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 1   IN THE UNITED STATES DISTRICT COURT
                       FOR THE DISTRICT OF COLUMBIA
 2
      United States of America,   )
 3   et al.,   ) **FOR NON-PARTY APPLE ONLY**
)
 4   Plaintiffs,) Civil Action
) No. 20-cv-3010
 5   vs.) Washington, D.C.
) September 22, 2023
 6   Google LLC,   ) 9:30 a.m.
)
 7   Defendant.)
      _____)
 8

 9   TRANSCRIPT OF BENCH TRIAL
                  BEFORE THE HONORABLE AMIT P. MEHTA
10   UNITED STATES DISTRICT JUDGE

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1   * * * * * * *P R O C E E D I N G S* * * * * * *

2   (The following proceedings were held in closed

3   session, with Apple counsel present:)

4   THE COURTROOM DEPUTY: Good morning, Your Honor.

5   This is civil action 20-3010, *United States of America et al.,*

6   *versus Google, LLC.* Kenneth Dintzer and William Cavanaugh for

7   the government. John Schmidtlein on behalf of Google.

8   THE COURT: All right. Good morning, everyone.

9   Thank you for your patience. All right.

10   So we're ready to go, Mr. Dintzer. Good morning and

11   welcome, Mr. Dintzer.

12   MR. DINTZER: Good morning. Thank you, Your Honor.

13   And to start off, Your Honor, we would like to push

14   in the two demonstratives we used yesterday, UPXD0005 and

15   -0004.

16   MR. SCHMIDTLEIN: No objection.

17   THE COURT: They'll be admitted.

18   DIRECT EXAMINATION (Cont.)

19   BY MR. DINTZER:

20   Q. So, sir, where we left off, we were talking about the fact

21   that Apple has two defaults on Safari, one for regular browsing

22   one for private browsing, right?

23   A. That's correct, in iOS 17.

24   Q. Right. And out of the box, they both default to Google?

25   A. They second one defaults to whatever the first one is

1   selected.

2   Q. And the first one defaults out of the box to Google?

3   A. Correct.

4   Q. And what is Spotlight?

5   A. Spotlight is a -- mostly on-device search feature in iOS

6   devices.

7   Q. Okay.

8   MR. DINTZER: And I'm going to hand out another

9   demonstrative. May I approach, Your Honor?

10   THE COURT: Yeah.

11   MR. DINTZER: While I'm doing this, we're going to

12   hand up binders for the exhibits.

13   BY MR. DINTZER:

14   Q. Sir, this is a two-page demonstrative. If you look at the

15   first page, what am I looking at here?

16   A. This looks like somebody had just invoked Spotlight on an

17   iPhone.

18   Q. Okay. And Spotlight can be gained from a number of ways

19   from the home page; is that right?

20   A. That's correct.

21   Q. A swipe? Like, a swipe down, a swipe left; is that right?

22   A. That's correct.

23   Q. Okay. And as you said, Spotlight is focused on finding

24   content on the device first, and then falling back to other

25   devices -- I mean, other search?

1   A.   Yes. It's intended to be sort of a universal search that

2   looks at your own device, but can look up information further

3   afield.

4   Q.   And when we use the term "falling back," that's one you're

5   familiar with?

6   A.   Sure.

7   Q.   And what does it mean?

8   A.   It means that if you may want to gather information from

9   what I call further afield. So maybe not from an app on your

10   device, but from a service from Apple or from a service from a

11   search provider.

12   Q.   And Spotlight shows the results on the screen, right? It

13   doesn't talk? And if you turn to the second page of this

14   demonstrative.

15   A.   Yes. It displays results visually.

16   Q.   But Spotlight is not a general search engine, right?

17   A.   Not by my definition, no.

18   Q.   Because it doesn't search the web, primarily.

19   A.   Not primarily, but it -- I think of it as sort of a

20   universal search. You can search the web with it, if you want

21   to, but it doesn't display web results as its first instance.

22   Q.   And, in fact --

23   MR. DINTZER: No further questions on that document,

24   Your Honor, we would like to move in UPXD006.

25   THE COURT: It will be admitted.

1   BY MR. DINTZER:

2   Q.   Apple does not operate a general search engine, correct?

3   A.   No, we do not.

4   Q.   Has Apple made the decision to never develop its own

5   general search engine?

6   A.   No, we have not made such a decision.

7   Q.   Now, I would like to talk about sort of the elements of a

8   general search engine. I'm going to put GSE up here.

9   The first one I think you mentioned to us in the

10   deposition is crawling; is that right?

11   A.   That's correct.

12   Q.   And the Court's heard some, but just one sentence or two on

13   crawling. What is it?

14   A.   Well, step one on building a general search engine would be

15   to take a copy of as much of the web as you can.

16   Q.   And how does crawling do that?

17   A.   It starts with a list of websites and then it crawls the

18   HTML on those websites and then it looks at the links inside of

19   those web pages and then recursively crawls them. So by doing

20   this, you can get a copy of the most of the web.

21   Q.   And sometimes that's called a bot that's doing the

22   crawling; is that right?

23   A.   Yeah. Usually it's called a crawling bot, yes.

24   Q.   And Google crawls the web; is that right?

25   A.   They do.

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1     Q.   And data -- user data plays a role in crawling the web; is

2     that right?

3     A.   Well, one of the most important problems is the order in

4     which you crawl the web.  So, for example, a popular website

5     like New York Times you might want to crawl more frequently

6     than a website which is rarely accessed.

7     Q.   And user data can help a search engine figure out which

8     places to crawl more or less frequently?

9     A.   Yes.

10    Q.   Now, no search engine has a copy of the entire web.  It's

11    too big.

12    A.   That's correct.

13    Q.   Now, Apple crawls the web.

14    A.   We do.

15    Q.   And Apple has been crawling the web since 2014; is that

16    right?

17    A.   That sounds broadly correct, yes.

18    Q.   And in 2020, Apple only crawled          ; is that right?

19    A.   That sounds right.

20    Q.   And that number would represent how many distinct pages

21    it's crawling?

22    A.   I can't say, but, you know,        , I would say.

23    Q.   Since 2020, Apple has                          its crawl; is

24    that true?

25    A.   Yes.  One of the things we've been doing is increasing the
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1   size of the Apple bot crawl.

2   Q.   At the time of your deposition, you told us that Apple had

3   crawled ███████ pages; is that right?

4   A.   That sounds likely, yes.

5   Q.   How about today, what are we at now?

6   A.   I actually don't know that number, but it's probably

7   slightly higher.

8   Q.   Now, Apple crawls the web for a number of reasons. Apple

9   has several products that depends on having knowledge of the

10   web; is that right?

11   A.   That's correct.

12   Q.   And what are those products?

13   A.   There's quite a few. Obviously, Spotlight is one, Safari

14   Search is another. But we use the web crawl for many different

15   things, including improving how your keyboard suggestions work

16   on an iPhone.

17   Q.   And unfortunately, Apple uses a lot of S words to describe

18   its bot. So I'm just going write them here, just so we keep

19   them straight. Spotlight is on device, Safari is the browser.

20   And you mentioned Suggestions. What's Suggestions?

21   A.   Suggestions in Safari. So those two are related, yeah.

22   Q.   I'll use that as a dash then, as a sub to Safari.

23   Is Suggestions the thing when I start typing, it pops up

24   with a suggestion of the website I might want to go to?

25   A.   Yeah. In a modern web browser, people can do the searches

1 in the URL bar, the bar at the top of the browser. And when

2 you start typing there, character by character, most modern

3 browsers give you suggestions. And those might be websites or

4 they could be queries that are popular.

5 Q. And Safari and Spotlight depend on Apple's having a

6 knowledge of the web?

7 A. Yes.

8 Q. What's a natural language model, in one sentence --

9   THE COURT: Sorry to interrupt.

10   Can I just ask a clarification? The suggestions that

11 pop up, are they popping up as a result of the search engine or

12 the browser? Or maybe it's both?

13   THE WITNESS: It's a combination. So the suggestions

14 that pop up in Safari are coming from Apple, and they're

15 interleaved with suggestions coming from Google.

16   THE COURT: They're -- I'm sorry --

17   THE WITNESS: Interleaved with suggestions coming

18 from Google.

19   THE COURT: I see.

20   THE WITNESS: So it's a fairly complicated process,

21 but we are trying to guess what you might be looking for.

22   THE COURT: Gotcha. Okay.

23   MR. DINTZER: And in a couple minutes, Your Honor,

24 we'll have a demonstrative to help show this.

25   THE COURT: Okay.

1 BY MR. DINTZER:

2 Q. Very briefly, what's a natural language model?

3 A. A natural language model is a machine-learned model that

4 tries to understand language, like English.

5 Q. And part of Apple's crawl on the web is to develop its

6 natural language models?

7 A. In recent years, yes, that's been one of the uses for it.

8 Q. So after crawling the web, the next thing on my list is

9 indexing, right? Is that part of developing a general search

10 engine?

11 A. Yes.

12 Q. Okay. And two sentences on indexing, sir?

13 A. Well, you need to convert the web crawl into something

14 which we call a serving index, and so that process is called

15 indexing. And typically, the serving index is smaller than the

16 web crawl.

17 Q. Okay. So the web crawl is taken, and basically the results

18 of the crawl are indexed in a certain way; is that right?

19 A. Yes, that's correct.

20 Q. It's the order of the indexing that matters, right?

21 A. What you include in the index matters a lot, yes.

22 Q. How about the way that it's stored in the index, does that

23 affect how quickly it can be brought up?

24 A. Yeah. Different search engines implement this in different

25 ways, but it's a critical part of the search implementation,

1   yes.

2   Q. Okay. And how is user data used in the indexing process?

3   A. In a few ways, but it's not as important as how the

4   indexing is implemented.

5   Q. Does the user data help in knowing whether to index things

6   so that they can be obtained quickly, as opposed to maybe take

7   a little bit longer?

8   A. By "user data," do you mean the usage of the subsequent

9   search engine?

10   Q. Click data. The -- we should probably agree on a term,

11   sir. A term to describe the signal from user clicking on the

12   web page, is there a term that you prefer to use?

13   A. Well, the click signal is not particularly important for

14   indexing, but the number of queries are.

15   Q. Okay. How so?

16   A. Because you would want to make sure that you had covered

17   queries that you see frequently.

18   Q. And Google index is the stuff that it crawls; is that

19   right?

20   A. Yes, of course.

21   Q. Google has a massive index; is that correct?

22   A. It last a pretty big index, yes.

23   Q. And to run a modern search engine, the index needs billions

24   of web pages?

25   A. Could you restate the question?

1 Q. Of course.

2   To run a modern general search engine, the index needs

3 billions of web pages.

4 A. Yes. More web pages in your index is better.

5 Q. We're talking about tera -- I may not have the right --

6 terabytes of information; is that right?

7 A. Probably not in the serving index, but in the crawl, for

8 sure.

9 Q. And Apple maintains an index of the web; is that right?

10 A. We do.

11 Q. And I think I got this right: Apple has ███████ pages

12 served on its index; is that right?

13 A. Yeah, in recent years we've grown our index size to be

14 about ███████ pages.

15 Q. In fact, more recently it's been growing ████████████

16 ██ .

17 A. We've been investing in it, yes.

18 Q. And that's based on your recommendation that Apple invest?

19 A. Yes. Because if something is not in the index, then it's

20 not going to surface it in a web search.

21 Q. That's been a ████████████████████████ for Apple,

22 correct?

23 A. I would say so, yes.

24 Q. Very briefly, very briefly, because I know this could go

25 on, what is machine learning?

1 A. Machine learning is a branch of computer science where

2 instead of writing a computer program, you write a program that

3 learns from data.

4 Q. It involves teaching computers how to do things, rather

5 than programming them to do things.

6 A. That's a fair expression, yeah.

7 Q. And search engines benefit from aggressive use of machine

8 learning.

9 A. I wouldn't agree with "aggressive." Historically, search

10 engines like Google have avoided using machine learning, and in

11 recent years, maybe the last five years, the ratio of machine

12 learning has been growing.

13 Q. And am I right that historically, Bing used more machine

14 learning than Google?

15 A. That's my understanding, yes.

16 Q. You believe machine learning was an important part of a

17 search engine, right?

18 A. I do.

19 Q. And you did when you were at Google.

20 A. Yeah. And I advocated for putting more machine learning

21 into Google Search.

22   THE COURT: Can I -- you said historically search

23 engine's have avoided machine learning.

24   THE WITNESS: Yes.

25   THE COURT: Can you explain why that is?

1   THE WITNESS: There's a number of reasons. One is

2   that machine learning is kind of hard to explain why it works,

3   so it's not very explainable. So when I was at Google in 2010,

4   2011, the people in charge technically of Google really

5   resisted putting machine learning into the Google algorithm

6   because they didn't want it to be a black box. And over time,

7   it became obvious that machine learning was so good at language

8   understanding that it was going to be critical to the future of

9   search.

10   And, so, now I think Google has made a number of

11   public statements that they put significant amount of machine

12   learning into Google Search now. But that was not true in

13   2010.

14   BY MR. DINTZER:

15   Q. Or 2015, for that matter.

16   A. I don't remember the first launch we made, but it was

17   probably about 2015, 2016 when we launched something called

18   RankBrain when I was there at Google.

19   Q. And that was the first machine learning effort?

20   A. It was the first major deep learning effort in Google

21   Search that I recall, yes.

22   Q. And even when Google launched that, it still used items

23   such as Nav Boost to do a lot of the heavy lifting on search;

24   is that right?

25   A. Yeah, the core part of search, apart index retrieval, is

1   ranking, and ranking uses, when I was at Google, maybe 200

2   signals, one of which is Nav Boost.

3   Q. Nav Boost is an important one?

4   A. It was considered very important, yes.

5   Q. We're on a Knowledge -- what is a Knowledge Graph?

6   A. A Knowledge Graph is a large structured repository of what

7   I would call common sense knowledge. So, all the teams in the

8   NFL, all the actors and actresses in movies, as much as you can

9   write down the computer should know.

10 Q. An example would be: What's the population of Palo Alto?

11 A. Yeah, that would be a good example.

12 Q. Sources for the Knowledge Graph can include licensed

13 structured data feeds; is that right?

14 A. Yeah. I mean, the technical aspect of a Knowledge Graph is

15 you bring together lots of different data fees into one

16 canonical format.

17 Q. Google had a Knowledge Graph, right?

18 A. Yes.

19 Q. You helped develop that Knowledge Graph?

20 A. Yes.

21 Q. And the Knowledge Graph was information used by Google

22 Search to respond to queries, right? So if I asked the

23 question: What's the population of Palo Alto, it will use the

24 Knowledge Graph?

25 A. Broadly speaking, if you see an answer like that, it's

1   probably coming from the Google Knowledge Graph.

2   Q. And, now, you're responsible for guiding the development of

3   a Knowledge Graph product at Apple?

4   A. That's correct.

5   Q. And the Knowledge Graph at Apple relies, in part, on

6   Apple's search index, right?

7   A. It relies on a large number of inputs, yes.

8   Q. Of course. But one of them is Apple's index.

9   A. That's correct.

10   Q. Okay. And the Knowledge Graph can't answer every query a

11   search engine like Google gets, right, if that's sort of just

12   for kind of information kind of queries; is that right?

13   A. It's for what I would call head queries, things where you

14   expect the search engine to have that factual data.

15   Q. And we'll get back to the head -- in a bit, sir.

16   When you have -- now, you started to talking about this

17   with the Court, and I just want to fill in some of the blanks.

18   When you have a search box in a product, you start

19   typing characters, you may get suggestions, right?

20   A. That's correct.

21   Q. And Apple has -- Apple Safari has a function called

22   Suggestions.

23   A. Safari Suggestions, yes.

24   Q. Okay. And so let's go to --

25   MR. DINTZER: I'm going to hand out -- if I may, Your

1   Honor, approach, I'll hand out UPXD007.

2   BY MR. DINTZER:

3   Q. So on Safari -- let's go to the first picture here on --

4   actually, it's just one page of a demonstrative.

5   What are we looking at here in this demonstrative?

6   A. This looks like somebody is in Safari starting to type a

7   search.

8   Q. And they've gotten up to running SNE; is that right?

9   A. It looks like that, yep.

10   Q. And so it's seeing two things here. We're seeing the top

11   says running shoes, and then nike.com, right?

12   A. Yes.

13   Q. What is that?

14   A. That's what we would call a navigational suggestion.

15   Q. And that comes from Apple?

16   A. That comes from Apple.

17   Q. That comes from Apple's either Knowledge Graph -- that

18   comes from its ability to answer questions.

19   A. That's coming from the search index, yeah.

20   Q. The search index.

21   And then below that it says "Google Search," and then it

22   has a number of options. And where are those coming from?

23   A. Those are coming from Google's suggestion service.

24   Q. The running shoes nike.com, that is Apple's suggestion,

25   right?

1   A.   That is an Apple suggestion, yes.

2   Q.   And suggestions is an attempt to guess what the query is

3   asking for and to provide the right path to the answer.

4   A.   Yes.   There's a number of different kinds of suggestions.

5   This happens to be a website navigational suggestion.

6   Q.   If I hit that button with my finger, what's going to

7   happen?

8   A.   You're going to go to that website.

9   Q.   I'm not going to have to go to a search -- we're going to

10   get to search engine result page.   I'm not going to have to go

11   to a search engine result page, am I?

12   A.   No.   You would go right to that website.

13   Q.   I could bypass Google if I hit that button.

14   A.   That's one way of putting it.

15   Q.   Okay.

16   THE COURT: I'm sorry.   Can I ask if this -- I don't

17   know whether this is an actual search or not, but why does the

18   navigational suggestion come up with only one company versus

19   ten?

20   THE WITNESS: This would be based on our

21   understanding of what people typically clicked on when they

22   clicked on one of the Google suggestions.   So it's -- we try

23   very hard to make it the most likely thing.   So, for example,

24   if you typed in, you know, AMZ, we would put up Amazon.   So we

25   try to pick one thing which you might click on, and we measure

1 very rigorously whether it was actually selected by user or

2 not.

3   THE COURT: Okay. And is this user-specific or this

4 is just a aggregation of data that attempts to predict what any

5 particular user might want?

6   THE WITNESS: It's currently an aggregation in a

7 given country.

8   THE COURT: Gotcha. Thank you.

9 BY MR. DINTZER:

10 Q. So if I typed this in some other country, I might get

11 something else?

12 A. Of course.

13   THE COURT: If you're in Europe, you might get Adidas

14 first?

15   THE WITNESS: That's correct.

16   MR. DINTZER: Or Puma.

17 BY MR. DINTZER:

18 Q. So Apple is using its data, its knowledge, about what

19 people have done in the past to figure out which one -- which

20 suggestion it wants to surface; is that right?

21 A. Yeah. That's an important signal, yes.

22 Q. Apple spends money to crawl the web and index it to improve

23 its Knowledge Graph, correct?

24 A. We do.

25 Q. And Apple does this so it can get answers to questions as

1   quickly as possible.

2   A.   Yes. Our general approach is we think users of our devices

3   are seeking answers, and so if we can provide the answer, we

4   will do that rather than sending them off to a general search

5   engine.

6   Q.   Apple crawls the web and indexes it so Apple can protect

7   user privacy when possible?

8   A.   That's one of the motivations, yes.

9   Q.   Apple believes if a user has an information need, if Apple

10   has a property that has the answer, Apple would like to surface

11   the answer rather than send you off to a general web search.

12   A.   Generally that's true, yes.

13   Q.   Apple does not compete with Google for queries.

14   A.   I'm not sure I would agree with that characterization

15   because every query that we provide an answer to is a query

16   that doesn't go to Google.

17   Q.   So Apple does compete with Google for queries?

18   A.   For the information intent of the user, yes, I would say we

19   do.

20   Q.   So when you say "information intent," do you mean the data

21   that is retrieved from the user or do you mean actually being

22   able to answer the query?

23   A.   Think about if a user is looking for a score from a game

24   from last night, if we have that score, we will give it to the

25   user. The user will never end up on the general search engine.

1   Q.   Apple does not sell ads as part of its Siri suggestions,

2   right?

3   A.   We do not.

4   Q.   Are you aware that under the Apple-Google contract, that if

5   ██

6   ██?

7   A.   I'm not aware of the details of the Apple-Google contract.

8   Q.   You do not know that specific detail?

9   A.   I do not know that specific detail.

10   Q.   Is Apple trying to complete with the general search engine

11   to answer queries?

12   A.   We're trying to build the best user experience we can, and

13   sometimes that means providing answers to users' questions.

14   Q.   The next thing, and I mentioned it, what's a SERP?

15   A.   A SERP is generally considered to be what's called the

16   search engine response page. So that would be the broad answer

17   from a general search engine. In the old days, people called

18   those 10 blue links, the list of links that you could look at

19   when you typed in a query.

20   Q.   That's when you -- what you see when you -- for any search,

21   right, if you see a page that pops up with a series of answers

22   and web results?

23   A.   If you go to a general search engine and you type in a

24   query, you're expecting to see something that looks broadly

25   like a SERP.

1   Q.   Okay. And the SERP can include web links like you

2   described, but it can also have nonweb elements; is that right?

3   A.   Yeah. Increasingly, over the last ten years or so, I would

4   say the SERPs now have more knowledge-like answers at the top

5   of the page.

6   Q.   So if I ask how old is Steph Curry, I'll get some links,

7   but I may also get the information at the top?

8   A.   You're very likely to get the answer at the top, probably

9   from a knowledge graph.

10   Q.   And sometimes the SERP returns a structured feature, is

11   that right, a search feature?

12   A.   Yes. There are all kinds of query categorizations. Some

13   of them are what we would call lists. So you said best car or

14   best minivans or something, most regular search engines would

15   show you a list of choices.

16   Q.   So the first thing I would see, maybe, before I got any

17   blue links would be some informing about the Ford F-150 or

18   whatever the top five are, and then we would see the links?

19   A.   Yeah. It depends on the implementation of the search

20   engine. They're all different. But broadly, yes.

21   Q.   SERPs are mostly a linear sequence of search results; is

22   that right?

23   A.   My definition of a search engine result page is anything

24   that you see after you type a query. So it could include that

25   Steph Curry answer. It could include lists. It could include

1   other queries like this. It is all part of the SERP these

2   days, the modern search engines.

3   Q. And of course Google offers a SERP at then end. When you

4   put in your information, that's what you're getting at the

5   other end?

6   A. That's the core product of Google Search, is a SERP.

7   Q. Does Apple offer a SERP?

8   A. We do not today, no.

9   Q. Safari Suggestions is not a SERP?

10   A. I wouldn't define it as such, no.

11   Q. Because it shows either a list of alternatives or a single

12   answer for the result, right?

13   A. Yeah. The way I think about it is that we are getting the

14   first bite at the apple, so to speak. We're intercepting every

15   query you're trying to do and trying to decide whether we can

16   help.

17   Q. What is -- I'm going to change gears here.

18   What is Topsy?

19   A. Topsy is the code name for an acquisition that Apple did

20   before my tenure there.

21   Q. And was that around 2014?

22   A. I think that's about right.

23   Q. And is that a search engine?

24   A. It was a kind of search engine that was mostly focused --

25   it was focused, at the time, on searching social media, is my

1   understanding. But it was acquired by Apple to increase their

2   investment in search, is my understanding.

