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Transcript of Loren G. Terveen, Ph.D., Volume II

Date: March 24, 2026

Case: Microsoft Corporation -v- X1 Discovery, Inc. (PTAB)

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Conducted on March 24, 2026

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181 1 UNITED STATES PATENT AND TRADEMARK OFFICE 2 ----- 3 BEFORE THE PATENT TRIAL AND APPEAL BOARD 4 ----- 5 MICROSOFT CORPORATION, 6 Petitioner, 7 v. 8 X1 DISCOVERY, INC., 9 Patent Owner. 10 ----- 11 Case No. IPR2025-00253 -00254 -00255 12 U.S. Patent No. 7,370,035 13 14 DEPOSITION OF LOREN G. TERVEEN, PH.D. 15 APPEARING REMOTELY FROM MINNEAPOLIS, MINNESOTA 16 TUESDAY, MARCH 24, 2026 17 11:00 A.M. 18 19 20 Job No.: 622788 21 Pages 181 - 221 22 Reported by: Adrienne M. Mignano, RPR	183 1 A P P E A R A N C E S 2 ON BEHALF OF PETITIONER - MICROSOFT: 3 TODD SIEGEL, ESQUIRE 4 SAM THACKER, ESQUIRE 5 KLARQUIST SPARKMAN, LLP 6 One World Trade Center 7 121 SW Salmon Street 8 Suite 1600 9 Portland, Oregon 97204 10 503.595.5300 11 12 ON BEHALF OF PATENT OWNER: 13 CHRISTIE LAROCHELLE, Ph.D., ESQUIRE 14 EMMA MURRAY, ESQUIRE 15 STEPHEN KERR, ESQUIRE 16 GOODWIN PROCTER LLP 17 100 Northern Avenue 18 Boston, Massachusetts 02210 19 617.570.1000 20 21 22
182 1 Deposition of LOREN G. TERVEEN, PH.D., held 2 via Zoom videoconferencing, pursuant to Notice, 3 before Adrienne M. Mignano, a Registered 4 Professional Stenographic Reporter and Notary 5 Public. 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	184 1 C O N T E N T S 2 EXAMINATION OF LOREN G. TERVEEN, PH.D. PAGE 3 MS. LAROCHELLE 185 4 5 6 E X H I B I T S 7 (Attached to the transcript) 8 EXHIBIT PAGE 9 Exhibit 1 "The Entourage Help Page" from 204 10 the Wayback Machine 11 12 13 14 15 16 17 18 19 20 21 22

