

on user and object profiles, determining similarity based on Euclidean distance. On the other hand, the '217 Patent utilizes a multi-dimensional relevance system that assesses the importance of each piece of “sent” content based on user actions, collaborative user interactions, and administrative settings. This relevance system cannot be substituted by Krug’s similarity measure. Therefore, the two approaches are fundamentally different.

3. The Inventions in Krug Are Very Different from the Inventions in Kircher.

160. The inventions in the Krug reference are very different from the inventions in Kircher, for numerous reasons.

161. First, Kircher and Krug are directed to different systems of electronic content. Kircher relates to communications over a network and addresses “Intelligent message screening.” EX1007, [0001]. In contrast, Krug relates to a “plurality of objects on the Internet,” such as “electronic catalogs of mail order companies.” EX1008, [0010]. Krug’s focus is not on “sent” content.

162. Second, Kircher utilizes fuzzy logic to categorize email messages into one of four actions as discussed before. In contrast, the core of Krug’s approach relies on user and object profiles, determining similarity based on Euclidean distance.

163. Third, Kircher and Krug use two different ranking mechanisms/functions. These functions are different and heterogeneous in nature.

164. The system in Kircher cannot be substituted by Krug's similarity measure. The two approaches are fundamentally different.

4. Neither Kircher Nor Krug Teaches or Discloses the “identify[ing] ...” Limitation and, Therefore, the Combination Does Not Render Obvious Any Claim.

165. Every claim of the '217 Patent requires “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” EX1001, at Claims. As set forth below, neither Kircher nor Krug teaches or discloses this limitation. Therefore, even if a POSA were to combine the references – which, as set forth below, a POSA would not – the combination would still not render obvious any claim of the '217 Patent.

a) Kircher Does Not Teach, Disclose, or Render Obvious the Limitation of “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*”

166. Kircher does not teach or disclose the limitation of “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” In the '217 Patent, the purpose of “*identifying*” other “*cognate*” “*recipients*” of the same piece of content is so that the system can then monitor the actions of those other “*cognate*” “*recipients*” to

help determine a relevancy score. *Supra* ¶¶ 76-87; EX1001, Claim 1 (determining second measure of relevancy based on “one or more **actions on the piece of electronic content** of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user”); EX1001, at Claim 8 (“The system of claim 1, wherein identifying at least one other of the plurality of users that is cognate to the user comprises **analyzing historical actions** of the at least one other of the plurality of users with respect to historical actions of the user.”). Kircher, in contrast, never “identifies” another recipient for the purpose of monitoring the other recipient’s actions. EX1007, [0017]. Because Kircher is focused on a single user’s inbox, Kircher does not need to “identify” other “recipients.” Therefore, Kircher does not disclose “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content.*”

167. In addition to requiring “*identifying*” a second “*user*” that is “*a recipient*,” the “*identify...*” limitation also requires that this second “*user*” that is “*a recipient*” also be “*cognate to the [first] user.*” Kircher does not teach or disclose “*identify[ing] at least one other of the plurality of users ... that is cognate to the user.*” Kircher is focused on a single user’s inbox and only looks at the actions of that single user. In particular, Kircher looks at the actions of a single user on a “current” message to affect the processing of future messages. EX1007, [0001].

b) Krug Does Not Teach, Disclose, or Render Obvious the Limitation of “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*”

168. Like Kircher, Krug also does not teach or disclose the limitation of “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” Krug is a method and device for determining relevant objects in response to a search query on the Internet. EX1008, [0001]. The content being searched for in Krug are objects on the Internet, in particular, electronic catalogs of mail order companies. EX1008, [0010]. Krug does not disclose “*identifying*” another “*recipient*” of the same piece of electronic content.

169. I understand that Dr. Houh asserts that Krug discloses the “*recipient*” limitation because Krug discloses that “[t]he groups of users can be specified (for example, all women) or determined automatically (for example, **all users who access a specific object**).” EX1004, ¶ 505 (citing EX1008, [0031]). I disagree.