3   Q. What is ███████

4   A. It's an internal code name for ████████████████████

5   Apple's search engine.

6   Q. So, when Apple acquired the product from Topsy, it renamed

7   it ███████

8   A. No, no. The way I would think about it is that Topsy ███

9   ██.

10   Q. If you disagree with anything I write or my spelling, just

11   let me know.

12   A. Sure.

13   Q. So -- well, I'm sorry. So this is ████████████████████.

14   And were you there when ██████ was being used?

15   A. Yeah. I would say I started the ██████ project at Apple.

16   Q. That was started in, what, 2018?

17   A. Yes. We did an acquisition of a company called Laserlike,

18   ██.

19   Q. What is ███████

20   A. ███

21   ███████

22   Q. So ████████████████████████████████

23   A. Yeah. Let me correct myself. I believe that the Topsy

24   implementation was also called ██████ but in my tenure at

25   Apple, ████████████████████████████████.

1   Q.   So -- and I appreciate that because we want to be clear.

2   But just so we get this right, Topsy gave Apple sort of their

3   entry into search, and ██████████, that's when you came. You

4   sort of ██.

5   A.   ██.

6   Q.   ██

7   ████████████████?

8   A.   ██

9   ██

10   ████████████

11   Q.   So if we were going to refer -- actually, looking for a way

12   to refer to Apple search. Should I refer to it as ██████████

13   A.   Yeah, that would be fine.

14   Q.   Okay. ██

15   ████████████████?

16   A.   ████████████████████████████████.

17   Q.   And let's go to UPX1123. Sir, you'll find that in your

18   binder. I'll also put it up on the screen. So whatever

19   implementation you find most comfortable, please.

20   Sir, do you recognize this document?

21   A.   I'm not currently finding this in this binder.

22   Q.   I'm sorry, sir?

23   MR. SCHMIDTLEIN: It may not be in this binder.

24   MR. DINTZER: Okay. I apologize, Your Honor.

25   Thank you, Counsel.

1   Sir, actually, it was a mistake.

2   May I approach?

3   And this is two pages. It's double sided. Thank

4   you.

5   Counsel has reminded me. We would like to go ahead

6   and move in UPXD007.

7   MR. SCHMIDTLEIN: No objection.

8   THE COURT: Okay. It will be admitted.

9   BY MR. DINTZER:

10   Q. Sir, now you should have UPX1123.

11   A. I do.

12   Q. Please take a look and let me know when you've had a

13   chance.

14   A. Okay.

15   Q. And you'll see that the first page is an email, and it

16   references you and your preference about the information. Do

17   you see that?

18   A. This email doesn't appear to be sent to me, but it mentions

19   me.

20   Q. Yes. And we're going to focus on the second page. I just

21   want to get -- apparently this information appears to have been

22   prepared for you. Do you see that, sir?

23   A. Yes.

24   Q. Okay. Now, let's look at the second page. This is a

25   slide. Do you recognize this slide?

1   A.   Yes, I think I do.

2   Q.   And what is this?

3   A.   This would be a slide prepared by somebody in my team

4   and/or marketing describing what our search strategy was at

5   that time, which was 2019.

6   Q.   Okay. And you were familiar with this back then; is that

7   right?

8   A.   Yes.

9   MR. DINTZER: We move to admit, Your Honor -- we

10   don't need the email on the first page of UPX1123. We move to

11   admit the second page, the slide.

12   THE COURT: It will be admitted.

13   MR. SCHMIDTLEIN: No objection, Your Honor.

14   A.   The key speaking note here is ███████████████████████

15   ████████████████████████, which is what we were talking about

16   earlier.

17   BY MR. DINTZER:

18   Q.   Okay. And why don't you walk us through the visual. I

19   have some questions about the notes, but why don't you just

20   walk us through the visual, just very briefly.

21   A.   Well, the top of the slide are the various Apple products

22   that use or could use search. ████████████████████████

23   ███████████████████████████████████

24   ██

25   ██

```
 1   ████████████████████████████████████████████████
 2   ████████████████████████████████████████████
 3   ██████████████████████████████████.
 4   Q.  Okay.
 5   A.  So it's a depiction of ████████████████████████████
 6   ████████████.
 7   Q.  How big of an investment was that?
 8   A.  Could you clarify in terms of what?  In terms of people?
 9   In terms of infrastructure?
10   Q.  Let's do both.  First of all, how many people were either
11   working or going to work ████████████████?
12   A.  It's a little hard to say precisely because not everybody
13   is dedicated to a single role like that at a company like
14   Apple, but in 2019, I would say -- I would estimate about ██
15   ██████.
16   Q.  And how much of a financial investment annually was Apple
17   either making or planning to make ████████████████?
18   A.  At the time, probably ████████████████████████████.
19   Q.  And then on this slide, if you look at the notes, the
20   second sentence says basically what you were saying:  █████
21   ██████████████████████████████████.
22          Do you see that?
23   A.  I do.
24   Q.  Was that at your request, as part of you being brought in
25   and working on this project?
```

1   A.   Yes.

2   Q.   The next sentence says: ██████████████████

3   And just so we know, ████ is going to be ██████ or

4   ██████

5   A.   ████████

6   Q.   So let me just capture that on this so we're all on the

7   same page. It says, "███████████████████████████████████

8   ██

9   ██████████████████████████████████."

10   Is that right?

11   A.   I see that here, yes.

12   Q.   And was that the plan, that it would be ████████████,

13   ████████████████?

14   A.   Yeah. My view was that if we were going to displace Google

15   queries in various features like Safari Suggestions, that we

16   had to be confident that these were good answers.

17   Q.   And so that -- █████████████████████████████████████

18   ████████████████?

19   A.   I'm not sure what you mean.

20   Q.   ██

21   ████████?

22   A.   I just -- I wanted to make sure that ███████████████████

23   ████████████████ was of high enough quality that when we

24   displayed answers from any search partner, that we thought that

25   they were better for the user.

```
 1    Q.   And then it goes down a few more sentences, "███
 2    ████████████████████████████████████████████████████
 3    ████████████████████████████████████████████████████
 4    ███████████████████████████████████."
 5         Do you see that?
 6    A.   I do.
 7    Q.   Then it says, "█████████████████████████████████
 8    ███████."
 9         Do you see that?
10    A.   I do.
11    Q.   What did that mean?
12    A.   Well, this was sort of a starting position.  The numbers we
13    discussed earlier are larger than these.  But the goal was if
14    we were going to provide top results for users, that we wanted
15    to make sure they matched ██████████████████████████
16    ███████████████████████████████.
17    Q.   And the top position on the search, whatever is in the top
18    position is the one that the user is going to rely on the most;
19    is that right?
20    A.   It's the one that they're most likely to click on, yes,
21    assuming the search engine did a good ranking job.
22    Q.   Okay.  No further questions on that document, sir.
23         Let's go to UPX1124.  Hopefully this will be in your
24    binder.
25              MR. DINTZER:  And I believe this one is in evidence,
```

1   Your Honor.

2   A. Okay.

3   BY MR. DINTZER:

4   Q. So this is an email August 2018, from you to Mr. -- I don't

5   want to butcher his name. What's his name?

6   A. Dupin. Benoit Dupin.

7   Q. Okay. Mr. Dupin. And do you remember this email?

8   A. I recall an email like this, yes.

9   Q. And you write, "Tim Cook has asked for a meeting to

10   understand the revenue implications of the Google deal since $

11   growth has been slowing."

12   Do you see that?

13   A. I do.

14   Q. So your understanding was that the dollars from the ISA

15   agreement with Google had been slowing down?

16   A. The growth in that revenue sharing agreement had been

17   slowing, yes.

18   Q. Okay. And I'm not going into derivatives here. The number

19   hasn't been going down. It's just its acceleration has slowed;

20   is that right?

21   A. That's what I recall the concern to be, yes.

22   Q. And then you write -- well, you write, "This is a

23   pre-meeting for that meeting."

24   So you're gathering the information so you can meet with

25   Mr. Cook, right?

1   A.   That would seem reasonable, yes.

2   Q.   Okay. And you write, "I can send you a summary of the term

3   sheet, but the numbers we need -- and Steven probably can

4   provide them -- are underlying device growth, percent of

5   devices that use Search, ███████████████████████████

6   ██

7   ██████ "

8   Do you see that?

9   A.   I do.

10   Q.   ██

11   ███ ?

12   A.   Well, I think the intention of the sentence is that if --

13   if people were interested in understanding the changes in the

14   Google revenue share, that's implicated -- the primary driver

15   of that would be the number of queries that were sent to

16   Google. And so the variables that would go into that would be

17   the number of Apple devices that were active, the number of

18   devices that were using search, in any of its forms, ████████

19   ██

20   ██ .

21   Q.   Right. So we have the user inputting a query into Safari,

22   and Apple can decide whether to send it to Google or to

23   intercept -- that's your word -- so that Apple can answer it,

24   right?

25   A.   That's correct.

1   Q.   And just out of curiosity, this decision that Apple makes

2   when a query has gone in, is there a -- I mean, it must -- it

3   has to be a very quick decision about whether to send it to

4   Google or whether to resolve it by Apple, right?

5   A.   As a practical matter, we send all of the queries to

6   ███, and then

7   ███████   decides whether or not it has a good answer.   ███████

8   ██

9   ███████.

10   Q.   Then you write, "There are two places we do this: Safari

11   Search Suggestions and Spotlight."

12   Do you see that?

13   A.   Yeah. For the purpose of the Google revenue share, these

14   are the two most important.

15   Q.   But, so, Safari Search Suggestions -- which if it's okay

16   with you, I'm just going to call Suggestions.

17   A.   That's fine.

18   Q.   Okay. We have a few too many Ss there.

19   A.   Yes.

20   Q.   So with Suggestions, Apple is intercepting the query and

21   responding itself, as opposed to sending it to Google?

22   A.   We're offering a suggestion that the user might choose

23   which would mean that they didn't go to Google, like your

24   sneakers example earlier.

25   Q.   Okay.

1   THE COURT: To be clear, when you're talking about

2   the Suggestions, so for example, Demonstrative 7 here --

3   THE WITNESS: Yes.

4   THE COURT: -- is it always the case that there are

5   also Google Search suggestions displayed at the same time as

6   the Apple suggestions?

7   THE WITNESS: No. This is just one example. The

8   feature's fairly complicated. So what would be shown for any

9   given beginning of a query depends on the nature of the query.

10   So, if you typed in AA123, we might show a flight, if you had

11   one in your calendar, for example. So the feature's fairly

12   multifaceted, and looking at any one example doesn't really

13   give you the sense of it.

14   But we will either offer straight-up answers or

15   suggestions like this navigation query or suggestions you that

16   might want to get something from your device. So the Spotlight

17   and Safari have different design centers. Spotlight is

18   designed to start on your device but let you search the web.

19   And I would say that Safari is really designed to let you

20   search the web, but it will show you things that are highly

21   relevant to you.

22   THE COURT: And this demonstrative, this is a search

23   on Safari or on Spotlight?

24   THE WITNESS: This is a suggestion on Safari. And by

25   far, the most common thing we suggest and users click on is

1   what we call a navigational query, which is going to a website

2   directly when you type in a few characters of the name, rather

3   than going to Google and clicking Position One or the ad that

4   is there.

5   BY MR. DINTZER:

6   Q.   And this saves people time. They save a trip to Google?

7   A.   Yeah. We think it's a much better user experience, yeah.

8   Q.   Okay. So let's go to UPX -- no further questions on that

9   document, sir. Let's go to UPX494.

10   Oh, just to round out, to finish the Court's question,

11   you also use ███████ to answer questions on Spotlight; is that

12   right?

13   A.   Yes, we do.

14   Q.   Now, let's go to UPX494.

15   A.   Sorry. What's the number here?

16   Q.   494.

17   A.   I have it.

18   Q.   This is another email by you; is that correct? The top

19   email.

20   A.   Yes.

21   Q.   Let me clarify. It's a series of emails, but the top one

22   is from you; is that correct?

23   A.   Yes.

24   Q.   And if we go to the bottom of the chain, could you give me

25   a hand on that, the pronunciation of that gentleman's name?

1   A.   Let's just call him Cheenu.

2   Q.   Fair enough, sir. And I will spell his name for the court

3   reporter. It's S-R-I-N-I-V-A-S-A-N, and last name

4   V-E-N-K-A-T-A-C-H-A-R-Y.

5   And Mr. Cheenu, what does he do at Apple?

6   A.   He is not currently at Apple. At the time of this email,

7   he was in charge of ████████

8   Q.   He writes at the bottom, "Hi, JG. The fallback web search

9   from Siri is using ████████ Google, which they still

10   support."

11   Do you see that?

12   A.   I do.

13   Q.   Siri is Apple's voice assistant. We haven't gotten to Siri

14   yet. Siri is Apple's voice assistant; is that right?

15   A.   That's correct.

16   Q.   And in just one sentence, can you just tell us what Siri

17   is?

18   A.   Siri is Apple's voice assistant. It's the feature on your

19   iPhone where if you, you know, say "Siri" or you press the

20   button on the side of the phone and ask a question or do an

21   action like send a text message, that we try to do that for

22   you.

23   Q.   And most of the things that Siri does -- and I use Siri

24   myself quite a bit -- most of the things Siri does are not

25   answering -- responding to queries with information from the

1 internet or --

2 A. That's correct. Mostly, voice assistants are focused on

3 actions.

4 Q. Like play some music or send a text?

5 A. Or turn on the living room lights or something like that,

6 yeah.

7 Q. And so --

8   THE COURT: What was the last thing you said?

9   THE WITNESS: Turn on the living room lights. Do

10 some kind of home automation thing.

11 BY MR. DINTZER:

12 Q. And so when this email says "The fallback web search from

13 Siri uses ███████ Google," what does that mean, just

14 basically?

15 A. The Siri voice assistant has a feature which is: Search

16 the web for this.

17   So you might say show me pictures of puppies or

18 search the web for, you know, USBs. And so for that feature

19 inside of Siri, it can fall back to web search.

20 Q. And you don't consider Siri a general search engine?

21 A. No.

22 Q. It doesn't produce a search engine result page?

23 A. No, it does not.

24 Q. And the fallback for Siri at this point was powered by

25 Google, correct?

1   A. I believe that's correct, yes.

2   Q. And then he writes on the second page here, "Benoit and

3   I" -- I'm sure I am butchering that. I apologize -- "were

4   chatting that going forward, we could just power this with

5   ███████ web search results with an explicit way to search

6   Google, if the user wants."

7   Do you see that?

8   A. Benoit, yes.

9   Q. Benoit. I'm sorry.

10   A. I see that.

11   Q. And so Apple's ███████ could power the fallback from Siri.

12   That's what he's proposing?

13   A. That's correct.

14   Q. And he writes, "This would be a better privacy angle and

15   help us collect better signal."

16   Do you see that?

17   A. I do.

18   Q. Why would it be a better privacy angle ████████████████

19   ████████████████████?

20   A. ███

21   ██.

22   Q. And you believe Apple has the best security, as opposed to

23   sharing the information?

24   A. In this case, particularly for Siri, because typically Siri

25   questions are asked with your voice, and so we generally

1   consider them to be more sensitive.

2   Q. Then he writes, the second part of this, "Collect better

3   signal."

4   Now, we've talked a little bit. "Signal" means the data

5   from the question and response, right?

6   A. Yes.

7   Q. Getting better signal helped in ███████████████████████,

8   right?

9   A. It would. But I think the -- I think in Siri, the gains

10   would be pretty marginal. But I don't disagree with what he

11   wrote. I just don't think it was that big a deal.

12   Q. And then Mr. Cheenu wrote you a second time, a little

13   later, is that right? A second email. Do you see that on 494?

14   A. Yes.

15   Q. And he writes, "Though don't know if the Google contract

16   requires us ███████████████. Can ask Vivek."

17   Do you see that?

18   A. Yes.

19   Q. Who is Vivek?

20   A. Vivek was in product marketing, and so he would be the

21   engineering team's interface to any contractual limitation or

22   requirement that we had for any partner.

23   Q. And then you respond on July 10th; is that right?

24   A. Appears so.

25   Q. And you write, "I agree this would be better if we power it

1   ourselves."

2   A.   I see that.

3   Q.   So you agree that the better option would be to have

4   ████████   respond to Siri's fallback?

5   A.   Yes, I agreed with him.

6   Q.   And you write, "We should get a copy of the contract and

7   see what constraints we have."

8   Do you see that?

9   A.   I do.

10   Q.   And the contract you're talking about is the ISA?

11   A.   Yes, I believe so.

12   Q.   And the constraints would be what limits the ISA would

13   place on Apple's ability to, in this instance, ████████████

14   ████████████   ?

15   A.   Yeah, this is what I was asking here, is do we have any

16   constraints?

17   Q.   And you understood that the Google contract could put

18   constraints on Apple to do stuff, such as answer questions for

19   Siri.

20   A.   I wasn't aware of what those could be, so I was telling

21   Cheenu to go talk to Vivek and make sure that -- because I was

22   agreeing with him that we should make this change, and I was

23   telling him to go dot the I's and cross the T's.

24   Q.   That was the first step before you started any of the

25   engineering, to find out what the contract said?

1   A.   Well, reading this thread now, I think I was in strong

2   agreement with Cheenu that we should take it on ourselves.

3   Q.   Then you wrote, "█████████████████████████████████████

4   ███."

5   Do you see that?

6   A.   Yes.

7   Q.   ████████████████?

8   A.   ███

9   ███

10   ██

11   ███

12   ██

13   █████████████████████████

14   ███

15   ███

16   ██

17   ███

18   ███

19   ████████████████████████.

20   Q.   █████████████████████████████████

21   A.   Not that I'm aware of.

22   Q.   So now let's -- no further questions on that document, sir.

23   Let's go to --

24   A.   Well, I would like to make a comment, which is: We

25   actually implemented what was proposed here.

1   Q. So ███████ became the fallback?

2   A. For Siri Search.

3   Q. Okay. And did you conclude that the Apple agreement did

4   not prevent ████████████████████████████████████?

5   A. I wasn't involved in the discussion, but I assumed it

6   turned out to be a nonissue, yes.

7   Q. As you said, most of -- okay. Well, thank you, sir.

8   Let's go to UPX659. Let me know when you're there, sir.

9   A. Okay.

10   Q. And, again, we have an email chain that you're on. Do you

11   see this?

12   A. I do.

13   Q. Okay. And if you -- you'll see the one in the middle of

14   the first page, there is a series of questions and then

15   answers. Do you see that?

16   A. Yes, I do.

17   Q. You write, "Here are my answers," and then you go on.

18   And my understanding is, sir, that people -- it has

19   different names next to each of the questions -- people sent in

20   questions and then you provided the answers. And the subject

21   here is, "Follow-Up questions to the SPG and AIML, all hands."

22   Do you see that.

23   A. Yes. I think context here is we probably had a meeting of

24   my entire team, which is many thousands of people, and that we

25   answer -- in these meetings we typically answer questions live,

1   and we don't get to all the questions. And as people put

2   questions on a Slack channel, then we have a habit of following

3   up later and making sure we answer everybody's question.

4   Q. So the questions that we're seeing on 659, they were put

5   into a Slack channel, and then you followed-up and answered

6   them?

7   A. Yeah. Here, it says, like, From, and then it has a

8   person's name. So that's the person who put the question in

9   the channel.

10   Q. Okay. So if we go to the second page, and we see under

11   Number 3 on the second page -- let me just know when you're

12   there, sir.

13   A. Yes.

14   Q. Okay. And it says, "███████████████████████████████

15   ████████████████████████████████, are we trying to seriously

16   complete with Google?"

17   And apparently this came from someone named Shawn Li.

18   Do you see that?

19   A. I do.

20   Q. Do you know who Shawn Li is?

21   A. I don't. I assume it's an employee in my organization.

22   Q. Okay. And then you provided the answer that follows; is

23   that right?

24   A. The second paragraph, yes.

25   Q. So you write, "We front all information queries, including

1   those that eventually go to a search partner."

2   Do you see that?

3   A. I do.

4   Q. And you used the term "front." Could you explain what that

5   term means?

6   A. Well, what we've already been discussing, which is

7   intercept or divert, or we see every query first and foremost

8   in Safari and Spotlight, and then we make a decision and

9   determination about whether to send it to the default search

10   engine.

11   Q. Okay. And hypothetically, if Apple wanted to, it could

12   send the query to a different source. It could send it to a

13   different search engine. It could choose between search

14   engines?

15   A. We could, yes.

16   Q. And by fronting information queries, Apple can choose where

17   they go?

18   A. Yes.

19   Q. Then you write, "███████████████████████████████████████

20   ██

21   ████████████████████████████████."

22   Do you see that?

23   A. I do.

24   Q. ██

25   ██?

1 A. ██████████████████████████████████████

2 ██

3 ████████████████████████████████████

4 ██

5 ██

6 ████████████████████████████████████.

7 Q. Just not offering a SERP?

8 A. Well, there would be several more things you would need to

9 do. You would need to invent a SERP experience, and you would

10 also need to invest considerably more and make the index larger

11 and so on and so forth. But all of the pieces, most of the

12 critical technology, including ranking and machine learning, we

13 were working on. So I was trying to assuage the employee's

14 scepticism that we were serious about this.

15 Q. Because you were serious about Search?

16 A. We are.

17 Q. Okay.

18 A. We are, yeah.

19 Q. So the next line says, "World knowledge" -- and you put

20 quotes around that -- "is critically important to us as a

21 company, which is why we are investing ████████████████

22 ██

23 ████████████████."

24   Do you see that?

25 A. I do.

1   Q. And when you say "world knowledge," what does that mean?

2   A. Well, I think I put this in quotes because it's my term.

3   It's not a general term in the industry, but I use it to

4   describe a company like Apple having systems that understand

5   broadly what's going on in the world. So, games that are being

6   played, events that are happening, you know. And that includes

7   the Knowledge Graph. It includes Search. But it also includes

8   other things, like realtime index of Twitter, sports scores,

9   the weather. That's what I call world knowledge.

10   Q. No further questions on that document, sir.

11   Now, am I right, Apple gets ▮▮▮▮ queries per week

12   between Siri and Spotlight?

13   A. In which timeframe?

14   Q. Per week. I'm sorry.

15   So, in a week -- so, between Siri and Spotlight, in a

16   week they get about ▮▮▮▮ queries?

17   A. It's probably higher than that now. It's probably more

18   than ▮

19   Q. I'm sorry?

20   A. Probably more than ▮

21   Q. ▮ plus. And how many queries a week does Safari get?

22   A. It's probably about ▮ percent of that number. I'm

23   speculating here, but it's the majority, so let's call it

24   ▮ percent.

25   Q. So, in a week, Apple completely gets about ▮▮▮▮

```
 1    queries?

 2    A.   No.  I was saying it's ▆ percent of the ▆▆▆▆▆▆.

 3    Q.   I'm sorry.  So this is Siri, Spotlight, and Safari?

 4    A.   Yes.

 5    Q.   So I just want to make sure.

 6    A.   I think that would be about ▆▆▆▆▆▆ a week, something

 7    like that.

 8    Q.   Okay.  And ▆ percent of that is Safari?

 9    A.   I'm estimating, but, yes.

10    Q.   Okay.  And then do you know how many queries Google gets in

11    a week?

12    A.   In a contemporary time period, I'm not aware of that

13    number, but it will be considerably higher.

14    Q.   You agree that Apple has the resources, financial and

15    technological, to develop or acquire a general search engine?

16    A.   I would agree with that, yes.

17    Q.   And that that's something Apple could do, if it wanted to?

18    A.   It would be a major undertaking with lots of implications,

19    but, yes, we could.

20    Q.   And Apple's chosen not to do that to this point?

21    A.   That's correct.

22    Q.   Now, general search engines can get -- and we're going to

23    talk now about the types of queries -- they get a lot of

24    different kinds of queries; is that right?

25    A.   I mean, we get the same queries in Safari, so --
```

1   Q. Right. And basically, the idea of a general search engine

2   is people can type in any type of query. They don't have to --

3   there's not a narrow vertical, they can put anything in there?