185 1 Whereupon, 2 LOREN G. TERVEEN, Ph.D., 3 being first duly sworn or affirmed to testify to 4 the truth, the whole truth, and nothing but the 5 truth, was examined and testified as follows: 6 EXAMINATION BY COUNSEL FOR THE PATENT 7 OWNER 8 MS. LAROCHELLE: 9 Q Good morning, Dr. Terveen. 10 A Good morning. 11 Q Good to see you again. 12 I'm going to try to keep this 13 relatively short today. So we're here for your 14 deposition in the three IPRs, X1 versus -- or 15 Microsoft versus X1 in the IPR2025-253 for the 16 '035 patent, 254 for the '490 patent and 255 for 17 the '139 patent. 18 Does that all sound right to you? 19 A Yes. 20 Q Okay. And you submitted supplemental 21 declarations in each of these three IPR 22 proceedings, correct?	187 1 Exhibit 1001 in each of the three IPR 2 proceedings. 3 So just let me know when you have 4 downloaded those six documents. 5 I'm being told that that is the wrong 6 link that Emma provided. 7 MS. MURRAY: Yes. Sorry, let me just 8 get you the right one. We had an initial -- I 9 mean, it's mostly the same documents, but I'll 10 give you the new one because there are some 11 duplicates in the old one. 12 DR. LAROCHELLE: But the documents I 13 asked him to get are there, right? 14 MS. MURRAY: Yes, they are. 15 THE WITNESS: So ignore what I have 16 downloaded so far then, correct? 17 DR. LAROCHELLE: I'm deferring to 18 Emma. 19 MS. MURRAY: Yeah, maybe just ignore 20 and I'll get you the new link, and then this 21 will be easier. 22 THE WITNESS: Sure.
186 1 A Yes. 2 Q So I want to ask you a few questions 3 about the supplemental declarations. So what 4 I'd like you to do, if you could, is in the 5 exhibit download site, if you could get your 6 three supplemental declarations. So they are 7 titled -- each of them is titled "Supplemental 8 Declaration of Loren G. Terveen." They are 9 Exhibit 1100, I believe, in all three of the 10 proceedings. Sorry, my papers are a mess here. 11 A Are they reply declarations? 12 Q So the titles I have are 13 "Supplemental Declaration," and they are 14 Exhibit 1100. I think they are at the bottom of 15 that folder list. 16 A Yes. Yes, I've seen them. I think 17 the file names have "Reply" in them, but yes. 18 Q I see, okay. So if you could 19 download those three documents for me, and then 20 while you're doing that, I'd like to have you 21 download the three patents as well, the '035 22 patent, the '139 and the '490 patent. Those are	188 1 MS. MURRAY: I'm sorry about that. 2 That was my mistake. 3 BY DR. LAROCHELLE: 4 Q Okay. And so just to make sure we're 5 on the same page, we're going to download six 6 documents, the three supplemental declarations, 7 one for each of the IPR proceedings, and the 8 three patents, Exhibit 1001 in each of the three 9 proceedings. 10 A Okay. 11 Q And just let me know when you have 12 each of those. 13 A Yep. I'm waiting to connect. 14 Q Sure, take your time. 15 (Pause) 16 A Okay. I've downloaded and extracted 17 all six of those files. 18 Q Okay, perfect. So if you could open 19 up each of your three supplemental declarations, 20 and when you have them open, I want to start 21 with paragraph 19. So if you can page down to 22 that. I believe it's pages 10 and 11 in each of

189 1 the documents. 2 A You said 19, right? 3 Q Paragraph 19, yes. 4 A Yep. 5 Q And we're going to look at the very 6 end, the last sentence of paragraph 19. 7 Just let me know when you're there. 8 A Getting there. 9 Okay. 10 Q Okay. So the last sentence of 11 paragraph 19 in each of your supplemental 12 declarations states, "Moreover, the patent 13 claims do not require character-at-a-time 14 results because a system that practices the 15 claims does not return results until the user 16 enters a second search string (i.e., the user 17 could enter an entire word without receiving any 18 search results)." 19 Do you see that? 20 A Yes. 21 Q And can you confirm for me that that 22 sentence is the same across all three of your	191 1 in the first search field." 2 Do you see that? 3 A Yes. 4 Q So I want to try to square that with 5 the language from your declaration where you 6 said that "the patent claims do not require 7 character-at-a-time results because a system 8 that practices the claims does not return 9 results until the user enters a second search 10 string." 11 So would you agree that the claim 12 language where it says "updating the search 13 results as each successive character of the 14 first partial search string is received," you 15 would agree that that describes incremental 16 searching, wouldn't you? 17 MR. THACKER: Objection. Form. 18 A Could you just -- to make sure I 19 heard the part of the claim limitation that you 20 were quoting, could you just ask that again. 21 Q Sure. So the claim language, the 22 limitation, says, "updating the search results
190 1 declarations? 2 A Yes. 3 Q Thank you. So now I'd like to look 4 at the patents and the patent claims, 5 specifically. So let's look at the '139 patent 6 first. So if you could open that up. And, 7 again, that's Exhibit 1001, and for the '139, 8 that's Exhibit 1001 to the 255 IPR. 9 And once you have that, if you could 10 scroll down to claim 1. 11 A Sorry, give me a second. You said 12 '139 first? 13 Q The '139, yeah, let's do that one 14 first. 15 A Let me bring that up. 16 Okay. I have it open. 17 Q Okay. And I want to look at the last 18 limitation of claim 1, and that -- where I want 19 to focus is where it starts, "updating the 20 search results as each successive character of 21 the first partial search string and the second 22 partial search string is received respectively	192 1 as each successive character of the first 2 partial search string and the second partial 3 search string is received." 4 A In this case, in this part of the 5 claim, this particular limitation is talking 6 about a scenario where as a character is typed, 7 you are updating search results. So for this 8 particular limitation, I would characterize that 9 as incrementally updating the search results. 10 Q Okay. And is there a limitation that 11 says -- I'm sorry, I just want to make sure I 12 understand exactly what your answer was. You 13 said, "this particular limitation." So you 14 agree that this limitation describes incremental 15 or character-at-a-time searching over the first 16 partial search string, correct? 17 MR. THACKER: Objection. Form. 18 A Well, I think if you -- if we 19 continue to read this limitation, "updating the 20 search results as each successive character of 21 the first partial search string and the second 22 partial search string is received respectively."