170. Krug’s specification of a group of users based on “users who access a specific object” is different from the ‘217 Patent’s requirement to “*identify*” another user that is “*a recipient*” of the object (and also “cognate to the user”). As discussed above in connection with the Dumais reference, in the ‘217 Patent, “a

recipient” is a specific type of “*user*”: a user that received the same piece of content sent from a sender. Krug – which, like Dumais, is a search/retrieval system rather than a person-to-person communications system – does not disclose “*identifying*” another “*recipient*” of the same piece of electronic content. Krug does not disclose the “*identify ... a recipient*” limitation.

171. A bigger problem with Dr. Houh’s analysis is that Dr. Houh does not even address the verb in the claim limitation “*identify*...*a recipient*”; he does not analyze the verb “*identify*” at all. EX1004, ¶ 505 (“a POSA would understand that in the [Kircher-Krug] combination [Krug’s] ‘user groups’ are a “*plurality of users that is a recipient of the piece of electronic content.*”). Dr. Houh’s analysis does not cite to any prior art reference to supply the “*identify* ... *a recipient*” limitation, and there is no reference that does. The system in Krug does not attempt to “*identify*” such “*recipients*” as part of “*determining a relevance score of a piece of electronic content.*” Dr. Houh’s failure to even address the requirement to “*identify* ... *a recipient*” shows that the Kircher-Krug combination does not render obvious any claim of the ‘217 Patent.

172. Moreover, even if Dr. Houh were correct that Krug’s “user groups” can be made up “*recipients*” of the same content (which he is not), nothing in Krug teaches or suggests the desirability of “*identify[ing] at least one other of the*

plurality of users that is a recipient of the piece of electronic content” – i.e., the desirability of “*identifying*” a second user that received the same piece of content as the first user. Instead, in Krug, the purpose of creating “user groups” is to allow a user to search the Internet for content using the “user group” profile instead of the user’s own profile. E.g., EX1008, [0123] (“If the search query is submitted by selecting a group ..., the group profile of the selected community is used instead of the user profile.”).

173. The ‘217 Patent also requires “*identify[ing] at least one other of the plurality of users ... that is cognate to the user.*”

174. Neither Kircher nor Krug teaches or suggests a need to “*identify*” another user that is “*cognate to the [first] user*” and “*a recipient.*”

175. As set forth above, Dr. Houh does not rely upon Kircher for this limitation. This is because Kircher does not consider a user’s actions on a piece of electronic content at all, let alone the actions of users that are “*cognate*” to the first user.

176. With respect to Krug, nothing in Krug shows an appreciation of the desirability of, or mathematics required to, “*identify*” another user that is “*cognate to the [first] user.*”

177. Dr. Houh asserts that this limitation is disclosed by Krug because Krug discloses “user groups” that have “group profiles.” EX1004, ¶¶ 505-509. Dr. Houh states that, in Krug, these “user groups” can be formed through (1) “direct input by a user” (e.g., a user group of “all women” based upon users indicating on their profiles that they are women) or (2) “made implicitly” based upon “usage behavior.” EX1004, ¶¶ 505-507. He equates Krug’s “user groups” to the ‘217 Patent’s “cognate groups.” EX1004, ¶ 505. I disagree.

178. In my opinion, Krug’s creation of “user groups” is **not** the same as the ‘217 Patent’s “*identify...*” limitation.

179. The ‘217 Patent requires that the “*at least one other of the plurality of users*” being “*identif[ie]d*” must be “*cognate to the user.*” The reference to “*the user*” refers to the first user that is doing the searching (i.e., the user for which relevancy is being determined), and the second user being identified must be “*cognate to the [first] user.*” Krug, however, does not discuss the **desirability** of “*identify[ing]*” a second “*user*” that is “*cognate to the [first] user.*” Instead, Krug teaches only that its “user groups” can be used to allow a user to search under the profile for the “user group” instead of searching using the user’s own user profile. EX1008, [0049].