4   A. That's correct.

5   Q. Okay. And I don't know if you'd want this -- I think of it

6   as a curve, you can tell me if I'm wrong. One part of the

7   queries are head queries; is that right?

8   A. Yes.

9   Q. And I've seen a lot of different definitions between

10   head -- and then a middle set of queries called torso; is that

11   right?

12   A. That's the taxonomy that's used in the search industry,

13   yes.

14   Q. And then we have the tail; is that correct?

15   A. Yes.

16   Q. And I've seen some people say that you divide up all

17   queries and you have got a third, a third, a third. Is that

18   how you think of it, or do you think of it differently?

19   A. By impact you might call it a third, a third, a third. By

20   "impact," I mean number of users who do those queries by size

21   of the investment or the size of the relative parts of the

22   curve. The torso and tail are much, much larger than that.

23   And, I mean, this is a valid taxonomy for queries, but queries

24   themselves are not all of the same kind. So we were talking

25   before about navigational queries, which is like finding a

1   website.

2   Q. Yes.

3   A. And so there, the torso is more important, actually, than

4   the head because there's hundreds of thousands of websites. So

5   if -- depending on the feature you're trying to implement, you

6   might care more about the torso, whereas if you're looking up

7   sports scores, maybe you only care about the head. You want to

8   make sure you can get the score for every NBA game, and then

9   you're done. So the head is very well defined.

10   Q. If you have an exotic research product or maybe you can't

11   spell, then maybe the tail would be more important.

12   A. Yeah, the tail would be things like, you know, your kid's

13   school calendar.

14   THE COURT: I'm sorry. Just to go back to a question

15   that was asked earlier.

16   You identified Apple, Siri, Spotlight, Safari as

17   implementing -- or intercepting, in your term, ████████

18   queries a week. You said Google's number is considerably

19   higher. Do you have a rough magnitude of how much higher?

20   THE WITNESS: Well, I'm aware of the number when I

21   was at Google. But, I mean, I think a rule of thumb would be

22   an order of magnitude higher.

23   THE COURT: I'm sorry?

24   THE WITNESS: An order of magnitude. So at least ten

25   times higher.

1   THE COURT: At least ten times higher. Okay. Thank

2   you.

3   BY MR. DINTZER:

4   Q. And just the way the Court phrased it, and maybe I'm wrong,

5   but is this ███████ that Apple gets, that's not that they

6   intercept, is it?

7   A. It's a number we can intercept.

8   Q. Number you can intercept.

9   Do you have any idea how many Apple intercepts that

10   would otherwise go to Google?

11   A. I think it's between ██████ percent. Now, remember, the

12   intercepting them just means providing a suggestion.

13   Q. So intercepting does not necessarily mean Google doesn't

14   get them?

15   A. No. The user ultimately decides which suggestion to click

16   on.

17   Q. Okay. So of the ███████ queries that Apple gets, it

18   shows a suggestion for █████ percent of those?

19   A. Yeah. We call those metrics shown coverage.

20   THE COURT: Does it show a suggestion for only ████

21   █ percent or does the user only click on the suggestion ████

22   █ percent of the time?

23   THE WITNESS: So, there's two metrics. There's how

24   often does Apple show a suggestion above the Google

25   suggestions, and then there's how often the users click on the

1   Apple suggestion. So both of those metrics are something we

2   track closely, and the number of ███ percent is how often

3   we show a suggestion. I would estimate the click-through rate

4   on any suggestion, including Google, at, you know, less than

5   █ percent.

6   BY MR. DINTZER:

7   Q. Do you have the number -- and, again, roughly -- of what

8   the click-through rate is on Apple Suggestions alone?

9   A. I don't have that number today.

10   Q. So we were dealing with the head, torso, and tail.

11   And the concept of freshness, just two sentences on what

12   freshness means for the index and the ability to respond.

13   A. Well, we were talking before about crawling the web and

14   then indexing the web. And so for some websites you might want

15   to crawl and index it very quickly, within a few seconds, so

16   you know what's breaking news on *The Washington Post* website.

17   And for other sites, you might only crawl them every month or

18   every few months, it's a really obscure website.

19   Q. And for a popular head query you might require more

20   freshness, which means that the answer is more up-to-date,

21   correct?

22   A. Yes. It would be an expectation for the user that we --

23   you'd be very fresh for head queries.

24   Q. So we talk about the tail, and those are the queries that

25   lead to documents which were retrieved very infrequently; is

1   that correct?

2   A. Yes.

3   Q. And users expect at least some answer, even for their

4   obscure queries, right?

5   A. For a good search engine, they would become suspicious if

6   they knew something existed and they couldn't find it, and so

7   the tail requirement is pretty onerous.

8   Q. So if I ran a marathon ten years ago and I wanted to

9   remember my time and I knew somewhere it was posted, I would

10   expect it to be pulled up by a search engine. That would be

11   kind of how I would judge the search engine?

12   A. You would expect a good search engine to be able to find

13   your marathon time, yeah.

14   Q. And that's, in part, a function of the index, whether the

15   search engine has captured that, right?

16   A. Yes.

17   Q. And if you don't have as many queries, you will do worse in

18   the tail; is that true?

19   A. Queries will help. By definition, the tail has very few

20   queries. These are things that people search for very rarely.

21   Q. And how do queries help a search engine do better in the

22   tail, especially the long tail?

23   A. Well, it's diminishing returns. Usually what people do in

24   modern search engines is they try to learn from the head and

25   the torso and predict what they need to do in the tail because

1   there's just not enough queries in the tail, especially in

2   low-resource languages.

3   Q. But for a search engine with more data, even if they have

4   only seen this thing in the tail once or twice, they would have

5   an advantage over a search engine that has never seen the query

6   before?

7   A. There would be a marginal advantage, yes. The most

8   important thing for the tail is to have a much bigger index,

9   which is a function of resources.

10   Q. And I want to get a confirmation. If you don't have as

11   many queries, you will do worse in the tail; is that right,

12   sir?

13   A. Queries will help you prioritize the tail, but if you don't

14   have the document, the query is not going to help you.

15   Q. So now we're going to get to a term. I think you used it

16   earlier, and now we're going to look a little bit more, sir.

17   The concept of search ranking. Maybe just two sentences on

18   search ranking.

19   A. Well, broadly speaking, a modern search engine takes your

20   query, very quickly retrieves a large number of potential pages

21   you might be interested in. And then the problem is how do you

22   rank them, how do you put them in order, so when you display

23   them on the search engine result page, they're displayed in the

24   best possible order. And that's a very hard computer science

25   project.

1   Q. And does search ranking also include ranking of nonweb

2   results?

3   A. In modern search engines, yes.

4   Q. That means figuring out whether the best first slot should

5   go to structured answer or something else, along with figuring

6   out the web results?

7   A. Yeah. For the example you gave earlier, of how old is

8   Steph Curry, right, you need to know you should be showing the

9   answer, and that's a ranking problem.

10   Q. And so the ranking problem is -- so the -- here are the

11   different slots (indicating). The ranking problem is what --

12   not only the set of things that go into the slots, but what

13   order to put them in?

14   A. That's correct.

15   Q. And the order is really important. So, even if you have

16   all of these in your index, if you get them in the wrong order,

17   that affects the quality of your search results?

18   A. Yes. It's very important.

19   Q. And the top thing could be a map, could be the age of Steph

20   Curry. It could be a lot of different things, along with web

21   results that you click on, you go to a website?

22   A. Yeah, that's correct.

23   Q. And I think you said this in depo, and I'll ask you:

24   Presenting documents in the best order is the hardest problem?

25   A. In my opinion, yes.

1   Q.   And that search ranking is one of the most important

2   features of a general search engine?

3   A.   Yes.

4   Q.   Okay. Engagement. Engagement means users clicking on the

5   results they prefer?

6   A.   Engagement is generally taken to mean how a user engages

7   with any search result in any format. Like, for example, a

8   suggestion or a search engine result page.

9   Q.   So the search engine has listed different things here, and

10   my picking of something, that's my engagement?

11   A.   That's one part of an engagement signal, yes.

12   Q.   Okay. Me hovering over it and thinking about it, that

13   would be another type of engagement?

14   A.   That's correct.

15   Q.   And me clicking on it, seeing, oh, this is a crummy page,

16   coming back to the search engine and clicking on something

17   else, that would be another type of engagement?

18   A.   That's correct.

19   Q.   And search engagement is one way that you can improve a

20   search relevance, right?

21   A.   That's correct.

22   Q.   Engaging is one of the ways you can get more rankings of

23   these items right, better?

24   A.   You can use the engagement signal to refine the ranking

25   algorithms, yes.

1   Q.   And so if -- let's say we have one, two, three, four, five,

2   you've laid these out, but it turns out that people like No. 3

3   better than No. 1 or 2, so they go on this, they um, um, ah,

4   and they click on this one and they stay there a while.

5   That -- what does that teach the search engine?

6   A.   Well, it's a very complicated process because not everybody

7   will click on No. 3. But generally, it can teach the search

8   engine that 3 is preferred to No. 2.

9   Q.   To the question that I asked?

10   A.   For the query that you asked.

11   Q.   And we're going to refine this just a little bit. So if I

12   said best coffee USA, then I get this, I -- the search engine

13   learns, well, a three might be a better response for best

14   coffee USA, right?

15   A.   I agree with that, but I would qualify it. I'll give you

16   one example. The search engine might take into account the

17   time of day for that query and give you a completely different

18   ordered list.

19   Q.   Fair enough. So even though I don't put in at 12 a.m., the

20   search engine might know that and it would look into its -- I'm

21   not going to get too deep into the search stack, but it would

22   research that and say, at 12 a.m., this is the best order, but

23   if -- at 12 p.m., it may be a different order?

24   A.   That's correct.

25   Q.   And the same way. If I said best coffee near me, and it

1   knows where I am, it will almost certainly give a different set

2   of one through five if I live in LA, which is where I'm from,

3   as opposed to D.C., which is where we are now, right?

4   A.   For that example, of course. Yes.

5   Q.   And so the location is also important. And so if I'm in LA

6   and I say best coffee near me, it will look into the search

7   stack, and one of the things it will take into account is

8   what -- what is the best answer for somebody in LA asking this

9   question?

10   A.   That's correct. And this is why I say the ranking is hard.

11   Q.   It's -- trying to even understand it at my level is hard.

12   So the more queries a search engine sees, the more

13   opportunities it has to improve in this manner?

14   A.   The more opportunities the engineers have to look for

15   patterns and improve the algorithm, yeah.

16   Q.   And you can't build a general search engine if you have not

17   seen a representative number of queries?

18   A.   I would agree with that.

19   Q.   And the most important search signal is an engagement?

20   A.   It's one of the most important.

21   Q.   Let's go to UPX240. And just let me know when you're

22   there, sir.

23   A.   I'm there.

24   Q.   Who is Mr. Perica?

25   A.   Mr. Perica is the head of business development, mergers and

1   acquisitions at Apple.

2   Q. Is he still there?

3   A. Yes, he is.

4   Q. Okay. And this is an email -- a 2018 email between you and

5   Mr. Perica, an email chain; is that right?

6   A. It looks like it, yes.

7   MR. DINTZER: And, Your Honor, we offer UPX240 for

8   admission.

9   MR. SCHMIDTLEIN: No objection.

10   THE COURT: It will be admitted.

11   BY MR. DINTZER:

12   Q. And, so, we go to the second page, on December 12th, 2018,

13   where you start, "All good questions."

14   Just let me know when you're there, sir.

15   A. I'm there.

16   Q. And you write, "Siri doesn't compete directly against

17   Google Search. It competes against Alexa and Google Assistant.

18   The query mix is very different."

19   Do you see that?

20   A. I do.

21   Q. And do you still believe that today?

22   A. Yes. That's what we were talking about before, about voice

23   assistant being different from search.

24   Q. Okay. And then you write, next paragraph down: I don't

25   think Bing can do better than Google Search for the search use

1   case unless it spends more on it or has a better mousetrap.

2   Not having mobile queries at scale is a huge liability for them

3   since the most important search signal is engagement."

4   Did you write that?

5   A. Yes. Because in the email below, Adrian is making the

6   case, I think, of why do we think we can make Siri better than

7   Alexa but not compete with Google, or whatever the language is

8   below there. So I'm bringing in my opinion about what it would

9   take to beat Google in search.

10   Q. Right. So we're going to kind of break this down about

11   this. And we've talked about what engagement is. And you say,

12   "The most important search signal is engagement."

13   And I assume you believed that in 2018; is that right,

14   sir?

15   A. Yes, it's one of the important signals.

16   Q. Okay. Well, actually, you don't qualify it in the email,

17   do you?

18   A. This is one email out of many, right.

19   Q. Understood, sir. Understood.

20   And do you still feel that it's one of the most

21   important search signals, the engagement?

22   A. I do think it's one of the most important signals. But, I

23   did go on to say that it's not impossible to imagine

24   competing --

25   Q. I promise we'll get to that section. Okay?

1   A.   Okay.

2   Q.   I promise I'm not going to leave it out.

3   And you write, "Not having mobile queries at scale is a

4   huge liability."

5   I want to just focus on that for a second. Mobile

6   queries are, obviously, queries that come from your phone,

7   right?

8   A.   From mobile devices generally, yes.

9   Q.   Okay. And not all data is created equal, right?

10   A.   That's evidently true, yes.

11   Q.   And so mobile queries give you this kind of information

12   that we were talking about, ranking information and engagement

13   signals. Mobile queries give you that type of signal on a

14   mobile device, right?

15   A.   Depending on how you access the search. You could use a

16   web browser or you could be using a search application. I

17   mean, there are many ways to get to search on a mobile device.

18   But, broadly speaking, yes.

19   Q.   A query mix from a mobile device is different than a query

20   mix from a desktop device.

21   A.   Generally, I would agree with that, yes.

22   Q.   And so having -- and I think this is the point you're

23   making in your email. Having mobile queries at scale is

24   important in answering mobile queries.

25   A.   Yes, I agree with that.

1   Q. So, I promised you we would get to the next sentence, so

2   we're going to do it. And you write, "But it is not

3   impossible. As we noted yesterday, the reason a better search

4   engine has not appeared is that it is not a VC-fundable

5   proposition, even though it's a lucrative business."

6   You wrote that?

7   A. That was my judgment in an email to Mr. Perica.

8   Q. Okay. So we're going to break that down. First of all,

9   general search is a lucrative business. We can agree on that?

10   A. Yes.

11   Q. Okay. And when you say "VC," I think I know what you mean,

12   but if you could explain what the term "VC fundable" means.

13   A. I mean venture capital fundable. So, like, a startup could

14   not raise enough money, in my opinion, to build a very good,

15   large-scale search engine.

16   Q. You believed that in 2018?

17   A. I did.

18   Q. And you still believe that?

19   A. I do.

20   Q. You write, "Can I imagine that Apple could build a search

21   engine to compete? Yes. But it's probably not the best way to

22   differentiate our products."

23   Do you see that?

24   A. I do.

25   Q. And you still believe that Apple could build a search

1   engine to compete with Google?

2   A.   As a matter of fact, yes.   Of course.

3   Q.   All right.   And when you say "not the best way to

4   differentiate our products," what do you mean by that, sir?

5   A.   Well, there already are many general search engines in the

6   world that users choose to use.   I was very focused, I think,

7   on spending our time and resources on the kind of features that

8   we've just been discussing, which is providing answers more

9   quickly, more contextually, more personal and private ways.

10   Q.   For the most part, Apple tries -- with stuff like Apple

11   Maps, Apple tries to develop the technology in-house and

12   provide the responses to the users of their devices themselves;

13   is that right?

14   A.   ██

15   ██████ .

16   Q.   But the vast majority of queries that Apple gets right now

17   go to Google, right?

18   A.   The user sends them to Google, yes.

19   Q.   The default on Safari, if the user does nothing else but

20   type in a query into Safari, they'll get sent to Google;

21   correct?

22   A.   As we've been discussing, they oftentimes will get

23   suggestions from Apple, they'll get suggestions from Google,

24   and then they pick.   If they pick the Google suggestion, they

25   will go to Google.

1   Q.   Right. But if he don't pick anything and they keep typing

2   "sneakers" and they hit enter, they'll go to Google.

3   A.   Yes. That's a minority case. But, yes.

4   Q.   So the default suggestion, other than Apple's, are

5   Google's?

6   A.   Yes.

7   Q.   And the default response, if they don't pick a suggestion

8   and hit the button, that's Google's?

9   A.   Yes. But most people are trained to pick a suggestion.

10   Q.   Pick a Google suggestion.

11   A.   To pick a suggestion. They type character by character,

12   and then once they see what it was they were thinking of, they

13   click that.

14   Q.   Okay. And those go to Google?

15   A.   If Google's set as your default search provider in Safari,

16   yes.

17   Q.   Which it is out of the box?

18   A.   Correct.

19   Q.   Okay. Let's go to Mr. Perica's response to you on UPX240.

20   And, of course, you're welcome to read any part of this, but

21   what I'm going to direct you to is in the middle of that sort

22   of long paragraph, the second paragraph that he's writing. And

23   he writes -- and you can see on the screen where I'm headed.

24   He writes, "For instance, in a perfect world, what are

25   the pros and cons of just moving a large majority of our search

1   knowledge OpEx spend to Microsoft to let them surface

2   Australian rugby scores or Indian cricket scores for us? Siri

3   would retain traffic cop functionality that chooses whether it

4   is a search we should return in our UI and without ads."

5   Do you see that?

6   And I'm going to go to the next thing, I promise.

7   A.   I see that.

8   Q.   And so he posits a world where Apple distributes queries

9   between Microsoft or Google, depending on the nature of the

10   query?

11   A.   Well, I think he's -- again, he's talking here about Siri,

12   not general search.

13   Q.   ██

14   ███████████████████████?

15   A.   ██

16   ███

17   ████████████████████████████████████.

18   Q.   Right. And his thinking, though, was that Google -- I

19   mean, Apple could act -- I think he used the term "traffic

20   cop" -- but as Apple gets a query, and then Apple chooses

21   whether to send it to Google or to Microsoft. I mean, that's

22   the thought experiment?

23   A.   Well, I think Mr. Perica's suggestion here wouldn't work.

24   He says, "I'm getting more attracted to the idea of

25   collaborating on a knowledge base."

1   So we talked before about the Knowledge Graph. And

2   so one of the things we had discussed with Microsoft, and maybe

3   we'll get to that, is potentially sharing a Knowledge Graph.

4   And his suggestion of deciding that the query was for the

5   Knowledge Graph and then just sending it to Microsoft isn't

6   actually technically feasible. But, you know, he's a business

7   person who was asking a good question: Why can't we do that?

8   Q. So I just want to understand. It's not technically

9   feasible for Apple to serve as a traffic cop and send queries

10   to Google or Microsoft?

11   A. Well, for this specific suggestion here about Australian

12   rugby scores or whatever, you would need to know that the query

13   was requesting that before you decided to direct it to

14   Microsoft. The only way to know that is do the full ranking,

15   ██

16   ██

17   ████████████████ .

18   Q. So it would need to be a knowledge graph or some sort of

19   search function in Apple before it played traffic cop of

20   sending the queries to Google or Microsoft?

21   A. Yeah. And that's what we had had preliminary conversations

22   at a very high level with Microsoft about potentially doing.

23   Q. And then he writes, "Thus, send it to Microsoft to deliver

24   the answer. Alternatively, it's a search where we users have

25   commercial intent or appears very long tail, they'll send it to

1   Google."

2   So that's basically spinning out the rest of this idea

3   of Apple as traffic cop?

4   A. Yeah. This wasn't a very feasible idea, in my view.

5   Q. And then he writes -- skipping a sentence. He writes, "We

6   build them up, create incremental negotiating leverage to keep

7   the take rate from Google and further our optionality to

8   replace Google down the line."

9   Do you see that?

10   A. I do.

11   Q. Okay. So he's -- and I understand this is more on the

12   business side, but he says that by building up Microsoft, it

13   would create negotiating leverage with Google; is that right?

14   A. That's what he's suggesting, I guess.

15   Q. And would give Apple optionality down the line.

16   Okay. No further questions on that, sir. We can go to

17   UPX266.

18   Sir, there is a lengthy email that you sent to --

19   MR. DINTZER: This is already in evidence, Your

20   Honor.

21   BY MR. DINTZER:

22   Q. -- to Mr. Perica as well as to a few others at Apple; is

23   that right?

24   A. That's correct.

25   Q. And you write, "Since Kevin and I were talking in code at

1   last week's meeting, here is a primer on the key parts of a

2   modern search engine."

3   Do you see that?

4   A.   Search product, yes.

5   Q.   Search product. I'm sorry. Modern search product.

6   You wrote that, sir, right?

7   A.   I did.

8   Q.   And Kevin is Kevin Scott from -- the CTO from Microsoft; is

9   that right?

10   A.   Yeah, I believe so.

11   Q.   Okay. And we're going to get to that more in a little bit.

12   Right now, I just want to focus on what you do here in the

13   document. This document was to basically explain -- I mean,

14   you call -- it's a primer on the key parts of a search engine.

15   That was your intent?

16   A.   Yes.

17   Q.   Okay. And we've already talked about some of this, and I'm

18   certainly not going to go through all of it. And then -- but I

19   do want to ask about a few pieces of it.

20   But before we get to that, the next sentence is, "It may

21   help explain why there are so few serious contenders in this

22   space because of the depth of R&D needed."

23   Do you see that?

24   A.   I do.

25   Q.   And when you say "in this space," you mean general search

1   engines?

2   A.   Yes.

3   Q.   And the "so few contenders" -- "serious contenders" is

4   because of the cost and complexity of the general search engine

5   problem?

6   A.   In my opinion, to build a competitive project is very

7   expensive.

8   Q.   And so the first section is Crawl and Index, and we've,

9   fortunately, already covered that, right?

10   A.   Yes.

11   Q.   And then the second section is Query Reformation Search

12   Ranking. Do you see that?

13   A.   Query reformulation, yes.

14   Q.   Reformulation and search ranking. And we've covered a lot

15   of that, but there's a few things I want to touch on.

16   A.   Yes.

17   Q.   You write -- and, of course, I mean, obviously, we can

18   refer to any of this, but we're trying to move it along. You

19   write about halfway down the page -- well, actually, I take it

20   back. A little bit above that you write, "Then you need to

21   score this interpretation query and then rank the retrieved

22   documents."

23   Right?

24   A.   Yes.

25   Q.   And just what do you mean by that, "to score this

1 interpretation query"?

2   We've talked about ranking the documents. I think we

3 understand that. But what do you mean on the "score" part?