193 1 And so I think if -- the thing that I 2 want to be careful about is if you look at the 3 preceding limitations, going back two 4 limitations, the limitation reads, "searching 5 for a first one or more documents each including 6 at least one string that corresponds to the 7 first partial search string; and searching for a 8 second or more documents each including at least 9 one string that corresponds to the second 10 partial search string; and then updating the 11 search results." 12 And so the way I would read this is 13 until you have actually received a second 14 partial search string, even though you have 15 received the first partial search string, you 16 know, you don't need to be updating the search 17 results until you receive the second partial 18 search string. So I think that is what I was 19 getting at in the sentence that you asked me to 20 quote and to read in my declarations. 21 Q So I want to drill down on that. Can 22 you point me to where in this claim it says that	195 1 claim is that you have two partial search 2 strings that are being received and -- right, 3 they are received, first, the first partial 4 search string and then the second partial search 5 string, and then you do these searches and 6 updates. 7 And so I think the way I understand 8 this is that you have to receive the second 9 partial search string before you can do the 10 update. 11 Now, once you receive the first and 12 the second partial search string, if you add 13 successive characters onto them, then you can 14 update one character at a time. I would 15 acknowledge that. 16 Q So you would agree that if I typed in 17 C as my first string and then, say, L as my 18 second string, each of those is a partial search 19 string, right, and then I go back and add an H 20 to the first string, are you saying then that 21 would be incremental or not? 22 MR. THACKER: Objection. Form.
194 1 you don't do any incremental searching on the 2 first string until you actually have a second 3 string in the search field, which is what I 4 think I understood you to just say? 5 MR. THACKER: Objection. Form. 6 A Well, I think -- the way I think you 7 would understand this claim is it says you have 8 to receive a first partial search string in a 9 first search field and then receive a second 10 partial search string in the first search field. 11 And then, as I said before, you do a search for 12 documents that include at least one string 13 corresponding to the first partial search string 14 and then you do a search corresponding for 15 documents that include at least one string that 16 corresponds to the second partial search string. 17 And it is only then that you can update the 18 search results. Well, and then you update the 19 search result as each successive character of 20 the first partial search string and the second 21 partial search string is received. 22 And so, again, the way I read this	196 1 A Would that be incremental? I 2 believe, setting aside -- I'm sorry, maybe -- 3 just looking at the claim language, I think in 4 that case, looking at the claim language, I 5 think the example you gave is a user already 6 entered a C for the first partial search string 7 and an L for the second partial search string, 8 and then they go back and enter an H on the end 9 of the first partial search string, so now you 10 have CH for the first partial search string and 11 an L. I think what the claim language tells me, 12 that after you entered the H, you would then 13 update the search results. 14 Q Let's turn back, then, to 15 paragraph 13. 16 A In any one of my -- 17 Q Any one of them. I believe that the 18 substance is the same across each of the three 19 declarations. So you pick whichever one you 20 want. 21 A I pick '490. It was the one that I 22 happened to be on.