180. In Krug, a “group profile” is “an average user profile of the group.” EX1008, [0056]. A group could be “all women,” or “auto mechanics.” EX1008, [0031]. A user can be automatically assigned to a group “based on the presence of certain properties of the user” (e.g., if a user’s profile indicates the user is a woman). EX1008, [0031]. Or, a user can assign himself to a group. EX1008, [0031]. For example, an individual user in Krug can “select[] a group profile” (e.g., for auto mechanics) when running a search query (e.g., related to automobiles). EX1008, [0031]. By selecting the auto mechanics “group profile” for searching relating to automobiles (instead of the individual’s “user profile”), the search results may include “objects with a more pronounced technical aspect.” EX1008, [0031].

181. In sum, creating a “group profile” in Krug is not the same as the “*identify...*” limitation in the ‘217 Patent.

182. Dr. Houh also opines that “typical user profile[s]” in Krug are the same as “*cognate*” “*users*” in the ‘217 Patent. EX1004, ¶ 589. I disagree. Krug discusses that an “object profile” for a document on the Internet can be determined by “taking into account ... typical user profiles” – i.e., the profiles of “users who have accessed the object.” EX1008, [0038], [0039]. Considering “typical user profile[s]” when creating an “object profile” in Krug, however, is not the same as

“*identify[ing]*” “*cognate*” users in the ‘217 Patent. In the ‘217 Patent, the purpose of “*identify[ing]*” a second “*user*” who is “*cognate*,” or similar to, the first user is that the second user’s actions can then be used to determine a “relevance score” for a piece of content for the first user. *Supra* ¶¶ 76-87. Krug never discusses “*identify[ing]*” a second user that is “*cognate*” to the first user to help determine a “*relevance score*” of a piece of electronic content for the first user.

183. For all of these reasons, Krug does not disclose the “*identify...*” limitation.

184. Importantly, the ‘217 Patent requires “*identif[y]ing*” another “*user*” that **is both** “*a recipient*” **and also** “*is cognate to the [first] user*.” Krug does not teach or suggest “*identifying*” another “*user*” that is **both** “*a recipient*” **and also** “*is cognate to the [first] user*.”

185. For example, Krug could form a “user group” of “all women” (based upon their direct input in profiles), and Krug could form a separate “user group” of all users that “accessed” a particular object. However, Krug never “**identifies]**” another “*user*” that **both** “*is a recipient of the piece of electronic content*” **and also** “*is cognate to the user*” doing the searching. In Krug, the “user group” is **either** a group of all women **or** a group of all users that accessed an object. For example, Krug states that a “plurality of virtual communities are available, for example, the

group of all women or the users of a specific document.” EX1008, [0049] (emphasis added). Krug does not “*identify...*” a second user that is part of **both** “communities,” and Krug does not “*identify...*” a second user that shares **both** similarities – i.e., “*a recipient*” **and** “*cognate*” – with the first user.

186. In sum, Dr. Houh relies upon the “user groups” in Krug to satisfy the “*identify ...*” limitation, but “user groups” in Krug do not serve that purpose. Krug’s “user groups” are not used to “*identify*” users **both** that are similar to the user doing the searching (i.e., another “*user*” that is “*cognate to the user*”) **and** **also** received the same content as the first user doing the searching (i.e., another “*user*” that is “*a recipient*”).

187. Instead, Krug uses “user groups” to allow a user to conduct searches under the “user group” profile instead of under the user’s own profile.

188. Krug does not appreciate – or lay out the math that would be required to take into account – the relationship between the primary user and another user, including that Krug does not attempt to “*identify*” another “*user*” that is **both “a recipient” and also “cognate” to the first user.**

189. In sum, both Kircher and Krug fail to disclose “*identify[ing] at least one other of the plurality of users that is a recipient of the piece of electronic*

content and that is cognate to the user.” The combination of Kircher and Krug does not render obvious any claim of the ‘217 Patent.