4 A. Well, the first few sentences here are talking about

5 something called reformulation. So, rarely do you type in the

6 query that you intended or the query that would find you the

7 best answer, and so an important part of ranking is to take

8 your query and then to expand it out to other things you might

9 have meant. So, you might have said "the Mets." What you

10 actually meant was the New York Mets, right, or other synonyms

11 for that.

12   So, typically, you take the query and you expand it

13 into lots of potential queries before you do the retrieval

14 step.

15 Q. So, if I type in "New York baseball" and I live in Queens,

16 then it might substitute the Mets as part of the query before

17 it sends it out to be ranked and to be resolved?

18 A. That's correct.

19 Q. And data is used in this process, right? User engagement

20 is used in the process of figuring out what the alternatives

21 are?

22 A. Yeah, there are many, many signals used in that part of the

23 process.

24 Q. Right. And one of them is user engagement?

25 A. Yes.

1   Q. Is clicks and hovers and click-backs and all that type of

2   user engagement used in the process of what substitutes for

3   what?

4   A. That's one of the signals, but there are many, many

5   signals.

6   Q. Right. But it's an important one.

7   A. It's important. I think there are other signals which are

8   equally important, such as what's called anchors, which is the

9   bits of the web that point to other bits of the web, and that's

10   one of the reasons why you need a very large index.

11   Q. The next thing you write -- well, it's really not the next

12   thing. A few sentences down you write, "The most powerful

13   signals here are click-through on previously presented docs."

14   Do you see that?

15   A. I do.

16   Q. Here, we talked about that's the clicking through on No. 3

17   and showing that that's important to somebody who typed in best

18   coffee in the USA?

19   A. I mean, this was a high-level primer for a business person.

20   I know here I say "the most powerful signals," plural, because

21   it's not just clicks, as you're describing them, it's

22   engagement signals, it's scroll signals. There's many, many

23   signals here.

24   Q. There are. There are many, many signals. And you're

25   getting a little deeper. But if I scroll down, that's a

1   signal?

2   A.   Correct.

3   Q.   But all of those collectively, my engagement with the SERP,

4   those are engagement signals?

5   A.   That's right.

6   Q.   In your primer to Mr. Perica you say that those are the

7   most powerful signals here, right?

8   A.   I would agree with that.

9   Q.   Then it says, "If you show the right answer position at

10   3" -- actually, we did this, so if you want to skip it. But,

11   you're basically explaining the example that I walked through,

12   right?

13   A.   Yes. This is a primer. I'm trying to explain to somebody

14   who knows nothing about search the most important parts.

15   Q.   And then you put -- two sentences later, you put, "But in

16   the long tail you don't have enough clicks, so you have to find

17   ways of smearing click signal to more obscure queries in docs."

18   A.   Yes.

19   Q.   So we talked about the tail. And when you're in the tail,

20   one of the reasons something ends up in the tail is because

21   it's misspelled, right?

22   A.   Well, the tail typically refers to the documents you're

23   retrieving, not tail queries. But it can also mean, you know,

24   tail queries as in things which are misspelled.

25   Q.   Okay.

1 A. But that's a very good example where the engagement is not

2 going to save you for misspellings. So you have to do a whole

3 bunch of other things to be able to make -- no matter how many

4 queries you have, you're not going to have enough queries for

5 the tail.

6 Q. Okay. And we'll get to that. But you mentioned spell.

7 One of the things that a search engine does is it corrects my

8 spelling, right?

9 A. That's correct.

10 Q. And I am terrible, so it helps me a lot.

11   They do this by learning what past users meant when they

12 misspelled the word?

13 A. In part. Increasingly, they do it by just reading the

14 entire web and understanding words. That's what the natural

15 language understanding we were talking about before is.

16 Q. And let's Google a history here. From 2010 to 2018, the

17 spellcheck function got better and better for a while because

18 of user engagement and seeing what people meant when they

19 misspelled certain things?

20 A. I'm not sure I'm an expert on all the improvements that

21 were made in spell-checking, but increasingly it's about

22 understanding the mistakes that people make.

23 Q. Sir, when you say "increasingly," you're talking about now.

24 And so what I would like to do is -- and I understand, but I

25 would like to focus on 2010 to 2018. And during that time,

1   user engagement was one important way that search engines

2   became better spellers, right?

3   A.   Yes.   But, again, there are many kinds of user engagement.

4   So if you typed in something and you misspelled it and you saw

5   some results and you didn't click on any of the results, but

6   then you changed how you spelled the thing -- it's a very

7   common thing, it's called reformulation -- and then you got

8   better results and then you clicked on them, then, great.   But,

9   the search engine already had improved your answer before you

10   made the selection.

11   Q.   Okay.   So reformulation is another form of user engagement?

12   A.   Yes.

13   Q.   Okay.   And that's another -- that's an important one in

14   making search engines spell check better?

15   A.   Yes.

16   Q.   And so we'll get back to what you said.   When we're talking

17   about the tail, you talked about smearing, right?

18   A.   Yes.

19   Q.   And that's because -- I mean, people can ask anything, and

20   so some of these questions even a good a search engine with a

21   lot of scale has not seen before, right?

22   A.   The questions, yes.

23   Q.   Okay.   And, so, smearing means taking -- I'm going to ask

24   you.   That's probably a better way.

25   What did you mean by "smearing" there?

1   A.   Smearing would be, like, understanding this query is about

2   sports or this query is about a recipe and, therefore, treating

3   the ranking differently in the tail, if you had understanding

4   of the query in some way. So I'm being very general here. But

5   it's like finding clever tricks to say, oh, you're looking for

6   a rare food item and so we're going to give more preference to

7   documents which appear to be about food, regardless of knowing

8   what you're searching for in that document.

9   Q.   So if I had some past queries that gave me some engagement

10   signals here and here (indicating), and I got a query sort of

11   in between them, I could use some of the engagement signals

12   from the two sides to help me get an answer to the one in

13   between them. Is that fair?

14   A.   Not really. I mean, the point is that as you go further

15   down the tail, there's just not enough queries. And, so, you

16   would have to start analyzing the documents and the meaning of

17   the documents much more so. So, you know, the tail is called

18   the tail for that reason. You have to use a different set of

19   techniques to do a good job of ranking in the tail, if you just

20   want to find the word that you typed in the tail. But that's

21   not necessarily going to give you the document you're looking

22   for.

23   Q.   I'm going to focus on my question. My question is: Along

24   with those techniques, the fact that you had seen not the same,

25   but similar or potentially related queries to the new one helps

1   respond to the new one?

2   A.   I mean, "smearing," which is what we're talking about here,

3   generally means learning things in the head and torso that help

4   you out in the tail. So that's, you know, not the same thing

5   as clicks.

6   Q.   And farther down you write --

7   THE COURT: I'm going to interrupt you, if I can.

8   MR. DINTZER: This is a good time for a break, Your

9   Honor.

10   THE COURT: Okay. Great. Let's take our break this

11   morning. It's a little after 10.

12   MR. SCHMIDTLEIN: If I can just make an observation

13   here. We've got a time problem. The United States represented

14   that they were going to need an hour and a half with this

15   witness. They are now approaching two hours with the witness,

16   and I don't think Mr. Dintzer is close to being done. I have

17   an examination of this witness.

18   You, prior to the trial, I think, specifically denied

19   a request by them to lead third-party witnesses like this

20   witness. He has led -- he's asked leading questions all

21   morning and all yesterday and I haven't objected because I

22   want -- I'm trying to allow this to facilitate. I have two

23   Google executives who have been here all week because they were

24   forecast to go earlier in this week. We have got a major

25   problem with the government not adhering to, sort of, the time

1   periods, and it's coming to a head today.

2   THE COURT: All right. Why don't we give

3   Mr. Giannandrea a break, and we'll talk about scheduling and

4   timing for the rest of the day. I'll just ask him to step out.

5   MR. DINTZER: Sure.

6   THE COURT: Okay. Where are we in terms of his

7   examination by plaintiffs?

8   MR. DINTZER: I'm two-thirds done. I mean, I'm just

9   looking at the page numbers and I'm two-thirds done, Your

10   Honor. I have been doing my best to lead to speed things

11   along, but I've also asked him intentionally open-ended

12   questions in the spirit of what the Court asked us to do. If

13   the Court would prefer, I can lead more aggressively to move us

14   faster. But I was trying to be in the spirit of, basically,

15   giving him a chance to give open-ended answers on things.

16   THE COURT: So, you know, give me a time. You're

17   talking about another 30, 45 minutes?

18   MR. DINTZER: I think I can finish in 45 minutes,

19   Your Honor.

20   THE COURT: Plaintiffs are going to have questions?

21   MR. CAVANAUGH: I don't anticipate any, Your Honor.

22   MR. DINTZER: I will try to do some pruning during

23   the break, Your Honor.

24   THE COURT: Mr. Schmidtlein, what do you think in

25   terms of how long you'll be?

1   MR. SCHMIDTLEIN: I have at least an hour with this

2   witness.

3   THE COURT: Look, I think we're still on track to be

4   done with him today. I don't know whether he's got a flight at

5   a particular time this afternoon or evening?

6   MS. HOFFMAN LENT: No, Your Honor. He's available

7   today, but only today.

8   THE COURT: Okay. All right. Let's just take our

9   break. I may need to move a few things this afternoon to push

10   him toward the back of the afternoon.

11   MR. DINTZER: We appreciate that, Your Honor. We're

12   at the Court's convenience, of course.

13   THE COURT: Okay. Thank you, everyone.

14   MR. DINTZER: How long of a break, Your Honor?

15   THE COURT: 15 minutes. We'll be back at 11:30 --

16   little bit before 11:30.

17   (Recess.)

18   THE COURT: Mr. Giannandrea, can you just quickly

19   clarify one thing for me? I know why I was now confused about

20   the Apple suggestions in Safari, because it's not -- the

21   suggestions don't appear in an incognito mode, do they?

22   THE WITNESS: Probably not because we probably don't

23   intercept your query and do analysis on it.

24   THE COURT: Okay. It all makes sense to me now.

25   Thank you. I did my own experiment during the break.

1   MR. DINTZER: Are we ready to proceed, Your Honor?

2   THE COURT: Correct.

3 BY MR. DINTZER:

4 Q. So we're still on Exhibit 266. I'm going to try to do a

5 little marching, to make sure we keep moving here.

6   On Exhibit 266, the third to last sentence on that page

7 we've been looking at, you write, "The way that you figure out

8 whether a search algo change was good is that you use human

9 raters to rate thousands of random queries with and without the

10 change and you consider the overall impact of the change." Do

11 you see that?

12 A. I do.

13 Q. And you're explaining an A/B experiment; is that right?

14 A. Bradley, yes, he did the evaluation.

15 Q. And what happens is you make a change for X people and you

16 have the same number of people, roughly, who are your control

17 and then you compare them?

18 A. Broadly speaking, yes.

19 Q. And the number of experiments that a search engine can do,

20 like this, can be constrained by the number of queries they see

21 in a day or week?

22 A. Well, you only need thousands of queries out of billions,

23 so you can typically run hundreds or thousands of experiments

24 at the same time.

25 Q. If you have billions of queries?

1   A.   Right.

2   Q.   But you can't do more experiments -- I mean, they each have

3   to have a certain number of people. You can't do more

4   experiments than you have queries to divide them up and make

5   controls and the like?

6   A.   Well, they have to be statistically relevant. But it's

7   relatively fractions of the percentage of the queries that you

8   have.

9   Q.   Well, that Google has?

10   A.   That Apple has.

11   Q.   Okay. And then the very last sentence of this whole

12   primer, still on UPX66 (sic), you write, "Hopefully, this

13   explains why a world-class search engine is at least █████

14   █ billion a year R&D investment, and that is before you build

15   the search ad business to pay for it," right?

16   A.   That's what I wrote, yes.

17   Q.   And you believed it when you wrote it?

18   A.   Yes.

19   Q.   And I don't have any other questions on that document, sir.

20   Now, in 2016 -- we talked about mobile queries. 2016-

21   2018, the breakdown of Google Search queries from Safari were

22   half mobile and half desktop; is that right? Roughly?

23   A.   Sorry. Between?

24   Q.   2016-2018, the Safari queries that went to Google, half

25   desktop, half mobile?

1   A.   I wasn't at Apple at that time. But somewhere in there

2   50-50 was crossed, yes.

3   Q.   And it was crossed because before whatever that crossing

4   point, desktops had more queries than mobile and after that

5   crossing point mobile had more queries than desktop?

6   A.   That was generally happening in the industry, yes.

7   Q.   And in over the last few years more queries are being done

8   on mobile than on desktop?

9   A.   Yes, that's true.

10   Q.   UPX618. And this is an email from you, sir; is that

11   correct? At least the top one is. It's an email exchange

12   between you and Mr. Cook?

13   A.   Yes, it is.

14   MR. DINTZER: We'll offer this, Your Honor.

15   MR. SCHMIDTLEIN: No objection.

16   THE COURT: 618 will be admitted.

17   BY MR. DINTZER:

18   Q.   The first part talks about a meeting with Google; is that

19   right?

20   A.   The first part is me talking to -- telling Eddy that I was

21   aware of the conversations Peter Stern was having with Google.

22   Q.   Who is Peter Stern?

23   A.   Peter Stern was a business development person working for

24   Eddy Cue.

25   Q.   The first sentence of the second paragraph says, "Then

1   there is the second issue of displaced queries that Siri is

2   trying to answer."

3   Do you see that?

4   A. I do.

5   Q. And the third paragraph -- and these are the ones that we

6   talked about, the intercepted queries, right?

7   A. That's correct.

8   Q. And Apple intercepts queries on Safari and on Siri; is that

9   right?

10   A. And in the Spotlight.

11   Q. And in Spotlight. And then the third paragraph you write,

12   ██

13   ██

14   ██

15   ███████████████████████████████████████   Do you see

16   that?

17   A. I do.

18   Q. So was the suggestion from Google that Apple turn off all

19   displacement of queries?

20   A. No. My understanding was that Google was concerned that

21   the quality of our displaced queries was not very high and,

22   therefore, not good for users. And I agreed with that, ████

23   ██

24   ██

25   ██████████████████████████████████.

1 Q. And Google had an interest in Apple stopping the displaced

2 queries because Google wasn't getting them?

3 A. Yes, they thought there were commercially valuable queries

4 that we were displacing with things like Wikipedia pages that

5 made no sense to them, or to me.

6 Q. But you understood Google had a financial interest in this

7 displacement issue?

8 A. Well, they were search experts and they were perplexed by

9 why we were implementing it the way we were implementing it.

10 Q. Right. But I need you to answer my question. You

11 understood that Google had a financial interest in Apple not

12 displacing its queries?

13 A. Yes.

14 Q. And as part of this you write, "███████████████████████

15 ██

16 ████████████████████████?

17 A. ████   As we've discussed, it was our strategy to give

18 answers when we had them.

19 Q. And get people to where they're going faster?

20 A. Correct.

21 Q. And then the, "B, ███████████████████████████████████

22 █████████████████████████████████

23   ██████████████████████████████████

24 ██

25 █████████████████████████

1   A.   ████████████████████████████████████

2   ████████

3   Q.   ████████████████████████████████████

4   ███████████████████████████

5   A.   ██

6   Q.   ██████████████████████████████████████

7   ██

8   ████████████████████

9   A.   ██

10   ██████████████.

11   Q.   ████████████████████████████████████

12   ██?

13   A.   That's not what I said here. But, yes, that's true also.

14   Q.   And so Apple did not want to turn off all displacement of

15   queries and fall back to Google for everything?

16   A.   Well, I was saying we can't just turn it off, yes.

17   Q.   You were against it?

18   A.   Yeah. It was my judgment to make, I think.

19   Q.   Did Apple -- well, I'll get to that. No further questions

20   on that, sir.

21   UPX242. And you write -- I'm sorry, this is an email

22   from you to Mr. Perica, who we've already discussed, is that

23   right? In fact, there's an email chain.

24   A.   Yes.

25   MR. DINTZER: Okay. Your Honor, we'll offer this for

1   admissibility.

2   MR. SCHMIDTLEIN: No objection.

3   THE COURT: 242 will be admitted.

4   BY MR. DINTZER:

5   Q. And Mr. Perica writes to you. And I'm going to look at

6   your response to Mr. Perica. This is November 2018. Do you

7   see this?

8   A. I do.

9   Q. The third paragraph, you write, "I have been living on Bing

10   for the last few days. Mostly it works fine, then in the odd

11   long tail query it just doesn't." Do you see that?

12   A. I do.

13   Q. Okay. And when you say, "I've been living on Bing," was

14   that on the mobile or was that on desktop, or both?

15   A. I don't recall.

16   Q. You don't remember which side you were investigating it

17   for?

18   A. I probably would have done both.

19   Q. You said, "Mostly it works fine." So you found that for

20   most answers it was responsive?

21   A. I did.

22   Q. And then you write, "Then in the odd long-tail query it

23   just doesn't." And when you use the term -- we've talked about

24   the tail. What is a long-tail query?

25   A. Well, I gave an example here for a musician.

1   Q.   Right.   And we'll get to that, the Annie Lennox example.

2   And that's great, but let's get a definition before we do that.

3   A.   It's something that people would search for very rarely.

4   It's not that people would search for this musician rarely, but

5   the first band is very obscure.

6   Q.   I've never heard of it.

7   And, so, it gets -- it says -- the next thing is, "A

8   recent example is Annie Lennox's first band.   Google gets the

9   Tourists as a web answer.   Bing highlights the same answer, but

10   shows a box highlighting the Eurythmics.   This worries me a

11   lot."   Do you see that?

12   A.   I do.

13   Q.   And Microsoft is seeing fewer queries and that affects its

14   answers in the long tail; is that right?

15   A.   No, this specific example, they got the right answer but

16   then they showed the wrong box.   So their implementation was

17   just poor.

18   Q.   And, so, the issue that you had with Bing was in the long

19   tail; is that right?

20   A.   Yeah, I think I said that here, which was in using it for a

21   few days, I was worried that they were significantly worse in

22   the long tail.

23   Q.   Okay.   And in 2018 Microsoft had a series of meetings with

24   Apple; is that right?

25   A.   That's correct.

1   Q. They met with Apple's executives?

2   A. Yes.

3   Q. And there was a discussion about whether Apple would want

4   to use Bing?

5   A. Yes.

6   Q. And there was a discussion about whether Apple might want

7   to acquire Bing?

8   A. There was a broad discussion about options, yes.

9   Q. And a discussion about whether Apple might want to do a

10   joint venture with Bing?

11   A. Yes.

12   Q. And you participated in at least some of the meetings with

13   Microsoft?

14   A. Some of those meetings, yes.

15   Q. And Microsoft provided search-quality evaluation,

16   methodology, and results. They showed you some of what's going

17   on inside?

18   A. Yes, they were making the case for how they thought Bing

19   was doing relative to Google.

20   Q. Did you feel like Microsoft was providing honest and open

21   information about Bing?

22   A. Honest, yes. But I think they were also grading their own

23   homework.

24   Q. You use that term to mean that they were overstating their

25   quality?

1   A.   No, just that the evaluations they showed us were their

2   evaluations. If we had wanted to independently evaluate in

3   2018, we would have done so.

4   Q.   Now, Microsoft told Apple in 2018 that they didn't have

5   mobile queries at scale; is that right?

6   A.   I recall they did represent that, yes.

7   Q.   Okay. And you described that as the scale of the problem?

8   A.   I'm sorry, when did I do that?

9   Q.   That was a problem for Microsoft, the failure to -- the

10 absence of data at scale on mobile?

11 A.   In my summary to Mr. Perica I made comments like that.

12 Q.   And you agree that Microsoft has a very small footprint on

13 mobile devices with respect to Bing?

14 A.   I don't know what the exact size is. They have an app,

15 they have users who switch to them. But it's small relative to

16 Google.

17 Q.   And Microsoft doesn't have significant mobile traffic for

18 Bing; is that right?

19 A.   What do you mean by "significant"? I mean, they have

20 millions of users, but they don't have as much traffic as

21 Google does.

22 Q.   Tim Cook, Mr. Cook was aware of the Microsoft meetings?

23 A.   He was aware they were going on, yes.

24 Q.   And you updated Mr. Cook on the Microsoft discussions at

25 least a couple times in person?

1   A.   Yes, that I recall.

2   Q.   You kept him up to date about the potential options with

3   respect to Bing?

4   A.   Not all of the options. I think that was Mr. Perica and

5   Eddy's job.

6   Q.   Because they were on the business side?

7   A.   Yes.

8   Q.   And let's go to UPX460. And we'll offer -- well, I guess

9   I'll ask first.

10   Sir, this is an email and a slide deck. Do you see

11   that?

12   A.   I do.

13   Q.   And you were on this email; is that correct?

14   A.   Yes.

15   Q.   And you had seen -- you saw this slide deck both around the

16   time that it was -- at the time that it was given to Mr. Cook;

17   is that right?

18   A.   Yeah. This looks like an email in advance of a meeting to

19   present the slide deck to Mr. Cook.

20   Q.   Would you have been at that meeting when the slide deck was

21   presented?

22   A.   I was not at that meeting.

23   Q.   Okay. But you saw the slide deck either before or after?

24   A.   Yes, I reviewed the slide deck probably several times.

25   MR. DINTZER: Your Honor, we'll offer UPX460.

1   MR. SCHMIDTLEIN: No objection.

2   THE COURT: Okay. It will be admitted.

3   BY MR. DINTZER:

4   Q. And on the email Mr. Perica writes, "Tim, attached is our

5   draft analysis regarding the Microsoft-Bing search and

6   advertising opportunity." Do you see that?

7   A. I do.

8   Q. And so the next page is a slide deck titled Search and

9   Advertising. Do you see that?

10   A. I do.

11   Q. And let's go to slide -- its Bates number is -- the last

12   four digits are 3171.

13   A. Okay.

14   Q. And this is the alternatives that are being presented to

15   Mr. Cook?

16   A. Yeah. The slide in front of me is the next slide now.

17   Q. I'm sorry?

18   A. The slide on the display is the next slide. There we go.

19   Q. No, I appreciate it. Thank you, sir. And we're going to

20   try to make that a little bigger so all of us can see it.

21   So these are the alternatives that Apple was thinking

22   about with respect to the 2018 discussions with Microsoft?

23   A. Is that a question?

24   Q. Is that correct?

25   A. These are the alternatives being presented in this deck.

1   Q.   These are the alternatives that Apple was considering?

2   A.   No, these are the alternatives that Adrian's team was

3   presenting that day.

4   Q.   Did you have a feeling that Mr. Perica didn't really take

5   any of these options seriously?

6   A.   No, but I thought some were more likely than others.

7   Q.   Of course. But all four of the options on the search

8   alternatives, these were ones that were at least being

9   investigated by Apple as potential options?

10   A.   Investigated by some teams at Apple, yes --

11   Q.   Fair enough.

12   A.   -- as potential options.

13   Q.   As potential options.

14   Now, the first alternative, going left to right, is to

15   grow Siri organically. Do you see that heading?

16   A.   I do.

17   Q.   And that option means that -- to build Apple Search

18   in-house, not really doing anything with Microsoft?

19   A.   That's correct.

20   Q.   And the upshot of that would be Google -- I mean, Apple

21   would continue to rely on the ISA for ad revenue, right?

22   A.   And that we would continue to invest in our own search

23   solution.

24   Q.   Okay. The second alternative presented to Mr. Cook was

25   collaboration on Knowledge Graph feature; is that correct?