197 1 Q Okay, that's fine. 2 A Okay. 3 Q In paragraph 13 -- and I'm going to 4 look along in the '490 as well just so we're in 5 the same document. In paragraph 13 you say that 6 "2002-era computers were entirely capable of 7 incrementally searching across a plurality of 8 files, especially with the help of indexes." 9 And then -- let's see, that's not what I'm 10 looking for. 11 Oh, I see. So toward the middle, 12 maybe closer to the end, you say, "The reality 13 is that then-existing databases were much 14 smaller." And you're referring to 15 Mr. Haeberli's database example size of 16 1 gigabyte. Do you see that? 17 A Yes. 18 Q You give an example. You say, 19 "E-mail databases were no more than ten 20 megabytes and were often between 2 and 4 21 megabytes." Do you see that? 22 A Yes.	199 1 are aware that back in the early 2000s POP was 2 the predominant e-mail protocol? 3 MR. THACKER: Objection. Form. 4 A I would have to take your 5 representation, because, as you point out, I 6 guess that's, like, 25 years ago, and I don't 7 recall that, yeah. 8 Q Okay. Well, let's pull up 9 Exhibit 1004, if you could. 10 A 1004, Schwartz, okay. 11 Q Yes. So this is Exhibit 1004 to each 12 of the three IPR proceedings. This is a book by 13 Steve Schwartz titled, Entourage for Macintosh 14 2001. And when you have that open, if you could 15 go to page 120, please. 16 A Okay, I have it open. And I will go 17 to page 120. 18 Okay, I'm there. 19 Q Okay. And on page 120 -- so this is 20 kind of a user guide to Entourage, the e-mail 21 platform. This is one of Microsoft's 22 references -- primary references in this
198 1 Q And then you reference a document 2 here, Exhibit 1095, that I would like you to 3 pull up from the file share, if you could. 4 A Uh-huh. Let me grab that. 5 Okay, I've got 1095. 6 Q Okay. And you cite page 1 of 7 Exhibit 1095 for the idea that Yahoo's pre-2004 8 e-mail database was 4 megabytes. 9 Do you see that? 10 A Right, right. 11 Q And you understand that Yahoo's -- 12 the e-mail database that's referred to in this 13 document is for the online Yahoo! Mail system, 14 correct? 15 A Yes. 16 Q Are you familiar with the POP, P-O-P, 17 e-mail protocol? 18 A Yes, I am, although it's been quite a 19 long time since I've thought about that, yeah. 20 Q You're aware that this was -- and, of 21 course, we're in 2026 now, so, you know, more 22 likely to use an exchange server today, but you	200 1 proceeding. And at the top of the page, it 2 talks about "Types of E-mail Accounts." 3 Do you see that? 4 A Uh-huh. Yep. 5 Q And then the next header down is "POP 6 accounts." And it says, "POP accounts are by 7 far the most common type of e-mail account." 8 Do you see that? 9 A Uh-huh. 10 Q So would you agree, based on this 11 reference -- Microsoft's own reference in this 12 case, that POP accounts in the 2001 time frame 13 were the most common type of e-mail account? 14 MR. THACKER: Objection. Form. 15 A I mean, that is what it says here. 16 Beyond that, as I said, I can't recall, but 17 that's what this says in this particular 18 reference. 19 Q And the third sentence of this 20 paragraph says, "When your e-mail client 21 (presumably, Entourage) connects with ISP's mail 22 server to check for new mail, it is sent to your

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1 Mac from a POP server. After you've received
2 the new mail, it is automatically deleted from
3 the server."
4 Do you see that?
5 **A Yes.**
6 Q So you would agree that for somebody
7 using Entourage for their e-mail -- they connect
8 to the server, download their e-mail, it's
9 deleted from the server -- that it's likely,
10 almost certain, that their local storage, their
11 e-mail stored locally, is a larger database than
12 whatever is on the server?
13 Would you agree with that?
14 MR. THACKER: Objection. Form.
15 **A Well, I'm not sure I know what you**
16 **mean by that. I mean, this is simply based on**
17 **how many messages -- certainly it's based on how**
18 **many e-mail messages someone would choose to**
19 **download and store as opposed to downloading,**
20 **reading and deleting.**
21 **And, I mean, my recollection is at**
22 **this time it was pretty common for people to,**