190. Even if Kircher and/or Krug did disclose “*identify[ing]*” another user that is both “*a recipient*” of the same content and also is “*cognate to the user,*” which they do not, for the reasons set forth below, a POSA would not look to combine Kircher and Krug to make the inventions in the ‘217 Patent. *See infra* at ¶¶ 139-147.

5. Numerous Additional Limitations in the ‘217 Patent Claims Are Missing from Kircher.

191. In addition to the “*identify...*” claim limitation, Dr. Houh’s analysis acknowledges that certain limitations required by the claims of the ‘217 Patent are not taught or suggested by Kircher. For these limitations, Dr. Houh relies entirely upon Krug to fill in those gaps.

a) Kircher Does Not Teach or Disclose the Limitation of “*track[ing] actions by a plurality of users associated with an application for managing electronic content.*”

192. Every claim of the ‘217 Patent requires “*track[ing] actions by a plurality of users associated with an application for managing electronic content.*” EX1001, at Claims. Kircher’s focus is on a single user’s inbox. EX1007, [0010]. Kircher’s focus is not the actions of other users, and Kircher does not disclose the limitation in the ‘217 Patent requiring “*track[ing] actions by a plurality of users*

associated with an application for managing electronic content.” Dr. Houh relies upon Krug to fill in this gap. EX1004, ¶¶ 471-473 & 476.

b) Kircher Does Not Teach, Disclose, or Render Obvious the Limitation of “determining a first measure of relevance of the piece of electronic content based at least in part on one or more actions of the user on the piece of electronic content.”

193. Every claim of the ‘217 Patent requires “*determining a first measure of relevance of the piece of electronic content based at least in part on one or more actions of the user on the piece of electronic content.*” EX1001, at Claims. Kircher does not teach, disclose, or render obvious the limitation of “*determining a first measure of relevance of the piece of electronic content based at least in part on one or more actions of the user on the piece of electronic content.*” In particular, Kircher does not use “*actions of the user*” “on *the piece* of electronic content” to “*determine a first measure of relevance of the piece of electronic content.*” Instead, in Kircher, the user’s actions are considered in assigning categories to future pieces of electronic content: “the recipient’s response to and handling of current messages affects the automated processing of future messages.” EX1007, [0001] (emphasis added); *see also* EX1007, [0009], [0019], [0046], [0057], [Claims 22 & 47]. Dr. Houh relies upon Krug’s “action equivalence” to fill in this gap. EX1004, ¶¶ 485-487 & 562.

c) Kircher Does Not Teach or Disclose the Limitation of “a second relevance measurement module coupled to the monitoring module.”

194. Claims 1 and 6 of the ‘217 Patent require “a second relevance measurement module coupled to the monitoring module.” Kircher does not disclose this limitation. Dr. Houh relies upon Krug to fill in this gap. EX1004, ¶¶ 493-497 & 509.

d) Kircher Does Not Teach or Disclose the Limitation of “determine[ing] a second measure of relevance of the piece of electronic content as based at least in part on one or more measures derived from the group consisting of: [a] a local importance describing an importance of the sender to the user [or] [b] a global importance describing an importance of the sender within an organization with which the plurality of users are associated.”

195. Kircher alone does not disclose “determine[ing] a second measure of relevance of the piece of electronic content as based at least in part on one or more measures derived from the group consisting of: [a] a local importance describing an importance of the sender to the user [or] [b] a global importance describing an importance of the sender within an organization with which the plurality of users are associated.” For the “local importance” and “global importance” “measures,” Dr. Houh relies upon Krug’s “comparison value” being combined with Kircher’s “sender importance.” EX1004, ¶¶ 518-519 & 529-531 & 536-538.

e) Kircher Does Not Teach or Disclose the Limitation of determine[ing] a second measure of relevance of the piece of electronic content as based at least in part on one or more measures derived from the group consisting of: [d] one or more actions on the piece of electronic content of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.”