1   A. Yes.

2   Q. And that would be collaboration with Microsoft?

3   A. Yes. This gets to the thing we talked about before about

4   knowledge graphs, sharing knowledge graphs.

5   Q. And the first bullet says, "Improve Siri Spotlight question

6   answering abilities." So that was one of the elements, if it

7   went down that road; is that right? That was one of the

8   benefits?

9   A. Yes. The implication here is if we collaborated on

10   Knowledge Graph, that the two companies could have more

11   coverage. Therefore, that would improve that particular

12   feature for Apple.

13   Q. Then the third alternative is co-ownership of Bing, right?

14   A. Yes.

15   Q. And this was the choice of investing with Bing?

16   A. Yeah, this is what would be commonly called a joint

17   venture.

18   Q. And it lists as a benefit of co-owning Bing, it would

19   increase Bing's mobile reach by giving them iPhone search

20   traffic?

21   A. Correct.

22   Q. So this recognized that if Bing had more mobile search

23   traffic, their quality would improve?

24   A. I don't -- I mean, that's not what this says. I think it

25   says it was obvious if we did a joint venture, then we could

1   help Bing get more mobile traffic.

2   Q.   Right.   But one of the benefits of getting Bing more mobile

3   traffic was it would help them improve their response on mobile

4   queries, right?

5   A.   It would also help them make more revenue for mobile.

6   Q.   Fair.

7   The second -- so this is set up so there's two blocks.

8   The top blocks are the benefits and the bottom set of blocks

9   are considerations; is that right?

10   A.   Yeah, basically pros and cons.

11   Q.   And on the cons of co-ownership with Bing, the second

12   bullet, says, "Terms and economics of new search deal and

13   impact to Google relationship," right?

14   A.   I see that.

15   Q.   So a joint venture with Bing could -- one of the cons would

16   be both there's an existing contract that would have to be

17   dealt with, and Apple's relationship with Google could take a

18   nosedive?

19   A.   Well, it says "impact."   I mean, this is a business deck.

20   Obviously, if we entered into a joint venture with Bing, it

21   would have implications for the Google relationship.

22   Q.   Negative implications?

23   A.   Hard to say.

24   Q.   Really?   If Google entered into a joint venture with Bing,

25   you could predict that it would have negative impacts on

1   Apple's -- I'm sorry. Let me start that one again. I wandered

2   down the wrong road.

3   If Apple entered a joint venture with Bing, that would

4   have negative implications on Apple's relationship with Google,

5   right?

6   A. It could make re-negotiation of the ISA more competitive.

7   Q. So, I'll turn it around. Apple -- I mean, it writes here,

8   under cons -- cons, not benefits -- an impact to Google

9   relationship. So, you and whoever else signed off on this deck

10   realized that a joint venture with Bing could have a con,

11   negative impact to Google relationship, right?

12   A. I think it would introduce a lot of uncertainty, is

13   probably what's being implied here. I mean, I didn't sign off

14   on this deck. This is a deck of proposals and preliminary

15   ideas from Adrian Perica's team.

16   Q. But you reviewed it --

17   A. I reviewed the deck, yes. For sure.

18   Q. Fourth alternative: Acquisition of Bing. Do you see that?

19   A. I do.

20   Q. The second bullet for considerations is: Timing relative

21   to Google contract?

22   A. Yes.

23   Q. And the third bullet is: Requires commitment to compete

24   with Google against their core product?

25   A. I see that.

1   Q.   And so, did you understand that Apple's acquisition of Bing

2   would put it directly in competition with Google?

3   A.   There's a lot of detail in this very long deck. I think

4   the observation here was that if we wanted to acquire Bing, we

5   would need some period of time to make it better than Google,

6   and so the timing of that would need to be taken into

7   consideration by the business people.

8   Q.   Right. And acquiring Bing by Apple would put Apple in

9   competition with Google, right?

10   A.   I think the consideration being described here is that it

11   would probably put us in head-to-head competition with Google

12   and that was one of the options and had implications.

13   Q.   And one of those implications would probably be the end of

14   the ISA?

15   A.   Probably.

16   Q.   Now, in 2018 you advised against a Bing deal, right?

17   A.   I did.

18   Q.   I'm going to ask you some more questions about -- actually,

19   I have no further questions on that document, sir. Wait. No,

20   no, I take it back. I'm going to ask you one, but let me set

21   it up, first.

22   Mr. Cook told Microsoft in 2018 that there would be no

23   deal regarding Bing, right?

24   A.   There was a meeting where we decided not to proceed with

25   our proposal, yes.

1   Q.   And Mr. Cook specifically told Microsoft that?

2   A.   I believe so, yes.

3   Q.   And let's go to page 3177. And the title is: Illustrative

4   modeling. 2022 side-by-side comparison. Do you see that?

5   A.   I do.

6   Q.   And this compared Google revenue share baseline with an

7   Apple search product; is that right?

8   A.   Yes.

9   Q.   And the second box on the right says, "Apple takes on about

10   ▓ billion in annual serving and operating costs. Could

11   potentially offset with savings from Siri program;" is that

12   right?

13   A.   That's what it says.

14   Q.   So the estimation was that it would be $▓ billion annually

15   to serve and operate Apple search?

16   A.   Incrementally over what we were already spending, yes.

17   Q.   Okay. And now no further questions on that document, sir.

18   So we did 2018. Let's talk about 2020. In 2020

19   Mr. Perica's team was again talking to Microsoft about Bing

20   opportunities; is that right?

21   A.   I think it was an ongoing series of conversations from 2018

22   onwards.

23   Q.   And you were involved in the 2020 talks as well; is that

24   right?

25   A.   I recall being at at least one meeting in 2020, maybe two.

1   Q. You attended meetings both with him and a business

2   development person from Microsoft; is that right?

3   A. If I recall, they had hired new leadership for Bing and had

4   made further investments and wanted to come back and make their

5   case again.

6   Q. And that was Mr. Parakhin, right?

7   A. That was the technical leader they had hired. So I had at

8   least one meeting with him.

9   Q. He had previously been at the head of Yandex; is that

10   right?

11   A. He was, yes.

12   Q. And Yandex is?

13   A. Is the number one search engine in Russia.

14   Q. Okay. And Mr. Parakhin told you that between 2018 and 2020

15   Microsoft continued to invest in Bing; is that right?

16   A. Yes. He characterized it as they had sort of rebooted and

17   had a new strategy.

18   Q. And continued to improve?

19   A. And continued to improve, that's correct.

20   Q. You decided, in 2020, to do a study, right? A comparison

21   of Bing and Google?

22   A. I think late 2020, early 2021.

23   Q. And Mr. Cook or Mr. Cue, they didn't ask you to run the

24   study?

25   A. No.

1   Q.   The ISA extension discussions, those didn't have anything

2   to do with your decision to run the study?

3   A.   No.   The way I would characterize it was that Bing was

4   telling us yet again that they had parity with Google, and so I

5   decided, together with Mr. Perica, to ask their permission to

6   run a study that we would run, and that's what we did.

7   Q.   "We" being whom?

8   A.   Apple.

9   Q.   So Mr. Perica knew about the study?

10   A.   He did.

11   Q.   In 2020 you instructed your search evaluation people to do

12   a head-to-head evaluation of Bing and Google?

13   A.   Late 2020, I think, yeah.

14   Q.   Late 2020.   I'm happy to say 2021, if you --

15   A.   Yeah, I think we had the conversation with Microsoft just

16   before the Christmas shutdown, then I instructed the team in

17   January to get started on it.

18   Q.   Okay.   So 2021.   And a detailed evaluation of search

19   engines is a significant technical undertaking?

20   A.   Yes.   It's not inexpensive to do, yep.

21   Q.   Different search engines use different techniques to

22   measure the quality of their results?

23   A.   Is that a question?

24   Q.   Question mark.

25   A.   Broadly they use the same technique, which is to use

1   side-by-sides and human eval raters.

2   Q.   And just -- I promised my team I wouldn't write anymore.

3   But, just, side-by-side -- side-by-side is when you push

4   queries -- and we'll get to this -- through the systems and

5   then put side-by-side Googles on one and Bings on the other so

6   that a reader can evaluate them next to each other?

7   A.   Yes.

8   Q.   And you believe that that's the best practice of doing an

9   evaluation?

10   A.   It's how evaluations are done for changes to, say, Bing.

11   They would do the same thing, they would take a search result

12   without some proposed change, a search result with a proposed

13   change and then they rate an evaluation and that's how they

14   would decide to chip an improvement.

15   Q.   And you think that's the best way of doing it?

16   A.   It's the best practice in the industry, yes.

17   Q.   The 2021 eval was Apple's only technical evaluation of

18   Bing's search; is that right?

19   A.   We've done it since then.

20   Q.   And when did you do it since?

21   A.   Most recently, in early '23.

22   Q.   The 2020 evaluation, you used the term "best practices."

23   In fact, you did the 2020 evaluation using best practices; is

24   that right?

25   A.   Yes. Between 2018 and 2021 we had built up and continued

1   to invest in Apple's ability to do search side-by-sides █████

2   ███████████████████████. And so we actually had, you know, a

3   fairly credible search evaluation team, mostly hired from

4   Google, working at Apple.

5   Q. And so, when Apple does -- just so I capture this: ██

6   ███

7   ██

8   ███████?

9   A. That's correct.

10   Q. As part of the Bing-Google side-by-side, your employees

11   showed you the methodology that they were going to use for the

12   evaluation and you approved it?

13   A. It was very similar, yes.

14   Q. Do you think that that's part of the best practices, having

15   a written evaluation process before the actual testing begins?

16   A. Yes, it's common to do that.

17   Q. Okay. And for the 2020 evaluation, you took a

18   statistically meaningful number of Safari queries and you ran

19   them on both those systems, right? Bing and Google?

20   A. Yeah, if I recall, we did what I would describe as the

21   minimally viable, credible, you know, first evaluation, and

22   that was to take Safari desktop queries, Safari mobile queries,

23   Spotlight desktop queries, Spotlight mobile queries and then

24   run them through evaluations for -- I think we did three

25   languages.

1   Q.   And the graders graded two separate things; both relevance,

2   as well as overall preference?

3   A.   That's correct.

4   Q.   And then you instructed your staff to show you the results

5   several months later?

6   A.   Yes.

7   Q.   Okay. And you separated out -- you mentioned this: You

8   separated out the desktop and the mobile completely. I mean,

9   they did two separate sets of analysis, right?

10   A.   Two different sets of queries, yeah.

11   Q.   Okay. And that means that you had, sort of, one query set

12   that were mobile and then another query set that were desktop,

13   right?

14   A.   That's correct.

15   Q.   And on the evaluation side you evaluated the desktop side

16   by side and then you evaluated the mobile side by side?

17   A.   That's correct.

18   Q.   And you think that was best practices, too?

19   A.   Yes.

20   Q.   And you did this because -- the two different search

21   properties because the query mixes might be different?

22   A.   Because of the query mix mostly, for this particular

23   experiment.

24   Q.   Now, Bing is primarily machine-language driven; is that

25   right?

1   A.   Well, they represented to us at the time that they were

2   leaning more heavily into natural language machine learning and

3   that this would be the future of search. And I don't think

4   they were completely wrong about that, but they were certainly

5   more gung-ho on it than Google was.

6   Q.   Mr. Scott actually told you that Bing was leaning

7   aggressively to machine learning in 2018?

8   A.   Yes, he told us about a HR and Microsoft project they

9   called tiering, which, with hindsight, was their first major

10   foray into large language models.

11   Q.   Let's go to UPX260. What are we looking at here, sir?

12   A.   One second.

13   So this looks like the presentation from my team of

14   this first May 2021 Bing evaluation.

15   Q.   You called Mr. Cue and you summarized this presentation for

16   Mr. Cue; is that right?

17   A.   Sometime after this, I believe I did, yes.

18   Q.   Okay. And so these are the results. And so we're just

19   going to march through these results. And we're going to go to

20   the fourth slide, which in the corner is 6678 of --

21   MR. DINTZER: Your Honor, this is in evidence.

22   BY MR. DINTZER:

23   Q.   -- of UPX260. And this is sort of an overview, is that

24   correct?

25   A.   ███

1   ███████ .

2   Q.   And in the notes, the bottom line says, "For most head

3   queries, like," paren, "Amazon, graders do not have a strong

4   preference one way or the other." Do you see that?

5   A.   Yes.

6   Q.   So for most head queries there was not a strong preference

7   between Google and Bing; is that right?

8   A.   Yeah. I think they were describing that this task design

9   wouldn't capture graders' opinions about it either way.

10   Q.   Okay. Let's go to slide 7, which is Bates number 6681.

11   A.   Okay.

12   Q.   And the top part addresses the relevance of the results.

13   Do you see that --

14   A.   I do.

15   Q.   -- in a slide?

16   And it says, "For result relevance, Google wins big

17   almost everywhere except for en-US desktop with Safari queries,

18   which is a tie." Do you see that?

19   A.   I do.

20   Q.   So in English, in the US Google and Bing tie for relevant

21   results on desktop?

22   A.   That's what this says, yes.

23   Q.   I mean, this is the results of your company's own study,

24   right?

25   A.   Yeah, this is the summary slide. The detailed slide is

1   684.

2   Q. Okay. And we'll get there. I'm trying to march through

3   this as quickly as we can.

4   So, but, I mean, that is what the slide says?

5   A. Yeah, it says that result relevancy in en-US desktop for

6   Safari queries was a tie for this particular evaluation.

7   Q. And en-US desktop means English US desktop results?

8   A. Yes.

9   Q. And it says, in the bullets below that top bullet, "Google

10   has a much larger lead on mobile than desktop." Do you see

11   that?

12   A. I do.

13   Q. And you believe that's accurate.

14   A. That's what it says on the detailed slides later on.

15   Q. You don't have any reason to doubt it?

16   A. No.

17   Q. And then the bottom part of that slide says, "For overall

18   preference, Bing outperforms Google on desktop UI and diversity

19   in en-US, but that lead is weaker in" -- what I assume is

20   France and Japan?

21   A. That's correct.

22   Q. And what does "UI" stand for there?

23   A. User interface.

24   Q. So in the 2020 eval that Apple did, Bing beats Google on

25   the UI and diversity in English in the United States?

1   A.   Yes.   And the speaker notes down here explains why that was

2   not a surprise.

3   Q.   Let's go to those.   First -- it says, "First, Google has a

4   strong lead in relevance, in particular for long-tail queries

5   and in international locales, right?

6   A.   On both mobile and desktop, yes.

7   Q.   On both mobile and desktop.   And you don't doubt that at

8   all, right?

9   A.   No.

10   Q.   And then -- so in the US, Google strength was in long-tail

11   queries, right?

12   A.   In relevance generally, yes.

13   Q.   Okay.   And then it says, "On the other hand, we heard that

14   Bing has invested heavily in desktop features; in particular,

15   in English US.   It's good to confirm that eval that Bing in

16   English US desktop is actually preferred"?

17   A.   For preference, yes.   So what the eval people were saying

18   here was the eval was showing a result that was expected,

19   therefore, it was probably trustworthy.

20   Q.   And we talked about this.   They're evaluating on two

21   things: They're evaluating on relevance and preference?

22   A.   Yes.

23   Q.   And relevance is how accurate the result is.   And

24   preference is how much people just generally like the result

25   better between the two?

1   A. The graders, yes.

2   Q. And preference included relevance, right?

3   A. Preference includes relevance, yes.

4   Q. Okay. So it's not -- okay. And so let's go to slide 31.

5   That's 6705 in Bates.

6   This is the data you wanted to look at, so I wanted to

7   take you there. Do you see that, sir?

8   A. Yes.

9   Q. Okay. And so if we look on the left side, the desktop

10   slide, for relevance in the United States, we see that the blue

11   bar is up, so Google -- let's explain the slide a little bit

12   more.

13   Google being better is up, and Bing being better is

14   down, is that right, on the desktop slide?

15   And the screen is bigger, if that helps.

16   A. It's a pretty busy slide and it doesn't have a good legend.

17   Q. Right. But Google better is up, and Bing better is down?

18   A. Yeah, I think that's right.

19   Q. Okay. And then along the bottom we see the different

20   countries that we're looking at, right?

21   A. Yeah. There's only three here, but --

22   Q. Okay. And we're going to focus on the US. And for the US

23   on relevance, there's a tinny little bump where -- for Safari,

24   where Google is better on relevance; is that right?

25   A. Yes.

1   Q.   And for -- what's the second one? It has an American flag

2   and it has a magnifying glass.

3   A.   That would be Spotlight in the US.

4   Q.   Okay. And for Spotlight, Google is more relevant, a little

5   higher up than Bing on desktop; is that right?

6   A.   For this eval, yes.

7   Q.   And then on the subjects of presentation, diversity, and

8   overall, Bing is better than Google on desktop for this study?

9   A.   In this study, yes. That's what summary said as well.

10   Q.   And you have no reason to doubt that? You don't have

11   another study done in 2020, right?

12   A.   No, but the nature of these studies is they're very

13   statistically noisy. But for this study, that's what it says.

14   Q.   Is it right, that a study like this, you would want to do

15   multiple times because you find them statistically noisy?

16   A.   Yes. Specifically, the set of queries is completely

17   random, so you're selecting 1,000 queries out of bins, you're

18   doing the study -- if you do the study next week with a

19   different set of thousands of queries, you will get some amount

20   of noise in the evaluation.

21   Q.   But you signed off on this study, right?

22   A.   I don't know what you mean by "signed off" on it. It was

23   presented to me by my team. I asked my team for the study.

24   Q.   Right. They showed you the parameters before they went to

25   work?

1 A. Yeah. They believed the results were interesting to look

2 at, yes.

3 Q. When you saw the parameters that they presented to you

4 before they went to work, you believed that it was a

5 statistically significant number of queries being fed in?

6 A. Yes. But I also have a lot of experience with these

7 studies, and there's a lot of statistical noise, regardless of

8 the methodology.

9 Q. So then -- now, it's your understanding that Bing is

10 invested heavily in desktop features; is that right?

11 A. Anecdotally, my team, many of which had worked at Google,

12 believed that that's where Bing was putting most of its energy.

13 Q. And what's a feature?

14 A. A future would be something like a one box or a list, the

15 kind of things we were talking about this morning where instead

16 of getting just ten blue links, you're getting an answer.

17 You're getting a fancy UI, basically.

18 Q. And scale is not required for desktop features, right?

19 A. It's an orthogonal issue, I think, for features.

20 Q. It's not relevant?

21 A. Well, it's relevant because you need to decide which

22 features to prioritize.

23 Q. So scale is relevant to decide what futures to prioritize,

24 but it's not relevant in actually putting the features

25 together?

1   A.   No, that's a software engineering investment.

2   Q.   Okay. Bing was optimizing for how the page appeared,

3   rather than the user getting the most relevant answer, right?

4   A.   Yes. And given they were the default on desktop and they

5   were a software company with a lot of experience building

6   software for Windows, it's not a surprise for us.

7   Q.   They also got a fair amount of scale on Bing from the

8   Windows environment?

9   A.   That's true as well, yes.

10   Q.   Now, one conclusion from the 2020 evaluation was that

11   Google outperforms Bing on mobile search; is that right?

12   A.   Yes.

13   Q.   And you were asked, you said you can't definitively say why

14   Google outperformed Bing on mobile search because you don't

15   know the details of Bing's search engine; is that right?

16   A.   Not knowing the difference between the Bing algorithms and

17   the Google algorithms, it's hard to definitively say how much

18   query volume matters.

19   Q.   You've never been on the Bing system?

20   A.   I've never seen the details of the Bing algorithm, no.

21   Q.   And you would need to see the details of the Bing algorithm

22   to make a realistic assessment of how scale affects that

23   algorithm?

24   A.   As a proportion compared to all the other factors, like

25   machine learning, yes.

1   Q. The fact Bing is nowhere on mobile is a challenge or a

2   headwind for Bing. Do you agree with that?

3   A. Given what I understood about how Google algorithms work,

4   yes, I thought it was a headwind.

5   MR. DINTZER: Okay. So we are now to a point, Your

6   Honor, where we are going to ask some questions about Google.

7   And we've been asked by our colleagues to give a heads-up so

8   that the Apple people may excuse themselves.

9   THE COURT: Okay. Does that include all Apple

10   counsel or --

11   MR. DINTZER: I'm sorry?

12   THE COURT: Are there exceptions? No?

13   MS. HOFFMAN LENT: Just in-house, Your Honor.

14   THE COURT: Just in-house counsel. I got you. Thank

15   you.

16   (The following proceedings remain in closed session:)

17   BY MR. DINTZER:

18   Q. And so we're going to go to UPX205.

19   And, sir, this is a deck from Google, that Google

20   produced from April 2015, a research and MI all-hands; is that

21   right?

22   A. Yes.

23   MR. DINTZER: This is in evidence, Your Honor.

24   BY MR. DINTZER:

25   Q. And if you look at the fourth page. Your team, the machine

1   intelligence team is one of the teams that's listed in this

2   deck?

3   A.   Yes.

4   Q.   Okay. And if you go to page -- Bates number 3199, we see

5   which-door-will-she-follow problem.

6   A.   Okay.

7   Q.   Okay. And are you familiar with this problem?

8   A.   Give me one second here.

9   Q.   I'm happy to walk through it, but I'm trying to --

10   A.   Yeah, this appears to be part of a presentation called

11   "Mind Reader," which is about recommendation systems.

12   Q.   It's part of the ranking challenge, right?

13   A.   No, this was a completely different thing. This is

14   recommendation systems for other things.

15   Q.   What's a recommendation system, sir?

16   A.   A recommendation system would be recommending music you

17   might like to play based on what you've played in the past, or

18   YouTube videos that you might want to watch. So this was a

19   research project to see how well you could learn from personal

20   signals, including, I assume, search interactions.

21   Q.   So it was another way to learn through search interactions

22   or engagement; is that right?

23   A.   Some were general research problem on recommendations

24   generally.

25   Q.   If you go to page 3202. The notes say, "Instead of

1   attempting to describe through a noisy process what each door

2   is about, we describe it based on the people who took it;" is

3   that right?

4   A.   Yes.

5   Q.   That's the engagement process, what did people select?

6   A.   This is generally called a collaborative filtering process.

7   But it's a kind of engagement, yes.

8   Q.   Then you write -- not you. But then it says, "We can do

9   this at Google because at our scale even the most obscure

10   choice would have been exercised by thousands of people;" is

11   that right?

12   A.   Yeah. A good example of this would be like YouTube video

13   watching, for example.

14   Q.   And engagement is obtained from -- so, this is not -- is

15   this related to the engagement from general search?

16   A.   For this -- this recommendation project, yes, almost

17   certainly they were able to use the search signals as part of

18   it, but it wasn't a search project.

19   Q.   Okay. No further questions on that document, sir.

20   UPX235. So, this one.

21   MR. DINTZER: Let's see. This is entered, Your

22   Honor.

23   BY MR. DINTZER:

24   Q.   This one, sir, is going to flip things.

25   A.   235?

1   Q. 235, sir. Just let me know when you're there.

2   A. I don't believe I have a 235 here.

3   Q. UPX --

4   A. No, I found it. I'm sorry. I apologize.

5   Q. Okay. So this is going to flip things because this email

6   you're going to be talking about the Apple relationship, but

7   from the seat of Google, where you were in 2016, right?