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1 **you know, store some messages, get their inbox**
2 **down to zero, maybe having, you know, I don't**
3 **know, a few dozen folders with some number of**
4 **messages in them stored. But it would just**
5 **depend on usage.**
6 **And so I think, you know, many e-mail**
7 **repositories, even if stored locally, would not**
8 **necessarily be bigger than what I said here,**
9 **4 megabytes. Yeah, it just -- it depends.**
10 Q It could be substantially bigger,
11 correct?
12 **A Oh --**
13 MR. THACKER: Objection to form.
14 **A Well, depending on how people**
15 **configure things, it could be larger, it could**
16 **be smaller than four megabytes, yeah.**
17 Q And I just want to go to paragraph --
18 page 121 quickly, just to close this loop here.
19 So on page 121, just to confirm, under
20 "Web-based accounts," the second paragraph talks
21 about Hotmail, also talks about Yahoo! Mail,
22 both offering POP support.

203
1 Do you see that?
2 **A Let's see, Yahoo! Mail offers POP**
3 **support. Does it say Hotmail? I'm just looking**
4 **for that.**
5 Q It may not expressly say it, but good
6 enough. You agree it says Yahoo! Mail is an
7 example of a server that has POP support, right?
8 **A It does say that, yes.**
9 Q Were you aware that the maximum
10 e-mail database size in Entourage 2001 was
11 2 gigabytes?
12 MR. THACKER: Objection. Form.
13 **A The maximum -- I don't recall right**
14 **offhand. I guess if you have that, you would**
15 **have to point me to that, yeah.**
16 Q Sure. So in the file download there
17 should be something titled "Entourage Help
18 Page."
19 **A I see that.**
20 Q If you could download that.
21 DR. LAROCHELLE: And we'll need to --
22 this is the only exhibit I'll need to mark, so

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1 we'll mark this as Exhibit 1 to the Terveen
2 deposition --
3 **A Okay.**
4 (Terveen Exhibit 1 marked for
5 identification and attached to the transcript.)
6 Q -- because this is not in evidence.
7 But what you should have is a Wayback
8 Machine archive web page -- Entourage Help Page,
9 and it is titled, "Size Limits"?
10 **A Uh-huh.**
11 Q And then at the bottom, "Entourage
12 2001 has a limit of 2 gigabytes on Databases and
13 Messages files. It does not handle this limit
14 gracefully. You may experience data loss if you
15 hit it."
16 Do you see that?
17 **A Yes.**
18 Q So if you are a user using Entourage
19 2001, downloading your e-mail from Yahoo! Mail,
20 using that as a POP server, you would agree that
21 your actual database size in Entourage 2001 was
22 2 gigabytes and not the 4 megabytes that you