196. Kircher does not disclose “*determine[ing] a second measure of relevance of the piece of electronic content as based at least in part on one or more measures derived from the group consisting of: [d] one or more actions on the piece of electronic content of the at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.*” Dr. Houh relies upon Krug for this limitation. EX1004, ¶¶ 550-553

f) Kircher Does Not Teach or Disclose the Limitation of “determin[ing] the relevance score of the piece of electronic content sent from the sender to the user.”

197. Kircher alone does not disclose “*determin[ing] the relevance score of the piece of electronic content sent from the sender to the user.*” For this limitation, Dr. Houh relies upon Krug’s “comparison value” being “combined and integrated into” the “ranking number” and “numerical value assigned to each email” of Kircher, “such that the emails of Kircher are ranked (at least in part) using the comparison value of Krug.” EX1004, ¶ 559.

g) Kircher Does Not Teach or Disclose the Limitation of “determining the relevance score ... based at least in part on the first determined measure of relevance”

198. Every claim of the ‘217 Patent requires “*determining the relevance score of the piece of electronic content sent from the sender to the user, the relevance score being determined **based at least in part on the first determined measure of relevance** and on the second determined measure of relevance.*”

EX1001, at Claims (emphasis added). As set forth above, however, Kircher does not disclose a “*first determined measure of relevance*” because Kircher does not disclose “*determining a first measure of relevance of the piece of electronic content based at least in part on one or more **actions of the user on the piece of electronic content**.*” Therefore, Kircher also does not teach or disclose determining a relevance score “*based at least in part on the first determined measure of relevance.*” For this limitation, Dr. Houh relies upon Krug’s “comparison value.” EX1004, ¶ 565.

h) Kircher Does Not Teach or Disclose the Limitation of “a search module configured to search the electronic document in accordance with the determined relevance score”

199. Kircher does not disclose the limitations in Claims 3, 14, or 19 (“*a search module configured to search the electronic document in accordance with*

the determined relevance score”). Dr. Houh relies upon Krug for Claims 3 and 14.

EX1004, ¶¶ 576, 625 & 655.

i) Kircher Does Not Teach or Disclose the Limitation of “wherein identifying at least one other of the plurality of users that is cognate to the user comprises analyzing historical actions of the at least one other of the plurality of users with respect to historical actions of the user.”

200. Kircher does not disclose the limitations in Claims 8 and 22

(“...wherein identifying at least one other of the plurality of users that is cognate to the user comprises analyzing historical actions of the at least one other of the plurality of users with respect to historical actions of the user”). Dr. Houh relies upon Krug for Claims 8 and 22. EX1004, ¶¶ 589 & 661.

j) Kircher Does Not Teach or Disclose the Limitation of “[t]he system of claim 8, wherein the at least one other of the plurality of users is cognate to the user, and the user is not cognate to the at least one other of the plurality of users.”

201. Kircher does not disclose the limitations in Claim 9 (“The system of claim 8, wherein the at least one other of the plurality of users is cognate to the user, and the user is not cognate to the at least one other of the plurality of users.”). Dr. Houh relies upon Krug for that claim. EX1004, ¶¶ 592-593.

6. Numerous Additional Limitations in the ‘217 Patent Claims Are Missing from Krug.

202. As set forth above, Krug is an invention relating to retrieving documents in response to a search query “from the plurality of objects on the Internet, in particular, from electronic catalogs of mail order companies.” EX1008, [0010]. Krug is not a system or method relating to person-to-person communications, and Krug does not disclose (1) “*determining a relevance score of a piece of electronic content sent from a sender to a user*” or “*determining the relevance score of the piece of electronic content sent from the sender to the user.*”

a) Krug Does Not Teach or Disclose the Limitation of “determining a relevance score of a piece of electronic content sent from a sender to a user ...” (1[pre]/6[pre]/7[pre]).