8   A. Yes.

9   Q. Okay. And so the bottom email is one from Bruce Sewell.

10   Who is he?

11   A. I don't know. Obviously, an Apple employee, but I don't

12   know him.

13   Q. And he writes -- and he's working with Daniel Alegre. Do

14   you know him?

15   A. I think he was in marketing. But no, I'm not familiar with

16   him.

17   Q. And Mr. Sewell writes to Mr. Alegre, "Here is the draft

18   language I propose for the data exchange section. We will

19   have" -- and the subject is: ISA working draft from today's

20   meeting -- "we will have more specificity around this later

21   today." Do you see that?

22   A. I do.

23   Q. ██

24   ██

25   ██

1 ██

2 ███████████████████████████?

3   A.   That's what it says here, yeah.

4   Q.   Okay. ███████████████████████████████

5 ██

6 ██████████████████████████.   Do you see that?

7   A.   I do.

8   Q.   And Mr. Alegre writes to you, and he writes, "We met with

9 Apple yesterday and they had a new request on the dataset

10 request section. They wanted it to be reciprocal, meaning that

11 they want to know which links on google.com results were

12 clicked on, how long it took to satisfy the user's query on

13 Google." Do you see that?

14   A.   I do.

15   Q.   Their rationale was that they wanted to improve their user

16 experience with the information. So this is Apple asking for

17 user engagement data from Google, right?

18   A.   Well, it sounds like they're actually asking for ranking

19 information, like, you know, which position was clicked on, as

20 well as --

21   Q.   That would be part of the engagement information, right?

22   A.   It would be more than that. It would actually leak the

23 ranking signal from Google.

24   Q.   Okay. And he writes, "We gave them the clear heads-up that

25 we don't share this information, as it is key to our secret

1 sauce, but we would discuss with you nevertheless." Do you see

2 that?

3 A. Yes.

4 Q. And then you respond, "What are they trying to learn

5 exactly? They know which queries they hand off to us, so what

6 data are they asking for?" So what was your concern there,

7 sir?

8 A. Right. So this is me in my role at Google, responding to

9 this request from Apple, and I'm saying they know which queries

10 they give us, so what more is it they're trying to learn? They

11 know which ones they displaced, they know which ones the user

12 chose to go to Google or the other search engines, so what is

13 Apple trying to ask us for here?

14 Q. Well, Apple sees the query, but Apple does not see the

15 engagement, the click; is that right?

16 A. They see the click on the suggestion, they don't see the

17 click on the ranked results at Google, yes.

18 Q. So even if the -- if the user ends up on a Google Search

19 page, Apple doesn't see anything else after that?

20 A. That's right.

21 Q. Okay. So they don't see the click, they don't see the

22 scroll, they don't see any of those engagements that we've

23 talked about?

24 A. That's correct.

25 Q. And all of those are part of the information that is the

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 1    secret sauce?  That's what Daniel Alegre writes, correct?
 2    A.   Yes.  Sharing that information would leak the ranking
 3    signal, which you could then use to build another search
 4    engine.
 5    Q.   And you write, "If it's which web pages people ultimately
 6    visit for a query, we would" -- emphasis -- "not share that
 7    ranking signal."  Do you see that?
 8    A.   That's correct.
 9    Q.   So you were against sharing that kind of information with
10    Apple; is that right?
11    A.   Very much so, yeah.
12    Q.   Because it would help them develop a search engine?
13    A.   Well, it's a very proprietary piece of information, how you
14    rank the results.
15    Q.   And my last question is, sir, am I right that in a given
16    year Google would run thousands of tests for proposed
17    improvements to its search product?
18    A.   Yes, typically.
19    Q.   And when you were at Google you had a role in signing off
20    on those and helping select those?
21    A.   Typically not.  The way it usually worked was engineers
22    would request evaluations and then if they got positive
23    results, they would come to us and ask for us to sign off on
24    chipping the change at scale on google.com.
25    Q.   And those evaluations were live experiments, right?
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1   A. Typically, yes.

2   Q. Google never made a change to its algorithm without doing a

3   live experiment, right?

4   A. I wouldn't say never, but typically no.

5   Q. The process was if an experiment was approved, it would be

6   one of the those A/B experiments, but it would be live, it

7   would run on the system, right?

8   A. Right, but it was a very common practice, so it would be

9   approved low down in the organization.

10   MR. DINTZER: With that, Your Honor, we have no

11   further questions -- let me check.

12   (Pause.)

13   MR. DINTZER: No further questions and we pass the

14   witness.

15   MR. SALLET: No questions.

16   MR. SCHMIDTLEIN: Your Honor, can I make a

17   suggestion? I have just a couple of questions for the witness

18   about the Google material that I could ask right now, before we

19   take our lunch break, but with Apple's counsel out, and then we

20   could resume with Apple's counsel back in.

21   THE COURT: That's fine. Why don't we go ahead and

22   finish up that portion.

23   MR. DINTZER: Also, Your Honor, if it conveniences

24   the Court and witness, we would be happy to cut the lunch break

25   a little bit.

1   THE COURT: Let me see where Mr. Schmidtlein is

2   before we make that decision. Go ahead.

3   CROSS-EXAMINATION

4   BY MR. SCHMIDTLEIN:

5   Q. Good afternoon, Mr. Giannandrea.

6   You were just asked a question by Mr. Dintzer about

7   providing information regarding clicked-on Google Search

8   results back to Apple. And this was a question that came up to

9   you while you were working at Google; is that right?

10   A. Yes.

11   Q. And I believe you described that as -- if that information

12   was provided, it would essentially provide Apple with the data

13   that could allow them to figure out Google's ranking signal; is

14   that right?

15   A. It would leak the ranking signal, yes.

16   Q. And did Google -- while you were at Google, did Google

17   treat the ranking signal as proprietary information?

18   A. Yes.

19   Q. Did Google treat all of its algorithms and signals as

20   proprietary information?

21   A. Very much so, yes.

22   Q. If any other browser that Google had a default search

23   engine relationship with had asked for that click information,

24   would Google's response have been the exact same?

25   A. I believe it would, yes.

1   Q. In other words, if Mozilla or Opera or any other browser

2   where Google had an agreement to be the default search engine,

3   if that browser had asked for click data, what would Google's

4   response have been -- or, what would your recommendation have

5   been?

6   A. I would be strongly opposed to it.

7   Q. Okay. I believe you were also shown some documents --

8   strike that.

9   During your time at Google, you were -- I think you were

10   asked some questions about when Google and Apple would have

11   conversations about whether Apple's suggestions were delivering

12   a good user experience, rather than allowing Google's

13   suggestions to trigger instead. Do you recall that?

14   A. Yes.

15   Q. And while you were at Google, did the Google and Apple

16   teams meet on a fairly regular basis to try to determine the

17   right way to optimize the Safari user experience?

18   A. As I recall, when I was at Google that was pretty uncommon.

19   There was a great deal of mistrust between the two teams at

20   that time.

21   Q. And did there come a time when Google raised with Apple

22   issues about the suggestions that Apple was making?

23   A. I think they did this in business status meetings that I

24   did not attend. But the message got back to me, both when I

25   was at Google that Apple was doing some optimal things, and

1   when I was at Apple that Google was unhappy with those

2   suggestions.

3   Q.   When you went over to Apple and you were on the Apple side

4   of these conversations, did you learn about instances where

5   Apple was in fact sort of triggering suggestions that were not

6   resulting in the best user experience?

7   A.   Yeah, I think I very quickly assessed that their

8   implementation of Search, that ███████████████

9   ████████████ that we talked about this morning was over-

10   triggering and providing very poor user experience.

11   Q.   Did Google and Apple work together while you were at Apple

12   to try to optimize for a better user experience?

13   A.   No, we did not work directly together on it.

14   Q.   Did you have discussions that led Apple to try to optimize

15   for a better user experience?

16   A.   I did not. I was aware that the business discussions were

17   expressing that Google thought we could do better for users and

18   better for the revenue agreement. But I wasn't involved in

19   those discussions. I was looking at it purely from the user

20   benefit side.

21   Q.   I believe you said that caused you to make additional

22   investments to improve Apple's search technologies?

23   A.   Yeah, we made significant investments in what we described

24   this morning as ███████████████, and we actually had launched

25   a small number of features that were providing a poor user

1   experience.

2   MR. SCHMIDTLEIN: That's all I have for this portion,

3   Your Honor.

4   THE COURT: Do you have an estimate for how long this

5   examination will take?

6   MR. SCHMIDTLEIN: Probably an hour.

7   THE COURT: And then, Mr. Dintzer, I understand

8   there's still some questions in open session that you wish to

9   ask?

10   MR. DINTZER: I want ahead and asked them, Your

11   Honor, just to move things along, make it more manageable.

12   Three minutes of questions, so we just went ahead. We have no

13   further questions except for reserving. We have no further

14   questions.

15   THE COURT: All right. Why don't we just -- it would

16   help me out if we shorten the lunch break to 45 minutes, to get

17   to my afternoon sessions. So if -- it's 12:30 now. We'll

18   resume at 1:15.

19   We'll see everybody at 1:15. Thank you, everyone.

20   MR. SCHMIDTLEIN: Thank you, Your Honor.

21   THE COURT: Does anybody -- are we not then

22   anticipating any open court questioning of Mr. Giannandrea for

23   the rest of the day?

24   MR. SCHMIDTLEIN: Um --

25   THE COURT: I guess there was some yesterday.

1   MR. SCHMIDTLEIN: There's a segment that I can back

2   load to the back or do it right at the front, whichever you

3   prefer. But I have a small -- a relatively small segment.

4   THE COURT: Let's do this it way: We'll complete

5   your closed examination, the redirect, whatever it may be in

6   closed, and then we'll re-open and we can finish up. So it may

7   be a little bit.

8   Thank you, everyone.

9   (Recess.)

10   THE COURT: Mr. Schmidtlein, we're ready when you

11   are.

12   MR. SCHMIDTLEIN: Your Honor, if I may approach.

13   I've got a binder of documents for the witness.

14   BY MR. SCHMIDTLEIN:

15   Q. Good afternoon, Mr. Giannandrea.

16   This morning you were asked some questions by

17   plaintiff's counsel about some meetings that you were involved

18   in with representatives from Microsoft in 2018 to assess the

19   Bing search engine. Do you recall that?

20   A. I do.

21   Q. Did Mr. Cook personally ask you to get involved in

22   evaluating Microsoft's Bing search engine?

23   A. Yes. In a manner, yeah.

24   Q. And what were the circumstances that led to this engagement

25   with Microsoft about Bing?

1   A.   My understanding was that Mr. Cook had met the CEO of

2   Microsoft at an event earlier in the summer, and that

3   precipitated a series of discussions about whether or not we

4   should be doing more with Bing.

5   Q.   Did Microsoft reach out and propose this engagement to

6   Apple or did Apple reach out to Microsoft and propose this

7   engagement?

8   A.   I think the former.

9   Q.   And in 2018, at the time that this engagement with

10   Microsoft occurred, was Apple at that point evaluating the

11   Safari agreement with Google and trying to decide whether or

12   not to renew the agreement with Google?

13   A.   I'm not aware of that, at the time.

14   Q.   Did you understand that at that time in 2018, that the

15   purpose of this evaluation was that Microsoft had made

16   overtures to Apple about selling Bing to Apple?

17   A.   I wouldn't characterize it as an evaluation. I would say

18   that there was an open discussion about whether we could do

19   more together, and that included, my understanding was,

20   potentially the option to acquire Bing from Microsoft.

21   Q.   Okay. And you had had a great deal of experience in

22   evaluating search engines as of 2018?

23   A.   Of course.

24   Q.   How many search engine quality tests had you reviewed as of

25   2018 in your career?

1   A.   Too many to count.

2   Q.   Are you aware of anyone at Apple who has more experience in

3   the operation of a general search engine than you?

4   A.   No, probably not.

5   Q.   Are you aware of anyone at Apple who has more expertise in

6   evaluating search engine quality than you?

7   A.   Other than the individuals who do the work, no.

8   Q.   Now, we've heard reference to another one of your

9   colleagues at Apple today, An Adrian -- is it Perica, or

10   Perica?

11   A.   Perica.

12   Q.   Perica. Okay. Who is he?

13   A.   He is the head of, I would describe, business development

14   and mergers and acquisitions at Apple.

15   Q.   Does Mr. Perica have any background in search engine

16   development?

17   A.   No, he does not.

18   Q.   Or how to evaluate the quality of a search engine?

19   A.   No, that wouldn't be part of his job.

20   Q.   What role did he play in the evaluation of Bing in 2018?

21   A.   Evaluation of Bing itself or the exploration of potential

22   business opportunities?

23   Q.   The conversations that you were having with Microsoft in

24   2018, what role did he have?

25   A.   I would say he was facilitating those conversations.

1   Q. And did you work closely with Mr. Perica on the analyses of

2   the Bing business at that time?

3   A. I had many conversations with him, mostly in a technical

4   capacity.

5   Q. I think we looked at, earlier today, an email that you sent

6   him with sort of a primer about search engines; is that right?

7   A. Yes. After our first meeting with the Bing people, I felt

8   it important to educate him about some of the relevant aspects

9   of search engines.

10   Q. And did you attend multiple meetings with Mr. Perica and

11   executives from Microsoft in 2018?

12   A. Probably two, maybe three.

13   Q. Okay. Do you recall when your first meeting with Microsoft

14   was in 2018?

15   A. I don't recall precisely. I think it was maybe August or

16   September.

17   Q. Okay. If you would look in the binder I handed you to

18   DX371.

19   THE COURT: Mr. Cavanaugh, can I ask you for a favor?

20   Do you mind just turning those pages around? The doodles are a

21   little distracting.

22   MR. DINTZER: I apologize, Your Honor.

23   THE COURT: Thanks. Appreciate it.

24   I'm sorry. What was the exhibit number?

25   MR. SCHMIDTLEIN: We were looking at 371, DX371, Your

1   Honor.

2   BY MR. SCHMIDTLEIN:

3   Q. Now, is this an email exchange between yourself and

4   Mr. Perica?

5   A. Yes, it is.

6   Q. And this is in late August of 2018; is that right?

7   A. Yes.

8   Q. And in the first email there in time, time sequence,

9   Mr. Perica writes to you, "John, for Wednesday 10 a.m.

10   Microsoft product search meeting, are you bringing anyone from

11   Siri?" Do you see that?

12   A. I do.

13   Q. And this email was written on Tuesday, August the 28th,

14   2018; is that right?

15   A. Looks like it.

16   Q. And based on your review of this, does this suggest to you

17   that you had a meeting scheduled for the very next day with

18   Microsoft?

19   A. Yeah, I think this was the first Microsoft-Bing meeting.

20   Q. Okay. Great. If you look down towards the bottom there,

21   Mr. Perica lists several individuals from Microsoft; is that

22   right?

23   A. Yes.

24   Q. And one of them is a Kevin Scott, referred to as your

25   neighbor. Did you know Mr. Scott?

1   A. Yes.

2   Q. How did you know Mr. Scott?

3   A. Mr. Scott worked at Google for a time.

4   Q. And do you know what part of Google's business he worked

5   in?

6   A. He was part of an acquisition of a company called AdMob,

7   which was in the advertising side of the business.

8   Q. Okay. And then at the bottom of Mr. Perica's email he

9   says, "John thinks they have two hours of talking content, so

10   probably three hours if we ask questions. He and I will try to

11   steal away for an hour to discuss business model while you get

12   into more technical parts."

13   What was the business model he was referring to there?

14   A. Well, his counterpart from Microsoft was Jon Tinter, who

15   had a similar role as Adrian in business development and M and

16   A. So I assumed they were going to talk about potential

17   scenarios for working together, if we wanted to do that.

18   Q. Okay. And the first sentence there, he says, "I just spoke

19   to Jon Tinter from Microsoft. He's bringing four people, but

20   only he knows of the larger conversation." What is that

21   referring to?

22   A. I think it assumes that Jon had signaled to Adrian that

23   potentially Microsoft was interested in selling Bing.

24   Q. This was a bit of a secret, even amongst his colleagues at

25   Microsoft?

1   A.   It would have to be because it's hard to operate something

2   if you know you're about to be sold.

3   Q.   Okay. And you say at the top, you respond to him, at the

4   end of your email, you said, "Great that Kevin will be there.

5   He and I get along famously and he used to work at Google on

6   ads."

7   And did you believe that having Kevin involved would

8   facilitate a more open and frank conversation?

9   A.   Yes. I was looking forward to talking to him about it.

10   Q.   Okay. And do you recall what was discussed at that --

11   MR. SCHMIDTLEIN: And let me pause there, Your Honor.

12   I would move into evidence DX371. I believe we have a business

13   record declaration on this from Apple.

14   MR. DINTZER: No objection, Your Honor.

15   THE COURT: 371 will be admitted.

16   BY MR. SCHMIDTLEIN:

17   Q.   Do you recall what was discussed at this first meeting in

18   August 2018?

19   A.   Yeah, they spent the majority of the time catching us up on

20   the current state of Bing as they saw it, describing their

21   basic metrics and telling us -- representing to us that they

22   thought they were making good progress.

23   Q.   And did you have -- do you recall what observations, if

24   any, you had after the meeting about Microsoft's commitment to

25   Bing?

1   A.   I would say I had gone into this meeting being skeptical

2   that they were going to be dramatically better than the other

3   option. But, I think I represented in some other email that

4   they were fairly open kimono, which in business means they were

5   quite honest and blunt with us about where they saw their own

6   weaknesses and strengths.

7   Q.   Okay. If you would turn in your binder to a document that

8   has been numbered UPX241.

9   MR. SCHMIDTLEIN: I don't believe this is in evidence

10   yet, but it's on plaintiff's exhibit list, so I'd offer it,

11   Your Honor.

12   THE COURT: Okay. UPX241, Mr. Dintzer, any

13   objection?

14   MR. DINTZER: No objection, Your Honor.

15   THE COURT: Okay. 241 will be admitted.

16   BY MR. SCHMIDTLEIN:

17   Q.   And if you'd just take a look at that. Is this an email

18   exchange between yourself and Mr. Perica on August 29th, 2018?

19   A.   On the evening of the 29th, yes.

20   Q.   And this is an email exchange right after the meeting that

21   we've just been talking about?

22   A.   Yeah, later in the day.

23   Q.   And is this a summary of high-level observations that you

24   had coming out of the meeting?

25   A.   Yeah, that's a fair way to characterize it.

1 Q. So the first one, looking there about third paragraph from

2 the top, you say, "Number one, their traffic is small,

3 ████████ a month, versus us at ████████ a week and Google at

4 ████████ a day. This is presumably because they are nowhere

5 on mobile. We have ████████ weekly actives." Do you see

6 that?

7 A. I do.

8 Q. What was the significance of that observation?

9 A. Well, I was surprised by the size of their traffic on

10 desktop and mobile. It was smaller than I was expecting.

11 Q. The second one that you listed there is, "They're investing

12 a lot more in search than we are. They implied greater than

13 1,000 people." Why was that a significant observation?

14 A. Because at the time I was a relatively new employee at

15 Apple and ██

16 ██.

17 Q. Okay. And do you recall, you had left Google in 2018. How

18 many people did Google have working on Search in -- roughly, in

19 2018?

20 A. It's hard to calculate because there's so many other parts

21 of Google that are necessary for Search to work, particularly

22 in the infrastructure teams. But on Search alone, probably

23 about 6,000 people.

24 Q. How many -- when you left Google as the head of Search, how

25 many people directly or sort of indirectly reported up to you?

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 1    A.   About 8,000 people.

 2    Q.   The third observation you made there was, "They are not

 3    launched in most of the countries I think we care about."  Why

 4    was that an observation that you put in your email to

 5    Mr. Perica?

 6    A.   One of the things, one of the opinions I held at the time

 7    was that ███████████████████████████████████████████████████████

 8    ████████████████████████████████████████████████████

 9    ███████████████████████████.   So I was advocating for more

10    investment, and so I was noting that Bing was not particularly

11    any further forward in that regard.

12    Q.   And then the fourth one you list there is, "If they need

13    to," quote, "████████████████████████████████████  to get

14    close to the current economics, we would need to be really sure

15    that it's strategic for both of us.   ████████████████████████

16    ████████████████████████████████████████████████████████████████

17    ███████████"   What did you mean by that?

18    A.   Well, it was my recollection in the meeting that Jon Tinter

19    had suggested that they would be very flexible with revenue

20    share -- referred here to as traffic acquisition cost -- and

21    they might be willing to, in principle, share ████████t of the

22    revenue with us.  And what that told me was that that meant

23    that their -- the value of their ad sales was much worse than

24    Google's.  The so-called RPM rate for an ad was clearly much

25    worse with Bing.  They didn't tell us what it was, but it was
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1   clearly much worse than Google's, if they were willing to offer

2   us ███████ market share -- I mean, sorry, revenue share.

3   THE COURT: The RPM rate again, please?

4   THE WITNESS: RPM was revenue per thousand queries.

5   It's basically how much you pay to place an ad in a search

6   engine or in a display ad network.

7   BY MR. SCHMIDTLEIN:

8   Q. Is there a relationship between RPM and the quality of your

9   search ads technology?

10   A. Yes. And the quality of your search results as well, if

11   you're talking about search ads, yes.

12   Q. Can you explain or elaborate?

13   A. I think there's a lot of confusion and conflation between

14   search ads, which are the ads that are displayed beside search

15   results in a search result page and the larger advertising

16   ecosystem, so-called display ads and remarketing ads. So when

17   people talk about ads following you around the internet or

18   being creepy or privacy invasive, they're usually talking about

19   display ads and not search ads.

20   Q. You then go on in Number 4 to say, "BTW" -- which I assume

21   is by the way -- "it's not so much about the scale of the

22   advertiser network, they said ███ versus ad sense █, most of

23   these advertisers churn out quickly. All the dollars is in the

24   top █ to █." Do you see that?

25   A. I do.

1 Q. And what were you trying to convey there?

2 A. Well, I'm not an advertising expert, but my understanding

3 was that most of the money made from search advertising was to

4 do with the quality of your targeting technology and the

5 quality and size of your sales force. So clearly they were

6 performing much worse than Google was, so that was a concern.

7 Q. And when you say most of these advertisers churn out

8 quickly, what do you mean there?

9 A. Well, when you're talking about, like, a million

10 advertisers, a lot of these are small businesses and they

11 experiment by spending a few thousands dollars on ads and

12 unless they get very good conversion, they very quickly stop

13 doing that because it's not cost effective for them. So

14 there's a lot of churn in all advertising markets on the

15 internet.

16   THE COURT: And, I'm sorry, that's what you then

17 meant by the fact that most of the money is in the top 10- to

18 20,000 advertisements?

19   THE WITNESS: That's correct. Those are advertisers

20 like Toyota or Amazon.com.

21 BY MR. SCHMIDTLEIN:

22 Q. Now, after the August meeting, did you and your colleagues

23 at Apple consider the information you had received and begin

24 your own, sort of, independent assessments or analyses about

25 whether there might be potential avenues for some sort of

1 either acquisition or relationship with Microsoft?

2 A.   Yes.   I think we had a series of meetings in response to

3 this initial meeting with Microsoft to talk about advertising

4 generally and what Apple's strategy was there.   We did have

5 products in the advertising space.   And also to continue this

6 thread, which obviously we had an obligation to get back to

7 them and either ask them for more information or tell them we

8 weren't interested.