205 1 reference in paragraph 13. 2 Do you agree with that? 3 MR. THACKER: Objection. Form. 4 A I think this is something -- again, 5 I'm just reading this document right now, and I 6 see "Entourage 2001 has a limit of 2 gigabytes 7 on both the Database and Messages file." And, 8 let's see -- and I think, as it says, sort of up 9 above, that the database file can include things 10 other than messages, for example, contacts, 11 events. And I'm not sure what all else can be 12 included in Entourage. 13 So if the -- I guess there is a 14 couple things I should be careful about. The 15 2-gigabyte limit might not be just for messages. 16 And then I think the other thing to point out 17 is -- well, maybe two other things -- that, of 18 course, is a maximum limit. That doesn't mean 19 that people actually are hitting that limit, 20 again, in practice. 21 And -- what was I going to say? And 22 I think if you -- if we go back to my	207 1 e-mail messages and still have a pretty small 2 e-mail database. 3 So I think we can talk about what 4 theoretical maximum e-mail database sizes were, 5 but I think we also need to really consider what 6 were typical or possible e-mail database sizes 7 as well. 8 Q Okay. But you do agree that the 9 maximum e-mail database size in a system like 10 Entourage is substantially larger than the 2 to 11 4 megabytes that you reference in paragraph 13? 12 MR. THACKER: Objection to form. 13 Scope. 14 A As I said, this is something that I 15 have not looked at specifically. You put this 16 document in front of me, The Entourage Help 17 Page, and all I can say -- all I can do is look 18 at what it said there and see that it indeed did 19 say in this page from The Wayback Machine that 20 "Entourage 2001 has a limit of 2 gigabytes on 21 both the Database and Messages file." 22 Q Okay. You can set that aside for
206 1 paragraph 13, if I remember, I think 2 Mr. Haeberli -- I know I mentioned somewhere 3 that he assumed that hard disk capacity was 4 about 1 gigabyte, which, a 2-gigabyte e-mail 5 database would exceed the hard disk capacity. 6 Oh, yeah, right. I see he says -- Mr. Haeberli 7 assumed a database size of 1 gigabyte. Yeah, 8 okay. Good. 9 So let me correct that. He assumed a 10 database size of 1 gigabyte. Yeah, I'll just 11 come back to say this says that that was a 12 maximum database size for Entourage in 2001. 13 And I think I'll come back to what I 14 said before, that that doesn't mean that any 15 particular database size for a mess- -- e-mail 16 database size for a particular user was anywhere 17 close to that. And if I look at the second 18 sentence in this paragraph, I gave an example 19 where I said the median size of two e-mails in 20 2002 was about 4.4 kilobytes. And if you think 21 of an e-mail message being, you know, a couple 22 kilobytes in length, you can have hundreds of	208 1 now. At your first deposition we talked a 2 little bit about the size of an index and how 3 index size might impact the time it takes to 4 search for documents. Do you remember that? 5 A Yes. 6 Q Would you agree that -- I'm going to 7 give you a hypothetical. So let's say you have 8 one data set -- maybe it is a set of files, 9 e-mails, whatever it is -- and you have two 10 different systems that can search. And they 11 both do indexed search. One can do an 12 incremental search. The other system only does 13 a delimited search, meaning on full search 14 terms. I think we talked about that at your 15 last deposition as well. 16 Do you understand the hypothetical? 17 A Yes. 18 Q So in that hypothetical, would you 19 agree that the index for the system that 20 performs incremental searches is necessarily 21 larger than the index for the system that does 22 delimited searching?

209 1 A No, it does not have to be 2 necessarily larger. 3 Q Can you give an example of an index 4 that would not be larger? 5 A Yes, I – you know, this – yes, I 6 touch on this in my supplemental replies. So 7 this will be just slightly technical, but if you 8 take the case of a standard inverted index, 9 where you have the words, the terms that you 10 might search for – and let's say these are 11 whole words – are the keys to the index. And 12 the values would contain at least the files that 13 those words occurred in and maybe the position 14 in each of those files. Could be other things 15 as well but at least that. 16 If I were receiving a partial search 17 string, or let's say I want to search 18 incrementally as I receive a search string, as I 19 receive characters, I could take the search 20 string that I have received so far and compare 21 that against the keys in the index, that is, the 22 words that had been indexed, and I could find	211 1 Okay. Yeah. 2 Q There you state -- I'm actually going 3 to go to the very last sentence of paragraph 64. 4 You state, "Further, a system that indexes only 5 whole words inherently indexes prefixes because 6 common words that would be indexed in any system 7 (e.g., the word 'a') are prefixes for other 8 words (e.g., 'an,' 'and,' 'Andrew,' et cetera)." 9 Do you see that? 10 A Yes. 11 Q I'm trying to understand kind of the 12 scope of what you're stating here. Are you 13 suggesting that every prefix is a common word 14 that would be indexed in any system? 15 A No. No, I'm not suggesting that. 16 Q Okay. So let's just take a -- as a 17 quick example, let's consider the word 18 "declaration." 19 A Uh-huh. 20 Q And in a prefixing index type system, 21 if you were going to index "declaration," would 22 you agree that you would need to index D, DE,
210 1 all of the words that that search string so far 2 was contained in. And now all of the files that 3 they appeared in would be potential matches. 4 So it would be -- so the index would 5 be a standard inverted index, but the procedure 6 I would use for searching it would be a bit 7 different. 8 Q Is this a system that was known in 9 2004, what you just described? 10 A Yeah, this is the kind of thing that 11 I believe Baeza-Yates would talk about. It is 12 just a standard sort of thing where, you know, 13 you -- you take your search string and you 14 compare it to the words in the index, and, 15 obviously, you could simply find a -- you can 16 find an exact match or you can do this partial 17 match thing, so, yeah, I think that was known. 18 Q So while we're talking about indexing 19 for incremental search, let's turn to 20 paragraph 64. I'm looking at your '490 21 supplemental declaration. 22 A 64, okay, yes.	212 1 DEC, DECL, and so on and so forth? 2 MR. THACKER: Objection. Form. 3 A Well, I think we would have to look 4 back to see -- so I want to go back to the 5 beginning of paragraph 64. I say, "Moreover, 6 the claims do not recite indexing prefixes." 7 Okay, so that's the first thing. And even if 8 they did, indexing prefixes was known in the art 9 so I already explained that. 10 And then -- so then coming back to 11 your example of the word "declaration," I think 12 the question has to be refined a little bit. 13 You just presented a scenario where literally 14 every prefix is required to be indexed. And so 15 I think, by definition, if you state a 16 requirement where every single prefix of every 17 single word must be indexed, then, by 18 definition, it has to be indexed. But that's -- 19 as I said, the claims don't require that. And 20 as I said also, there are techniques known for 21 indexing prefixes, so, yeah. 22 Q Okay. But my question wasn't about