203. The preamble of each independent claims (i.e., Claims 1, 6, and 7) all require “*determining a relevance score of a piece of electronic content sent from a sender to a user ...*” EX1001, at Claims. Krug is a method and device for determining relevant objects in response to a search query on the Internet. EX1008, [0001]. The content being searched for in Krug are objects on the Internet, in particular, electronic catalogs of mail order companies. EX1008, [0010]. Krug does not disclose or teach determining relevance scores for content “*sent from a sender to a user.*” EX1008.

b) Krug Does Not Teach or Disclose the Limitation of “determining the relevance score of the piece of electronic content *sent* from the *sender* to the user” (1[h], 6[f], 7[e]).

204. As with the preamble, the last limitation in each of the independent claims in Krug also requires “*determining a relevance score of a piece of electronic content sent from a sender to a user ...*” EX1001, at Claims. Krug is a method and device for determining relevant objects in response to a search query on the Internet. EX1008, [0001]. The content being searched for in Krug are objects on the Internet, in particular, electronic catalogs of mail order companies. EX1008, [0010]. Krug does not disclose or teach “*determining the relevance score of the piece of electronic content sent from the sender to the user.*” EX1008.

7. A POSA Would Not Be Motivated to Combine Kircher and Krug.

205. As set forth above, both Kircher and Krug are missing many of the limitations required by the claims of the ‘217 Patent. Dr. Houh argues that a POSA would have been motivated to take the parts of Kircher that disclose some limitations of the ‘217 Patent and combine them with the parts of Krug that disclose other limitations of the ‘217 Patent and that doing so would render obvious the claims of the ‘217 Patent. I disagree with this statement, for numerous reasons.

206. First, as set forth above, neither Kircher nor Krug discloses the “*identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user*” limitation. Therefore, no combination of the references renders obvious any claim of the ‘217 Patent.

207. Second, a POSA would not be motivated to combine Kircher and Krug to create the inventions in the ‘217 Patent because the two references are so different. On the one hand, Krug relates to searching objects on the Internet and, in particular, searching electronic catalogs of mail order companies. Krug is, therefore, an invention relating to retrieving objects on the Internet in response to search queries. In contrast to the search/retrieval system in Krug, Kircher relates to e-mail messages. A POSA would not look to Krug at all to solve the problems solved in the ‘217 Patent, let alone combining Kircher with Krug to do so.

208. Dr. Houh opines that there are two reasons why Krug is “analogous” to Kircher and the ‘217 Patent. Both of the reasons is premised upon inaccurate statements.

209. First, Dr. Houh opines that Krug is “in the same field of endeavor—*i.e.*, email and content management systems.” EX1004, ¶ 436. To the extent that Dr. Houh is suggesting that Krug is an email management system, I disagree. Krug

relates to searching for content on an Internet browser. Krug does not relate to managing email.

210. Second, Dr. Houh states that Krug is “reasonably pertinent” to the problem of “counteracting the proliferation of spam.” EX1004, ¶ 436; EX1004, ¶ 441 (“Krug ... seek[s] to eliminate or reduce the amount of spam...”). I disagree. Krug relates to searching for content on an Internet browser. A skilled artisan would not understand Internet search results to include “spam.” Instead, a skilled artisan would understand “spam” to relate to unwanted messages in a mail system. Krug does not address, or relate to, the proliferation of spam.

211. Another reason a POSA would not make the combination that Dr. Houh advances is because POSA would not have been motivated to combine the references as Petitioner advances. As set forth above, Kircher does not disclose numerous limitations in the ‘217 Patent claims, including the “*identify ...*” limitation. *Supra* ¶¶ 191-201. And, Krug does not disclose, for example, “*determining the relevance score of the piece of electronic content sent from the sender to the user.*” Therefore, to create the invention in the ‘217 Patent claims would require more than simply borrowing from Krug a single feature that is missing from Kircher. The only reason to combine Kircher’s “sent” electronic

content with Krug's tracking users' actions, for example, would be hindsight reasoning, using the claims as a roadmap.