9 Q.   And at the time -- I think you may have given some

10 testimony yesterday to the judge about advertising in the ap

11 store.   At this time, did Apple have a search advertising

12 business akin to what Google's advertising business was or what

13 Bing's advertising business was?

14 A.   No, we did not, but we had some people who thought that we

15 should be thinking harder about it.

16 Q.   If you would turn in your binder to DX740.

17   THE COURT: I'm sorry, Mr. Schmidtlein.   If I could

18 just -- would it be accurate to say Apple does not have a

19 comparable search advertising business today?

20   THE WITNESS: Yes.   It does not.

21 BY MR. SCHMIDTLEIN:

22 Q.   Now, DX740 is an email exchange involving yourself -- is it

23 Kevan Parekh?

24 A.   Kevan.

25 Q.   Kevan Parekh.   K-E-V-A-N, P-A-R-E-K-H.

1   THE COURT: And the exhibit again, Mr. Schmidtlein?

2   MR. SCHMIDTLEIN: This is DX740.

3   THE COURT: Okay.

4   BY MR. SCHMIDTLEIN:

5   Q. And this is an email exchange that is kicked off by

6   Mr. Parekh's email, and then Mr. Perica responds and then you

7   respond as well; is that right?

8   A. That's right.

9   MR. SCHMIDTLEIN: Your Honor, I would move into

10   evidence DX740.

11   MR. DINTZER: Your Honor, this is a new document on

12   Google's exhibit list, I believe, and so we've not seen it.

13   And so I think the first thing that they need to do is move to

14   have it added to their exhibit list, not to have --

15   MR. SCHMIDTLEIN: We sent it to you at least a day or

16   two ago.

17   MR. DINTZER: Okay. This is the first time I'm

18   seeing it. It hasn't trickled up to me. So I'll accept his

19   representations, counsel's representations as true, of course.

20   We don't have any problem with it. To the extent that --

21   MR. SCHMIDTLEIN: If they want to reserve --

22   MR. DINTZER: We'll reserve and deal with it

23   afterwards.

24   MR. SCHMIDTLEIN: That's fine.

25   THE COURT: Okay.

1   BY MR. SCHMIDTLEIN:

2   Q. Now, Mr. Giannandrea, am I correct that this email string

3   is kicked off by Mr. Perica forwarding a wired news article?

4   A. It looks like it, yes.

5   Q. And the title of that article was, "I used only Bing for

6   three months. Here's what I found and what I didn't;" is that

7   right?

8   A. That's what it says.

9   Q. Okay. And then, at the top of this chain you respond,

10   saying, "That's a nice article. Sums up Bing's problems,

11   trying to be a portal, not linking out to the web when it

12   thinks it has a vertical experience -- video, recipes,

13   et cetera -- and just further behind the curve on freshness and

14   Spam quality. It's what you would expect from a much smaller

15   investment with a differentiate in verticals thesis."

16   Did I read that correctly?

17   A. Yes.

18   Q. What were you trying to convey to your colleagues with that

19   email?

20   A. It's hard to tell from the email here, but probably Kevan

21   had found this article and sent it to Adrian, trying to inform

22   him about the business proposition that was being discussed

23   around that time in late 2018. And I kind of read the article

24   and gave my technical opinion about why I thought the

25   journalist had found Bing to be unsatisfactory in that article.

1   Q.   This notion of vertical thesis, can you describe what you

2   were referring to there?

3   A.   Yes.   So, Microsoft had been quite public from the

4   beginning of the creation of Bing that they needed to

5   differentiate somehow from Google.   And so one of the ways in

6   which they wanted to do that was by using the structure data

7   and user interface, what we were describing earlier as

8   presentation, to try and make a better user experience, which

9   was their forte as a software company.

10   So they had been very active about that.   And I think

11   I could find some examples where Bing today does a better

12   structure data experience than Google.

13   Q.   The visual presentation?

14   A.   The visual presentation of structured information.   Like

15   what I'm describing here is verticals, so like recipes and

16   sports scores and college admissions, things like that.

17   Q.   Did you believe that Microsoft's vertical strategy was

18   producing better quality search results than Google's search

19   results?

20   A.   No.   I think it was a credible strategy, but it required

21   that you also had best-in-class search results to be making

22   these richer representations at all.

23   Q.   And in the tradeoff -- or, actually, strike that.   Between

24   the visual, or sort of the vertical thesis and the search

25   quality thesis, which did you think was more important for

1   providing a good user experience?

2   A. Well, I had been fairly involved, in my tenure at Google,

3   in trying to get them to do more of this kind of thing. But I

4   definitely think it's more important that you have accurate

5   results first.

6   Q. If you'll turn in your binder to UPX242. I believe this

7   was a -- 242 is in evidence and I believe was shown by counsel

8   to you earlier.

9   And this is an email exchange after another meeting

10   between Microsoft and Apple?

11   A. Yes, this looks like a second meeting that we had with

12   them.

13   Q. Okay. And Mr. Perica is posing the question to you in the

14   first email, "After Thursday's session, what's your gut on this

15   situation? Could Microsoft and us catch up or is the gap much

16   larger in the user space than appears on paper?" That's the

17   question he's posing, correct?

18   A. Yes.

19   Q. And you wrote back, "I appreciated the radical

20   transparency. █████████████████████████████████████

21   ██

22   Let's stop there. What did you mean by that?

23   A. Well, they had represented to us in the first meeting that

24   they knew they were behind in international coverage, and I

25   referred to that in my previous email. We asked them about

1   that and they, in the second presentation, showed us a detailed

2   presentation of an investment plan that would -- they believed

3   would get them to parity in those languages, and it was

4   quite -- I mean, my comment here about radical transparency was

5   quite striking, that they gave us a detailed presentation of

6   what they were not doing, presumably to motivate us to say, Hey

7   if we invested in this together, we could do these things. But

8   they had a specific cost breakdown and proposal for how they

9   would close the gap in French and Japanese, to use the examples

10   we were looking at earlier.

11   Q. You then go on and say, "███████████████████████████

12   ████" -- I assume that's head count?

13   A. Yes.

14   Q. ███████████████████████████████

15   ████████████

16   ██

17   ████████

18   "Not yet."

19   What were you conveying there?

20   A. Well, at this point I had started to conclude that we

21   shouldn't do anything specific around Bing unless we had a

22   theory for how we would make a better experience for users.

23   Q. And certainly as of November 2018 you didn't think that

24   doing any sort of either acquisition or joint venture or

25   business arrangement with Microsoft would necessarily result in

1   a better search engine than Google's?

2   A.   Yeah, I said, Is it possible that we could build a parity

3   product? Yes, it's theoretically possible, but I didn't see a

4   path to a better search engine for Apple's users at that time.

5   Q.   You then -- if you skip down a paragraph, you say, "I've

6   been living on Bing for the last few days, mostly it works

7   fine." And then you describe the long-tail query involving the

8   Eurythmics that we talked about earlier today.

9   Is "mostly working fine" the standard that Apple aspires

10   to?

11   A.   No. Of course not.

12   Q.   Is "mostly working fine" an acceptable standard for Apple

13   when selecting a default search engine?

14   A.   No. We wanted the best search engine for our users.

15   Q.   If you'll turn in your binder to UPX797.

16   MR. SCHMIDTLEIN: And this is a document that is in

17   evidence, I believe, Your Honor.

18   BY MR. SCHMIDTLEIN:

19   Q.   Can you -- do you recognize this document, sir?

20   A.   I do.

21   Q.   And is this an email that Microsoft sent you in advance of

22   the November meeting that we were just talking about?

23   A.   I don't know the exact time. It could have been in advance

24   of that meeting or it could have been shortly thereafter. But

25   it's the presentation I was referring to in my previous answer.

1   Q.   I think the opening sentence from -- Mr. Tinter is the

2   author of this email; correct?

3   A.   Yes.

4   Q.   And he is sort of Mr. Perica's opposite at Microsoft?

5   A.   For this topic, yes.

6   Q.   Okay. He says, "Thanks again for the time next week." Do

7   you think that's a typo, that he meant to say last week?

8   A.   We could look at the timestamps. I'm not entirely sure.

9   Q.   Okay. But the attachment to the email that is entitled

10   Bing International Investment, that's the document that you

11   were -- the radical transparency that you were referring to

12   before?

13   A.   That's correct.

14   Q.   Okay. And did Microsoft indicate to you that they were in

15   fact going to execute on this Bing international investment?

16   A.   No. In fact, they told us they were not going to at that

17   time.

18   Q.   And was the purpose of this to try to persuade Apple to

19   give them the funds to make this sort of investment?

20   A.   Well, in the context of the larger conversation, one of the

21   options, one of the four options we looked at was a joint

22   venture where Apple would have presumably provided some

23   resources and they would have done some of these projects.

24   Q.

25

1 prior emails?

2 A. Yes. I think their goal here was to show us that with more

3 investment, they could close the gap. Our take away, my take

4 away from it was they clearly aren't committed to doing this

5 and that's a problem.

6 Q. Did you think that Microsoft didn't have the resources to

7 make these sort of investments on their own?

8 A. ██

9 ██.

10 Q. Now, you were shown earlier today UPX460. If you would

11 turn to that in your binder?

12 A. Four six -- 460?

13 Q. Yes, 460.

14 A. Okay.

15 Q. Do you recognize this document? I think we looked at this

16 earlier today.

17 A. Yes.

18 Q. Is this the -- is this the -- sort of the analysis document

19 that Apple put together in advance of a team meeting about the

20 Bing business opportunity?

21 A. This is Adrian giving an agenda and summary of the

22 presentation that was to be given to Tim Cook the next day.

23 Q. And did you attend that presentation?

24 A. I did not.

25 Q. Okay. And why didn't you attend it?

1   A. I was traveling, recruiting.

2   Q. Okay. And were portions of the slide deck that was

3   incorporated here -- were there slides that were incorporated

4   into this that were in fact Microsoft Bing slides that had been

5   provided to Apple in some of the prior meetings?

6   A. Quite a few of them, yes.

7   Q. And the slides that were showing assessments of search

8   quality, were those slides that Microsoft had provided to you?

9   A. Yes, they were.

10   Q. This was, I believe you referred to -- earlier today I

11   think you referred to as Microsoft grading their own homework?

12   A. Well, at this time we had not done any work to assess

13   Bing's quality versus Google's, so we were taking their best

14   representations and showing them as part of this argument. And

15   we clearly labeled those slides as source Microsoft.

16   Q. And did you learn about the outcome of this meeting from

17   any of your colleagues?

18   A. Almost certainly I had conversations afterwards, but I

19   don't actually know there was an outcome of this particular

20   meeting.

21   Q. Okay. Do you recall whether, subsequent to this time, you

22   communicated, yourself, directly to Mr. Cook about your own

23   observations about whether or not Apple should move forward

24   with any sort of a business relationship with Microsoft on

25   Bing?

1   A.   Yes.   I expected that we would have subsequent meetings,

2   once everybody had digested this content, to discuss the pros

3   and cons of proceeding.   But I was somewhat worried that I

4   wasn't able to attend this meeting and, sort of, give my

5   skeptical view, and so I wrote an email to Mr. Cook.

6   Q.   If you look in your binder at what has been marked as

7   DX374.

8   Are you there?

9   A.   I am.   Sorry.   Yes.

10   Q.   Is this a December 10, 2018 email that you wrote to Tim

11   Cook about your views of the Bing analysis that had been going

12   on?

13   A.   Yes, it is.

14   MR. SCHMIDTLEIN: Your Honor, we move into evidence

15   DX374.

16   THE COURT: All right.

17   MR. DINTZER: No objection, Your Honor.

18   THE COURT: Okay.   374 is admitted.

19   BY MR. SCHMIDTLEIN:

20   Q.   Now, you observe, at the top of the email, "Sorry I was not

21   in person for the various meetings on Thursday."   These are the

22   meetings we were just talking about; is that right?

23   A.   That's correct.

24   Q.   You then go on in the next paragraph, "I have been closely

25   involved in preparing the deck that Adrian and Steve

1 presented." That's the last exhibit we were just looking at?

2 A. Yes, it is.

3 Q. ███

4 ██

5 ██

6 ██

7 ██████████████████

8 A. █████████

9 Q. ███

10 A. ███████████

11 Q. ██

12 ██

13 ██

14 ███

15 ██

16 ██

17 ████████████████████████████████

18 A. Yes. It was my opinion that if you were going to make a

19 multibillion dollar investment, you would need to have some

20 business justification for it.

21 Q. And I think as we talked about, at that time Apple did not

22 have a search advertising business at all, did it?

23 A. We did not and do not.

24 Q. And you do not today?

25 A. No.

```
1    Q.  If you turn to the next page.  ████████████████

2    █████████████████████████████████████████████████

3    █████████████████████████████████████████████████

4    █████████████████████████████████████████████████

5    ███████████████████████

6          ████████████████████████████████████

7    A.  ████████████████████████████████████████████

8    ███████████████████████████████████████████

9    █████████████████████████████████████████████████

10   ███████████████████████
```

11   Q. And I believe, as you've testified previously -- did

12   anything in Google's agreement with Apple, with regard to the

13   Safari browser, did that limit in any way Apple's ability to

14   make these Safari suggestions or Siri suggestions?

15   A. No.

16   MR. DINTZER: Objection, Your Honor. Calls for a

17   legal conclusion.

18   THE COURT: He can testify as to his understanding.

19   He's not providing a legal opinion.

20   You can answer, sir.

21   A. I didn't believe there was any limit to what we could do

22   with respect to these suggestions. And I think I wrote here,

23   "I think it's fixable and I'll work on it."

24   BY MR. SCHMIDTLEIN:

25   Q. If you'll turn in your binder to DX376.

1   Now, did you have an understanding that there was a

2   meeting scheduled between Mr. Cook and Mr. Nadella to sort of

3   bring to a close the conversations that Microsoft and Apple

4   were having about a potential business partnership or

5   relationship with Bing?

6   A.   At this time, yes, I was in that meeting.

7   Q.   Okay. You were in the meeting with Mr. Nadella?

8   A.   Yes.

9   Q.   Okay. And DX376 is an email exchange that you had with

10 Mr. Cook and others on the eve of the meeting with Mr. Nadella?

11 A.   Yes.

12   UNIDENTIFIED SPEAKER: Your Honor, I think it's the

13 morning of.

14   MR. SCHMIDTLEIN: The morning of.

15   Your Honor, we move into evidence DX376.

16   MR. DINTZER: No objection, Your Honor.

17   THE COURT: Admitted.

18 BY MR. SCHMIDTLEIN:

19 Q.   The beginning of this email is an email from Mr. Cook to a

20 group of executives; is that right?

21 A.   Right.

22 Q.   Phil Schiller. Who was Phil Schiller?

23 A.   Phil Schiller was the head of worldwide marketing at that

24 time.

25 Q.   Eddy Cue. Who was Mr. Cue at this time?

1   A.   Mr. Cue was in charge of Apple service's businesses,

2   including the ISA.

3   Q.   We've heard about Mr. Perica, who is also included here. I

4   believe you've also made reference to Mr. Federighi. What was

5   his position at this time?

6   A.   He was the head of software.

7   Q.   And did that include the Safari browser?

8   A.   Correct.

9   Q.   And then who is Kate Adams?

10   A.   Kate Adams is the general counsel for Apple.

11   Q.   A very, very senior collection of executives at Apple; is

12   that fair?

13   A.   That's a fair assessment.

14   Q.   And Mr. Cook writes, "My thoughts going into the meeting

15   today" -- the meeting he's referring to is the meeting with

16   Mr. Nadella and Microsoft; is that right?

17   A.   Specifically to discuss Bing, yes.

18   Q.   Okay. "███████████████████████████████████████

19   ██

20   ██

21   ████████████████████████

22   A.   ██████

23   Q.   ██

24   ████████████████████████

25   A.   ████████████████████████

1   Q. He then says, "████████████████████████

2   ████████████████████████████." Did you agree with

3   that?

4   A. I did.

5   Q. Are you aware of anybody at Apple who disagreed with that?

6   A. Explicitly disagreed, no. But there was definitely people

7   who thought that it was an interesting idea.

8   Q. The next bullet point there, "████████████████

9   ████████████████████████████████████

10   ████████████████████████████████████

11   ████████████████████████████████████

12   ████████████████████████."

13   Did you agree with that?

14   A. I did. And I think generally this option would have been a

15   so-called joint venture option and nobody really liked that

16   idea.

17   Q. Now, what did you understand Mr. Cook saying there, when

18   he -- when he talks about "██████████████████

19   ████████████████████████████████████

20   ████████████████"?

21   A. Well, I mean, I don't know exactly what he meant, but

22   clearly they were -- Microsoft was willing to sell Bing, which

23   you wouldn't do if it was a strategic asset. And the lack of

24   investment I think referred to this international gap that we

25   just discussed.

1 Q. Now, you were also asked some questions this morning by

2 Mr. Dintzer about a -- the 2021 evaluation that Apple did of

3 Bing and that your group was involved in. Do you recall that?

4 A. I do.

5 Q. And was one of the reasons -- well, was one of the reasons

6 that you did that, was to evaluate whether Bing had made

7 progress from the 2018 conversations that you'd had with them,

8 you know, up -- in this interim time period?

9 A. My recollection is that after we -- after this meeting

10 where we declined to proceed with Bing, that there were ongoing

11 meetings between Mr. Perica and Mr. Tinter to kind of touch

12 base and keep having conversations about how is Bing doing.

13 And sometime in 2020, during the pandemic, Bing hired the

14 ex-head of Yendex, who I considered technically a very

15 competent search leader.

16   And so the conversation came back around, not

17 necessarily at Tim Cook's level, but that Bing was better now

18 and that we should keep looking at it and keep the conversation

19 going. And I recall a conversation in the fall of 2020

20 where -- I don't fully recall -- Mr. Tinter and Mikhail and

21 some other people made some strong claims that they had

22 continued to invest in Bing and it was better. And so I

23 suggested that we should do our own evaluation.

24 Q. Did your evaluation support the claims that Microsoft was

25 making?

1   A.   When we finally did the evaluation and looked at it, it

2   definitely did not.

3   Q.   After you did the evaluation, which I believe was reflected

4   in Exhibit 260, did you have a different opinion as to whether

5   Apple should switch the default search engine on Safari from

6   Google to Bing?

7   A.   I had a definitive opinion that we should not.

8   Q.   And why did you hold that opinion?

9   A.   Because in the 2018 conversations we were relying on

10   Microsoft's representations about the relative merits of Bing

11   versus Google. And given that data, we decided not to proceed.

12   ██

13   ██

14   ██

15   ██

16   ████████████████████████████████████.

17   Q.   You were asked some questions about the evaluation that

18   showed comparisons between Google and Microsoft on desktop. Do

19   you remember that?

20   A.   I do.

21   Q.   And what was your recollection of how the evaluation played

22   out on desktop?

23   A.   For this very rudimentary evaluation that we did, it could

24   be characterized as a tie on desktop for relevance, but a loss

25   everywhere else.

1   Q. And did you believe that switching the default search

2   engine from Google to Bing on Mac computers, which is a desktop

3   computer, did you think that would be the best thing for

4   Apple's users?

5   A. Well, regardless of whether or not they were equivalent, I

6   believe that most users would switch back and so we would be

7   making the default something they didn't want.

8   Q. Did you have an understanding -- or, in your years in the

9   industry, did you learn about Google's popularity on the

10   Windows desktop?

11   MR. DINTZER: Objection, Your Honor. Foundation.

12   MR. SCHMIDTLEIN: He's the head of Google Search. I

13   think I asked him the question: Did he have an understanding?

14   THE COURT: And then, just if you would ask him what

15   the basis is, and then he can answer it, depending on the

16   foundation for the answer.

17   Go ahead, sir.

18   A. When I was in charge of Google Search, we did extensive

19   evaluations and studies of what people did on Windows desktops,

20   yes.

21   BY MR. SCHMIDTLEIN:

22   Q. And did you have an understanding as to whether Google was

23   preloaded or had a default position on most Windows desktop

24   computers?

25   A. No, I did not.

1   Q. And did you have an understanding as to whether or not

2   Microsoft had engaged in a series of actions to actually make

3   it difficult for users to switch defaults to Google on the

4   Windows desktop?

5   A. That would have been my opinion at the time. We did a lot

6   of things to try and combat that behavior.

7   Q. Notwithstanding all of that, what did you learn about the

8   popularity of Google on Windows?

9   A. That users preferred it. One example being that most

10   people on Windows use the Chrome web browser. I think the

11   market share number is 60-plus percent.

12   Q. Was the Chrome web browser a default browser on Windows

13   devices?

14   A. It's not even preinstalled.

15   Q. Since you have been at Apple, are you aware of any effort

16   by Yahoo! to try to persuade Apple to make Yahoo! the default

17   search engine on Safari?

18   A. I'm not aware of any conversation, no.

19   Q. Now, are you familiar with DuckDuckGo?

20   A. I am.

21   Q. To your knowledge, has Apple considered using DuckDuckGo as

22   the default search engine on the Safari browser?

23   A. Not to my knowledge, no.

24   Q. Why not?

25   A. Because DuckDuckGo is, I would describe, a veneer on top of

1   other search engines, specifically Yahoo! and Bing.

2   Q.   What do you mean by "a veneer on top of"?

3   A.   Well, in order to be a functional search engine, they have

4   to get most of the results from a much larger search engine.

5   Q.   To your mind, does DuckDuckGo operate its own independent

6   general search engine?

7   A.   Yes, to a degree. They do have some search engine

8   technology that they built.

9   Q.   Do you view DuckDuckGo as a superior search engine to

10   Google?

11   A.   I do not, no.

12   Q.   Are you aware of anybody with an Apple who believes that

13   DuckDuckGo offers a superior search engine than Google?

14   A.   It's a subjective question. Objectively, no.

15   Q.   To your mind, has DuckDuckGo invested in the infrastructure

16   necessary to run a world class search engine?

17   MR. DINTZER: Objection, Your Honor. Foundation.

18   THE COURT: He's asking his opinion. He's the head

19   of search of Google formerly. I think he's qualified to answer

20   the question.

21   Go ahead, sir.

22   THE WITNESS: I think the fact that DuckDuckGo uses

23   the API from other search engines, like Yahoo!, which are built

24   on top of Bing, and Bing itself tells you that, no, they

25   haven't built a general purpose search engine.

1   BY MR. SCHMIDTLEIN:

2   Q. If you'll turn to your binder, to DX375.

3   A. 375.

4   MR. DINTZER: Counsel, I'm not sure I have a DX375.

5   THE COURT: Doesn't seem to be in the binder.

6   BY MR. SCHMIDTLEIN:

7   Q. Mr. Giannandrea, is DX375 an email that you wrote to Darin

8   Adler on or around December 11th, 2018?

9   A. It appears to be.

10   MR. SCHMIDTLEIN: Your Honor, we offer DX375 into

11   evidence.

12   MR. DINTZER: No objection, Your Honor.

13   BY MR. SCHMIDTLEIN:

14   Q. Now, the subject of this email is DuckDuckGo; correct?

15   A. Correct.

16   Q. And you write to Mr. -- first of all, who is Mr. Adler?

17   A. Darin Adler is the VP in charge of several software

18   products, including Safari at Apple.

19   Q. And you write, "Hey, Darin, I noticed in the re-plan the

20   desire to do more with DuckDuckGo, which seemed deferred."