213 1 these claims. I was asking about the word 2 "declaration" in a system that indexes prefixes. 3 And so to accomplish true incremental search in 4 a system that uses prefixes, how many entries 5 would the word "declaration" need if you were 6 going to accommodate all of the prefixes? 7 MR. THACKER: Objection. Form. 8 A I think that question you -- you used 9 the term "uses prefixes," and I want to be 10 careful about that because just a few minutes 11 ago I gave you an example of how you could do 12 searches for prefixes in a system that did not 13 index prefixes but it would do this matching of 14 what could be prefixes to whole words in the 15 index. 16 So if you mean -- again, if you mean 17 a system -- you're specifying a system where 18 literally the requirement is that every prefix 19 of every word must be somehow indexed, then you 20 would have to have a way to index, for 21 "declaration," D, DE, DEC, DECL and so on. 22 So however many that would be all the	215 1 not review the entirety, but I reviewed -- I 2 think perhaps at least reviewed more carefully 3 additional parts that I may not have done for my 4 initial declaration. 5 Q Did you cite every portion of the 6 Raskin reference that you reviewed in preparing 7 your declarations? 8 A I think I cited every -- the parts -- 9 well, what I certainly tried to do is cite every 10 part of the Raskin declaration both in my 11 initial -- first in my initial but then in my 12 supplemental that I relied on. 13 Q Who determined which sections of 14 Raskin you would review? 15 MR. THACKER: Objection. Form. 16 Scope. 17 A Well, I certainly had 18 conversations -- 19 MR. THACKER: Loren, before you 20 answer this, I just want to pause and say in 21 advance I object to the extent that this 22 question invokes any privileged or confidential
214 1 way up to "declaration," yeah. 2 Q Okay. Thank you. You can set that 3 aside. 4 At your first deposition you 5 testified that you relied on the Raskin 6 reference for the idea of incremental search. 7 Do you remember that? 8 A Yes. 9 Q When you prepared your initial 10 declarations, did you review the entire Raskin 11 reference? 12 MR. THACKER: Objection. Form. 13 Scope. 14 A I don't recall if I reviewed it all. 15 I obviously -- at the time when I prepared my 16 initial declaration, the parts that I relied on 17 for my opinion, I cited to. 18 Q In preparing your supplemental 19 declarations -- yeah, in preparing your 20 supplemental declarations, did you review the 21 entirety of the Raskin reference? 22 A In preparing my supplemental, I did	216 1 communications. And, Loren, I would caution you 2 to not divulge any privileged or confidential 3 communications. 4 THE WITNESS: Okay. 5 DR. LAROCHELLE: I'll strike that and 6 reword, if it will make you more comfortable. 7 BY DR. LAROCHELLE: 8 Q Did you determine which portions of 9 Raskin you would review? 10 A Certainly, yes. And I think one of 11 the things for my supplemental that triggered 12 that was looking at some of the points 13 Mr. Haeberli had made and, you know, looking, I 14 guess, a little more extensively at Raskin to -- 15 I guess actually to provide more details where 16 he had questioned things about what Raskin 17 taught, yeah. 18 Q Did you consider whether any portion 19 of the Raskin reference, aside from the pages 20 that you actually cited, might teach away from 21 incremental search across multiple documents? 22 A Not that I'm aware of, no.