8. Combining Krug with Kircher as Dr. Houh Proposes Would Render Kircher Inoperable.

212. Another reason a POSA would not make the combination that Dr. Houh advances is because a POSA would not know how to combine such different references into the inventive system of the '217 Patent. Dr. Houh does not explain exactly how a POSA would combine the references, and it is not obvious how a POSA would combine the references. In fact, combining the references as Dr. Houh proposes would render Kircher inoperable.

213. Dr. Houh opines that Krug's web browser program can be added to existing document management systems as a plug-in and that "it would be a matter of simple subst[itu]tion to include the plug-in that embodies the invention of Krug" "into the 'computer program'" of Kircher. EX1004, ¶¶ 423 & 427 (citing EX1008, [0099, 0130]); EX1004, ¶ 516 ("[T]he plug-in that embodies the invention of Krug (including its relevance measurement and ranking system) would be combined with the 'computer program' of Kircher"). I disagree.

214. First, the statement in Krug that its invention can be used as a "plug-in" refers to using its invention as "a plug-in 10 for a commercially available

Internet browser 11.” EX1008, [0099] (emphasis added). Krug explains that its plug-in “logs the user's access to and interactions with objects 4 **on the Internet using the Internet browser.**” EX1008, [0099]; *see also* EX1004, ¶ 424. The system in Kircher, of course, is **not** an “Internet browser.” Kircher is an electronic message system. EX1007. Dr. Houh provides no analysis of how a skilled artisan would “plug-in” to Kircher’s non-Internet-browser environment. Krug contains no teaching or suggestion of how its invention could be plugged into a **non**-Internet-browser environment.

215. It is my opinion that Krug’s invention could not be “plugged into” Kircher’s non-Internet browser environment. As discussed above, Krug uses a **search engine** for its priority ranking. Kircher, however, does not. Instead, Kircher ranks all electronic messages within its system. As a result, if Krug’s math were put into Kircher “as is,” the “plug in” would render Kircher’s system inoperable. Dr. Houh does not explain how a skilled artisan would adjust the formula in Kircher’s non-search-engine system.

216. The “search engine” in Krug is fundamental to the equation used in Krug – i.e., Krug’s formula for calculating the initial priority of objects. *See supra* ¶¶ 104 & 118-121. In Krug’s formula, the initial priority (GR) is a function of two parameters: the weight assigned to the search engine and the rating of the object as

calculated by that engine, with each search engine being assigned its own weight — $Sg^{(1)}, Sg^{(2)}, \dots Sg^{(S)}$. For each object, a priority rating $Rz(i)$ is generated. Based on this rating, the objects are ordered, and their initial priorities are established.

The initial priority rating of an object is defined as follows: $GR_z^{(i)} = \text{pr}(R_z^{(i)}, Sg^{(i)})$.

217. It is important to note that **GRm(k), the initial priority weight, does not exist in Kircher's method.** In the Eq 1, the two terms ($GRm(k), OCm(k)$) in Krug's equation are entirely foreign to Kircher's approach. Therefore, a POSITA would face significant challenges in attempting to combine the two systems. Ignoring or discarding $GRm(k)$ would likely result in unsatisfactory outcomes.

218. If a skilled artisan attempted to add Krug's invention to Kircher, the skilled artisan would need to discard the search engine portion of Krug's formula. This is because search engines do not have access to, nor do they index, private email content. Therefore, search engines cannot be used to rank email messages.

219. If the search engine function in Krug's invention were discarded (as it would need to be in Kircher's system), Krug's formula for calculating the initial priority of objects would no longer work.

220. Moreover, in Krug, the evaluation of the initial priority is also used in calculating the final comparison between an object's profile and a user's profile. Therefore, the final comparison also would not work.

221. Dr. Houh does not acknowledge this problem – i.e., that Krug's formula relies upon search engines. Instead, he opines that "it would have been obvious to include the numerical rankings of Krug into the system of Kircher." EX1004, ¶ 432. That is incorrect. Krug's "numerical rankings" are based upon search engines and are, therefore, incompatible with Kircher's system.

222. Because Dr. Houh does not acknowledge the problem that Krug's "numerical rankings" are incompatible with Kircher's system, Dr. Houh also does not suggest any way to overcome the problem.