21   What were you saying there?

22   A. In the planning process for yearly operating system

23   releases, teams propose things and then prioritization happens.

24   And, so, there was a proposal floated to do more with

25   DuckDuckGo and Safari and then "seems deferred" means that it

1   was tabled for the moment.

2   Q. And then you write to him, "Just so you know, DuckDuckGo is

3   actually just the Bing API ████████████████████████████████

4   ███

5   ███

6   ██

7   ████████████████████████████████████"

8   What were you telling Mr. Adler in this email?

9   A. Well, in the conversations we'd had in late 2018 with Bing,

10   the subject of DuckDuckGo had come up because I knew there were

11   some people at Apple who were excited about the privacy claims

12   that they were making, specifically, that when they sent

13   searches to Bing, they hid the IPA addresses of the original

14   browser. ██████████████████████████████████████

15   ███

16   ██

17   ████████████████████████████████.

18   Q. Was it your view, in December of 2018, that it would be a

19   mistake for Apple to make DuckDuckGo the default search engine,

20   either for public browsing or private browsing?

21   A. I don't recall what the proposal was that brought this to

22   my attention, but I was trying to explain to Darin that if we

23   give DuckDuckGo a lot more traffic, it could actually backfire.

24   Q. If you'll look in your binder for DX377.

25   A. Sorry, what's the number?

1   Q. 377.

2   A. Okay.

3   Q. Now, this is an email dated February 9, 2019. So just a

4   few months later than the last email we looked at. It's

5   another -- well, it's an email back and forth, it looks to me,

6   between you and Mr. Adler; is that correct?

7   A. That's correct.

8   MR. SCHMIDTLEIN: Your Honor, we move DX377 into

9   evidence.

10   MR. DINTZER: No objection, Your Honor.

11   THE COURT: It will be admitted.

12   BY MR. SCHMIDTLEIN:

13   Q. Now, try to -- I'm going to try to work through this one,

14   because this looks like a back and forth between you and

15   Mr. Adler in the midst of a single email. At the top, it

16   appears that you are writing, "Hi, Darin, answers in line.

17   Happy to discuss live, if it's helpful;" is that right?

18   A. Yeah, I think the paragraphs alternate between myself and

19   Darin.

20   Q. Okay. So the next paragraph of the document, is this

21   Mr. Adler's language?

22   A. Yes.

23   Q. Okay. And he's explaining in that paragraph a plan to

24   allow users who download and make use of the single search app

25   one of the options, they would then get a prompt about changing

1   this -- it says the Safari search engine. Is what he's saying

2   there that if somebody downloads a search engine application

3   from the Apple App Store, they would get a prompt to change the

4   default in Safari to that search application?

5   A.   I understood that that was what was being proposed, yes.

6   Q.   And your response to that -- am I correct that your

7   response is the next paragraph?

8   A.   Yes, that looks right.

9   Q.   And you say, "I think this is broadly fine. Downside is if

10   someone downloads the app for a reason other than search. Say

11   someone wanted the Google left, or home music experience, we're

12   going to lose queries" -- I assume you meant lose queries

13   there -- "the user didn't intend to change the default for."

14   Can you explain what you were saying there?

15   A.   Well, if the proposal was that downloading and using an app

16   from a search engine was a strong enough signal to prompt

17   people to change their default, there would be some people who

18   would be left out because they, A, it was not their intention

19   to change their default and they just downloaded the app for

20   some reason. Because the app versions of Search contained loss

21   of functionality, not just Search itself.

22   Q.   Do you know whether Apple went ahead and adopted this

23   functionality?

24   A.   No, I do not. I do not believe we built this.

25   Q.   Okay. Now the next one is -- I think he then says, "It

1   would have no effect unless someone went to the app store,

2   downloaded a search app, then made use of it. Then it's a

3   one-time prompt for each user, only if they aren't already

4   using the cert provider." Is that his language or yours?

5   A. That's his language.

6   Q. Okay. Then you said, "This is actually a non-trivial

7   population, as much as 20 percent." What are you referring to

8   there?

9   A. I'm referring to the users I was referring to in the second

10   paragraph -- or the third paragraph, which is people who didn't

11   actually intend to change their default, so they would be

12   getting a prompt that they didn't really want.

13   Q. It then goes and has a discussion about DuckDuckGo. Do you

14   see that?

15   A. I do.

16   Q. And it's a -- the title there, or the bolded section,

17   "DuckDuckGo recommendation for private browsing." Do you see

18   that?

19   A. I do.

20   Q. And am I correct that the first paragraph here is

21   Mr. Adler's language?

22   A. Yes, I believe it is.

23   Q. And he writes, "Users who turn on private browsing for the

24   first time will receive a DuckDuckGo recommendation. The

25   search engine setting can then be different for a given use for

1   both normal browsing and private browsing." So that was his --

2   that was a proposal he was making?

3   A.   That sounds like a proposal he was making, yes.

4   Q.   And what was your response?

5   A.   Well, I wrote here that it's probably a bad idea. The

6   motivating factor for setting DuckDuckGo as the default for

7   private browsing was an assumption on Mr. Adler's part that it

8   was actually going to be more private.

9   Q.   And you believed -- I believe you wrote here, "This is

10 probably a bad idea;" is that right?

11 A.   Yes. That was my opinion.

12 Q.   And then you go on and you explain a number of the same

13 issues that you had raised in the last email that we looked at;

14 is that right?

15 A.   ██

16 ██

17 ██.

18 Q.   Did you think that DuckDuckGo adequately explained and

19 disclosed its privacy policy or its privacy implementation to

20 users?

21   MR. DINTZER: Objection, Your Honor. Foundation.

22   MR. SCHMIDTLEIN: Asking his opinion.

23   MR. DINTZER: And then relevancy, Your Honor.

24   THE COURT: Well, I think the question is, is he --

25 just ask him whether he's looked into the issue and then

1   whether he's formed an opinion on it and, if so, what the

2   opinion would be.

3   BY MR. SCHMIDTLEIN:

4   Q. Have you evaluated DuckDuckGo's public privacy claims?

5   A. Yes, from time to time I've read it in detail. And my

6   opinion is that their marketing about privacy is somewhat

7   incongruent with the details. They're in small print.

8   Q. And how so?

9   A. Well, because in order to make money in DuckDuckGo, they

10   use Bing's advertising ecosystem, and in order to do that they

11   have to allow Bing to do IP address tracking.

12   Q. And do you have an understanding that DuckDuckGo gets both

13   search results and search ads from Bing?

14   A. And some other providers as well. They do affiliate ads, I

15   believe.

16   Q. And even if DuckDuckGo is not providing certain specific

17   user information to Bing, do you have an understanding as to

18   whether Bing's back end and the search algorithms and

19   everything that's built on that, that that is in part built on

20   getting user data from lots of other people?

21   A. Yeah, I don't know the details of Bing's advertising back

22   end, but I definitely would be suspicious that that might be

23   going on.

24   Q. If Apple had -- if Apple was going to make a decision to

25   change the default search engine for either public or private

1   browsing, do you believe you would have been consulted about

2   that?

3   A.   I think I was being consulted here in this email message.

4   If this was an affirmative decision that Darin and his boss

5   wanted to make, I would probably insist on doing a lot more due

6   diligence with DuckDuckGo.

7   Q.   And to your knowledge, has Apple internally ever decided

8   that it would be better for Apple's users to make DuckDuckGo

9   the default search engine for any experience, public or

10   private, for Safari?

11   A.   Not to my knowledge, no.

12   Q.   Mr. Giannandrea, you were asked some questions by counsel

13   about the role of scale and click and query data with respect

14   to search quality. Do you believe that someone could build a

15   search engine that could compete with Google with a fraction of

16   Google's search query and click data?

17   A.   I think it's increasingly technically possible, yes.

18   Q.   Sitting here today, do you believe it's possible for a

19   general search engine, other than Google, to achieve scale on

20   mobile in a manner that could compete with Google?

21   A.   I think it would need to be better for users to get users

22   to switch, just like they do to Chrome on desktop. I think

23   it's possible to build that product.

24   Q.   Has the use of machine learning technologies made click and

25   query data scale more or less important in building a high

1   quality search engine?

2   A.   I think clearly less important.

3   Q.   And have the development and use of AI technologies made

4   click and query data more or less important in building a high

5   quality search engine?

6   A.   I would say neither. I think if you have that data you

7   will use it in building your machine learning algorithms.

8   Q.   In other words, the training or the -- strike that.

9   The large language models that are being used today, are

10   those being trained on click and query data or other, sort of,

11   publicly available data?

12   A.   My understanding would be both. I would think you would

13   use everything available to you.

14   Q.   What implications do these improvements in natural language

15   learning have on the ability to build a high quality search

16   engine?

17   A.   Well, I think, as you can see from both Bing and Google

18   racing to put these things in their products, they think it's

19   very important.

20   Q.   Based on your experience at Google, does search query scale

21   guarantee that a search engine will be commercially successful?

22   A.   Guarantee, no.

23   Q.   Now, when you were at Google and you were involved in

24   Search, did you view or did Google view vertical search

25   providers like an Amazon or a Yelp or a Trip Adviser to be

1   completing with Google for search queries?

2   A. Not for general search queries, but for overall information

3   intents, yes.

4   Q. And did Google view specialized vertical search providers

5   like an Amazon or a Yelp or an Expedia, for example, in many

6   cases to be more significant competitors to them then, let's

7   says, a Bing or a DuckDuckGo?

8   A. For the queries that they specialized in, like travel

9   queries or commerce queries, yes, more attention was paid to

10   those vertical search providers than to DuckDuckGo.

11   Q. Did Google, during your years there, did Google make

12   significant investments and innovations to allow Google to

13   compete more effectively against those specialized vertical

14   search providers?

15   A. Yes, very much so. Particularly in shopping and travel.

16   MR. SCHMIDTLEIN: I have no further questions, Your

17   Honor.

18   THE COURT: Okay. Redirect in closed session?

19   MR. DINTZER: Your Honor, I'm going to be covering

20   basically -- I'm going to be walking through some of what

21   counsel has walked through. So I think it's no more openable

22   than what he just covered.

23   THE COURT: I'm not following. I'm sorry.

24   MR. DINTZER: I think we need to stay where we are,

25   Your Honor, just because I'm going to be covering the same

1   subjects.

2   THE COURT: Okay. That's what I was asking.

3   MR. DINTZER: I apologize if I was unclear.

4   REDIRECT EXAMINATION

5   BY MR. DINTZER:

6   Q. Sir, I'd just like to start with talking about Chrome.

7   Okay? So, did you work on Chrome when you were at Google?

8   A. I managed the Chrome team for a time, yes.

9   Q. And Chrome was -- Mr. Pichai worked on the Chrome team; is

10   that right?

11   A. I think he got it started, right.

12   Q. And Chrome was a really good browser, right?

13   A. I think it's a good browser, yes.

14   Q. Is it fair -- some might say it was, at least early on, the

15   best browser; is that right?

16   A. I think the other browser companies would disagree with

17   that.

18   Q. But you worked for Google, so let me ask you your opinion.

19   A. I thought it was an excellent engineering team, but there

20   was lots of criticisms of some of the design decisions they

21   made.

22   Q. Okay. Do you know that -- I mean, you've been on all sorts

23   of properties online. Sometimes you get these pop-ups that say

24   "Download Chrome." Have you ever seen one of those?

25   A. I have.

1   Q. Do you know if they say that Google is the default search

2   engine? I'm asking. So when they suggest somebody download

3   Chrome, do you know if they specifically tell the person that

4   if you do, you're going to get Google as the download?

5   A. Not in the pop-ups I've seen, no.

6   Q. And those pop-ups -- I mean, I see it most when I'm on

7   Google properties, right? When you're talking YouTube, Gmail,

8   that's when they show up, right?

9   A. Me, too.

10   Q. Having those properties that get a lot of traffic means

11   that Google has a specific opportunity to show Chrome pop-ups

12   and try to get people to click on them, right?

13   A. That's correct, yes.

14   Q. And this is a technical question that you may or may not

15   know, but when you get to the pop-up that says download the

16   Chrome browser, do you recognize that the one that's bolded and

17   it looks like the default is the "yes" and the one that says

18   "no," like I'm happy where I am, says the "no"?

19   A. I haven't look at the designs in detail.

20   Q. Okay. Have you ever seen research that specifically says

21   what percentage of the people who are downloading the Chrome

22   Bowser are doing it specific and only because they want Google

23   as their search?

24   A. I have not seen any research for this.

25   Q. So as you sit here now, when you say people download --

1   people download the Chrome Browser, you're not saying that they

2   necessarily, every single one of those people, did it for the

3   purpose of getting Google, right? That's not part of your

4   testimony?

5   A. No. I was saying that the market share of the use of the

6   browser seems high.

7   Q. Okay. Now, let's see. So let's go to UPX797, which I

8   think Google's counsel talked to you about. And I'm not going

9   to go through the document. I just have a question. You

10   testified, I believe, that Microsoft asked Apple for its

11   investment?

12   A. 797 in the binder?

13   Q. Just tell me if you've got that there, sir.

14   THE COURT: Is this in the Google binder?

15   MR. DINTZER: It's in the Google binder. I

16   apologize. I -- it's in the Google binder.

17   A. Okay. I got it.

18   BY MR. DINTZER:

19   Q. And, so, you talked about how Microsoft asked for Apple's

20   investment, is that right? with this -- when you were talking

21   about this document with counsel?

22   A. No. I said this was them showing us a quality investment

23   plan that my understanding was they had not funded.

24   Q. Right. Maybe I got it wrong. I thought you said that they

25   had asked if Apple would help them invest. Maybe I got that

1   wrong?

2   A.   No.   One of the four strategic considerations that we've

3   reviewed is that we might do a joint venture with Microsoft on

4   Bing.   As part of that they were proposing that maybe this work

5   could get funded and that would close the international gap.

6   Q.   And my question is, is when Microsoft came to Apple, they

7   were asking for Apple's queries, right?   I mean, they had

8   different possible ways that you could slice the cake and how

9   Apple might participate, but one of the things that Microsoft

10   wanted was queries from Apple, right?

11   A.   I'm not sure that they ever asked for queries.   I think the

12   considerations were how do we get Bing to be good enough that

13   we would consider switching it in some markets.

14   Q.   One of the things that Microsoft told you, I think you said

15   that they were -- that they were radical transparency.   I think

16   we saw that term in the document.   That they felt they needed

17   more mobile queries, right?   That's what they said to you?

18   A.   This email is about investments required.

19   Q.   So let's stop.   I'm just going to ask you: Microsoft told

20   Apple that Microsoft believed they needed more mobile queries,

21   didn't they?

22   A.   I don't recall specifically.   It very likely came up in the

23   conversation, yes.

24   Q.   You talked about ads, and I think you said you're not an ad

25   expert.   And I'm going to kind of hold you to that, but I did

1   want to ask one question, and maybe you know the answer.

2   The use of data helps in the monetization of ads, right?

3   A. For sure.

4   Q. And I say "data," I mean "user data," right?

5   A. Yes. Knowing what ads people want and which ones they

6   click on is essential.

7   Q. It helps monetize, right?

8   A. It does.

9   Q. Now we're going to take a turn to a little bit more

10   technical. You know what Nav Boost is, right?

11   A. I do.

12   Q. And you know what QVST is, right?

13   A. I do.

14   Q. The Court has heard about them probably more than it wants

15   to, so I promise we're not going to go technical. But, those

16   are trained on user data, right?

17   MR. SCHMIDTLEIN: I don't know how this relates to my

18   examination.

19   MR. DINTZER: I promise I'll connect it back in two

20   questions.

21   THE COURT: Okay.

22   BY MR. DINTZER:

23   Q. Those are trained on user data, right?

24   A. They were mostly when I was at Google, yes.

25   Q. Do you know if they were trained ██████████?

1   A.   I don't recall the specifics.

2   Q.   Okay. They were trained frequently, right?

3   A.   They were fresh signals, yes.

4   Q.   You used the word "fresh," I think, and that's what

5   connects it back up. The reason they were trained so

6   frequently was to make sure of freshness, right?

7   A.   Yes, freshness is important in a search engine.

8   Q.   And it's important in the -- in the elements of -- I mean,

9   and you talked about that with counsel, they're important in

10   training these elements, helped make sure that they gave fresh

11   rankings, that the responses were correct, right?

12   A.   Yes. Freshness is about latency, not quantity.

13   Q.   Freshness, it also makes sure that the -- I mean,

14   there's -- let me put it this way: Part of the challenge of

15   freshness is making sure that whatever gets surfaced to the top

16   of the -- in the ranking algorithm is consistent with what

17   people right now are interested in, right?

18   A.   I mean, generally true. A great example of freshness would

19   be somebody famous dies, you kind of need to know that within

20   seconds.

21   Q.   Okay. No further questions on that, sir.

22   MR. DINTZER: I think the only thing I have left,

23   Your Honor, is that -- a couple of housekeeping things. We

24   want to mark as UPXD008 the sometimes incoherent scrawlings

25   that I put on the chart. Hopefully some of them will become

1   useful later. And then move to admit that. And I promise

2   we'll just take pictures of it and --

3   THE COURT: I don't know we've been actually

4   admitting demonstratives.

5   MR. DINTZER: Well, we've been admitting some. But

6   if the Court would prefer not to admit them, then we'll just

7   note that they've been marked as UPXD008.

8   THE COURT: Let's just mark it.

9   MR. DINTZER: We would like to admit UPX494, which I

10   did use and I forgot to formulate it.

11   THE COURT: Okay. Any objection to 494?

12   MR. DINTZER: And if the witness has a flight, we

13   can -- I mean, it's quick, but we're welcome to excuse him.

14   MR. SCHMIDTLEIN: No objection.

15   THE COURT: All right. 494 will be admitted.

16   All right. Does that mean -- any further

17   questioning?

18   MR. DINTZER: No, Your Honor. We thank the witness

19   for his testimony and we're done.

20   MR. SCHMIDTLEIN: I have actually no further

21   questions.

22   THE COURT: Okay. All right. Mr. Giannandrea, thank

23   you very much for your time and testimony, sir.

24   THE WITNESS: Thank you.

25   THE COURT: Safe travels home.

1   (Open session:)

2   THE COURT: Okay, everyone. So, come to the end of

3   the day in terms of evidence. Just in terms of scheduling, we

4   are not sitting on Monday. So we'll resume on Tuesday.

5   And let me just ask where plaintiffs see themselves

6   in the time horizon of their case, now that we're a couple of

7   weeks in.

8   MR. DINTZER: Thank you, Your Honor. So two things

9   about that. One is, is that we wanted to -- and I want to make

10   sure I don't forget. The Court asked when certain people that

11   might attract interest are going to appear. Mr. Cue is

12   scheduled to be first thing Tuesday morning. I don't want to

13   forget that.

14   The second thing is, is that we're looking at the --

15   at where we are, and our thinking is, is that over the weekend

16   we'll sharpen pencils and we'll take a look at what we've

17   covered and what doesn't need to be covered a second time, of

18   course, and report back to the Court early next week about,

19   sort of, how -- you know, how far we need to extend and where

20   we're at.

21   THE COURT: Okay. I just thought I would ask. Okay.

22   Then in terms of -- have you made any progress on the exhibits

23   issue that we discussed last night? I thought you all were

24   going to send something over to Google last evening.

25   MR. DINTZER: Mr. Dahlquist will address that.

1   MR. DAHLQUIST: Yes, Your Honor. David Dahlquist.

2   We sent a proposal over late last night. I haven't

3   heard back. I assume we'll hear something soon, unless you

4   have something now.

5   MR. SCHMIDTLEIN: No. We got a draft motion late

6   last night. It did not correspond with what we had been orally

7   promised in terms of the process. I have provided it to my

8   client. We will provide a response with our -- probably some

9   counterproposal to them later today.

10   THE COURT: Okay.

11   MR. DAHLQUIST: I'll just note, Your Honor, we took

12   your guidance in following some of the instruction in the

13   January 6 proceedings. We followed a previous order that you

14   had issued there and that informed something here. So we will

15   talk this weekend and I'll report back to you on Tuesday.

16   THE COURT: Okay. I guess bottom line is, I would

17   like to get this resolved. So, I know we're not sitting

18   Monday, and not everyone is off on Monday. So can we get this

19   resolved by Monday? And if there is a dispute remaining, I'll

20   resolve it. Because I would like to get an order posted on

21   Monday.

22   MR. DAHLQUIST: Understood. Thank you, Your Honor.

23   THE COURT: All right. Okay. So, I think -- does

24   that leave anything else? Are there any other housekeeping --

25   there's the exhibit, but other than that?

1   (No response.)

2   THE COURT: Okay. So at least my, sort of, last

3   housekeeping matter concerns Exhibit 38. I had left open the

4   issue overnight, as well as the transcript pages. Look, the

5   bottom line is I'm going to admit 38 in an unredacted manner,

6   as well as make the transcript portions public.

7   I think, balancing the *Hubbard* factors, there is a

8   need for public access, there's certainly interest in public

9   access of the document, it's now been admitted into evidence.

10   We can have conversations about its probative value, but,

11   nevertheless, I did find that it was admissible under the Rules

12   of Evidence. So it is now part of the evidentiary record.

13   Although there's been no prior access to the

14   information and Google has objected, at the end of the day, I

15   think, given the importance of the public access, and the

16   request for redactions is largely one to avoid some degree of

17   embarrassment, which I understand, but ultimately doesn't

18   contain information that is either a trade secret or otherwise

19   confidential financial information or the like, which is sort

20   of the rule that we've been generally applying here.

21   I'm going to admit it free of redactions. I'll

22   unseal the portions of the in-camera testimony that -- under

23   seal testimony with respect to that exhibit. And, so,

24   balancing all of those factors, I think that's where I'm going

25   to come out. Okay.

1   MR. DINTZER: Thank you, Your Honor.

2   THE COURT: Is there anything else to discuss before

3   we break?

4   MR. DINTZER: Just a housekeeping -- kind of

5   housekeeping matter, Your Honor. We've discussed with the

6   defendants that we will exchange with them what we believe are

7   the non-pushed entered exhibits, to make sure we're all on the

8   same page. And if we could ask for, sort of, a check-in with

9   the clerk, so that we all are on the same page, if that would

10   work?

11   THE COURT: Sure. Just confirm with J.C. when it is

12   appropriate and we can figure that out.

13   MR. DINTZER: Excellent. That's all we have, Your

14   Honor.

15   THE COURT: All right. Anything from the states?

16   No?

17   MR. CAVANAUGH: No, Your Honor.

18   THE COURT: Anything from Google?

19   MR. SCHMIDTLEIN: No, Your Honor.

20   THE COURT: Thank you, everyone. Have a nice

21   weekend. We'll see you Tuesday.

22   Please do not wait for me.

23   *   *   *

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1   CERTIFICATE OF OFFICIAL COURT REPORTER

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3   I, JANICE DICKMAN, do hereby certify that the above and

4   foregoing constitutes a true and accurate transcript of my

5   stenographic notes and is a full, true and complete transcript

6   of the proceedings to the best of my ability.

7   Dated this 23rd day of September, 2023

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10   _____

11   Janice E. Dickman, CRR, CMR, CCR
                      Official Court Reporter
12   Room 6523
                      333 Constitution Avenue, N.W.
13   Washington, D.C. 20001

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