Transcript of Loren G. Terveen, Ph.D., Volume II
Conducted on March 24, 2026

10 (217 to 220)

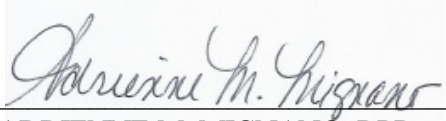
217 1 DR. LAROCHELLE: Can we take a 2 five-minute break -- 3 THE WITNESS: Sure. 4 DR. LAROCHELLE: -- and go off the 5 record? 6 MR. THACKER: Sounds good. 7 (A recess was taken.) 8 BY DR. LAROCHELLE: 9 Q Welcome back. So before the break, 10 we were talking about the Raskin reference. 11 Do you remember that? 12 A Yes. 13 Q And I asked you whether you 14 considered other portions of the Raskin 15 reference aside from those that you cited, 16 right? 17 A You did ask me that, yes. 18 Q And you said that you had -- I want 19 to make sure I understand what you said. You 20 said that you had reviewed other portions and 21 that you cited the portions that you thought 22 were relevant. Is that what you said? Was that	219 1 ACKNOWLEDGMENT OF DEPONENT 2 3 I, LOREN G. TERVEEN, Ph.D., do hereby 4 acknowledge that I have read and examined the 5 foregoing testimony, and the same is a true, 6 correct and complete transcription of the 7 testimony given by me and any corrections appear 8 on the attached Errata sheet signed by me. 9 10 _____ 11 (Date) (Signature) 12 13 14 15 16 17 18 19 20 21 22
218 1 your testimony? 2 A Yes. Yes, as in I started in the 3 chapter that seemed most relevant, for example, 4 and I would look through parts of it. And then 5 there were parts that did turn out to be 6 relevant that I would cite and other parts that 7 I had read that I may not have cited, so yeah, 8 that's how it worked. 9 Q Do you recall reading about LEAP, 10 L-E-A-P, in the Raskin reference? 11 A Not right offhand, no. 12 Q And that isn't something that you 13 relied on in your declaration, correct? 14 A Not that I recall. No. 15 DR. LAROCHELLE: I have no further 16 questions. I pass the witness. 17 MR. THACKER: No redirect. 18 DR. LAROCHELLE: Then we're done. 19 Thank you very much for your time, Dr. Terveen. 20 THE WITNESS: Thank you. 21 MR. THACKER: Thanks, all. 22 (Time noted: 11:56 a.m.)	220 1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC 2 3 I, ADRIENNE MIGNANO, Certified 4 Reporter and Notary Public within and for the 5 State of New York do hereby certify: 6 That LOREN G. TERVEEN, PH.D., the 7 witness whose deposition is hereinbefore set 8 forth, was duly sworn by me before the 9 commencement of such deposition and that such 10 deposition was taken before me and is a true 11 record of the testimony given by such 12 witness. 13 I further certify that the all 14 parties were represented by counsel at the 15 deposition. 16 I further certify that the 17 deposition of LOREN G. TERVEEN, PH.D., 18 occurred remotely via Zoom Videoconference on 19 Tuesday, March 24, 2026, commencing at 20 11:00 A.M. to 11:56 A.M. 21 I further certify that I am not 22 related to any of the parties to this action

Transcript of Loren G. Terveen, Ph.D., Volume II
Conducted on March 24, 2026

11 (221 to 224)

221

1 by blood or marriage, I am not employed by or
2 an attorney to any of the parties to this
3 action, and that I am in no way interested,
4 financially or otherwise, in the outcome of
5 this matter.
6 IN WITNESS WHEREOF, I have hereunto set my
7 hand this 31st day of March, 2026.
8 My commission expires: June 2026

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12 _____
13 ADRIENNE M. MIGNANO, RPR
14 NOTARY PUBLIC

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