223. In sum, Krug's formulas rely on results from external "search engines" that are not present in – and could not be added to – Kircher's e-mail system. Krug, therefore, cannot simply be "plugged into" Kircher. If Krug were to be simply "plugged into" Kircher, doing so would render Kircher's system inoperable.

224. Dr. Houh does not explain how a POSA would combine the references – i.e., which parts of Kircher would be used and which parts of Krug would be used. For example, Krug determines relevant objects in response to a

search on the Internet, comparing user profiles and object profiles and using Euclidian distance to determine relevancy. Krug does not consider the relevancy of sent pieces of electronic content. In contrast, Kircher considers the relevancy of emails based upon three enumerated factors (sender importance, personalization, and content), each having specific subfactors. Dr. Houh does not explain which features of Kircher and Krug would be kept and which features would be discarded in the combination. For example, would the combination still use Krug's Euclidian distance calculations between object profiles and user profiles? Or would that feature of Krug be discarded? If so, why would a skilled artisan be motivated to discard that feature from Krug? Or would the combination somehow use both Krug's Euclidian distance and also use Kircher's three factors? If so, how? It is not obvious how a skilled artisan would combine Kircher and Krug. Determining how the references could be combined into a single system or method would require an undue amount of additional work and research.

225. Finally, a POSA would not expect to succeed in combining the references as Petitioner advances. As discussed above, combining the references as Dr. Houh proposes would render Kircher inoperable. Moreover, Kircher and Krug use two different ranking mechanisms/functions. These functions are different and

heterogeneous in nature. Hence, a POSA would expect that combining Kircher and Krug would not be feasible.

226. A POSA would expect that simple substitution of elements between Kircher and Krug may not work. On one hand, Kircher's scoring function is based on three factors (sender importance, degree of personalization, and content importance). On the other hand, Krug's scoring function is based on a number of factors such as intrinsic value of an object, distance between user profile and object profile. These two score functions are incompatible to each other-- heterogeneous in nature. Therefore, simple merging/substitution will not work.

227. Kircher and Krug use different ranking functions. Functions use various components/features that may be present in one patent and absent in another patent – heterogeneous collections. More specifically, in Kircher, score is a function of sender importance, personalization, and content importance. In Krug, score between kth object and jth user is a function of absolute numeric value of kth object, user specific intrinsic value of kth object, ..., difference of the profile aspect of kth object and jth user.

228. In my opinion, it is only through hindsight that a POSA would be motivated to combine the references. In particular, the only reason a POSA would look to combine Kircher and Krug would be to try to recreate, using hindsight, the

claims of the ‘217 Patent. I understand, however, that using the claims as a roadmap is prohibited in the obviousness analysis.

D. Ground 5: Claims 4, 10-12, 16-17, and 20-21 of the ‘217 patent are not obvious based on Kircher, Krug, and Marston.

229. Claims 4, 10-12, 16-17, and 20-21 are not obvious based on the combination of Kircher, Krug, and Marston, largely for the same reasons discussed above with regard to the combination of Kircher and Krug.

230. As set forth above, the combination of Kircher and Krug does not disclose the following limitation required by every claim of the ‘217 Patent:

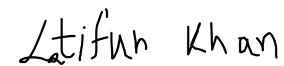
“identify at least one other of the plurality of users that is a recipient of the piece of electronic content and that is cognate to the user.” EX1001, at Claims. Petitioner does not try to fill that gap with Marston. Therefore, for the same reasons discussed above, the combination of Kircher, Krug, and Marston does not render obvious any claim of the ‘217 Patent.

231. In addition, Petitioner’s combination takes parts from Krug, parts from Kircher, and parts from Marston, but the three references all involve different systems that solve different problems using different solutions. Therefore, a skilled

artisan would not be motivated to combine the references or expect to be successful in doing so.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 10th day of September 2025, in Plano, Texas.



Latifur Khan, Ph.D.