

EXHIBIT EE

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

MATTHEW CAMPBELL,) Case No.
MICHAEL HURLEY, and) C 13-05996 PJH (MEJ)
DAVID SHADPOUR)
Plaintiffs)
vs.)
FACEBOOK, INC.)
Defendants)

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

Videotaped Deposition of Jennifer Golbeck
Washington, D.C.
December 16, 2015
9:03 a.m.

Reported by: Bonnie L. Russo
Job No. 2196773

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1 you looking at or opining on?

2 A. So I looked at two versions of this
3 guy's -- the fraudulent guy's Web sites -- he
4 had two Web sites -- and basically just said
5 the name of Equity Trust Company didn't appear
6 on those Web sites.

7 Q. When you refer to the Internet
8 archive, is that the same as the Wayback
9 Machine?

10 A. It is.

11 Q. Okay. Is that something you rely
12 upon in -- in your work?

13 A. Pretty -- I use it pretty
14 frequently.

15 Q. Is it pretty -- do you find it to be
16 fairly reliable?

17 A. It's -- yeah, for what it is, right?
18 It's definitely not a complete archive of
19 everything that's out there, but the copies of
20 things that they do have are accurate.

21 And -- and I -- this is, again,
22 totally outside the area of my expertise
23 legally, but I think -- my understanding is
24 that they actually have said that legally it
25 can be assumed as true that, if something was

1 archived on March 1st, that that absolutely was
2 there on March 1st. So it seems reliable to me
3 in that way.

4 Q. Other than the expert reports and
5 testimony we've talked about, is there any
6 other -- are there any other expert reports or
7 testimony that you've ever given?

8 A. No. There are other cases that I've
9 been invited to participate in, especially
10 patent cases, but ones that I've declined.

11 Q. Have you ever served as a
12 nontestifying consultant in a -- in a lawsuit?

13 A. So those --

14 Q. Other than the E. Stephanie and --
15 you'll have to remind me of the name of the
16 other one.

17 A. Yeah. Sherry's Dance Studio, I --

18 Q. Sherry's Dance Studio.

19 A. -- I think --

20 Q. Yeah.

21 A. -- is what that was.

22 Those I would count in there. Other
23 than those, I don't -- I don't think so.

24 Q. If you -- in the instances when
25 you've declined to work in a patent case, why

1 A. Yes.

2 Q. Have you observed people with
3 differing degrees of knowledge -- and here I'm
4 talking about social network users -- regarding
5 sort of the collection and processing of their
6 data by the social network?

7 A. Yeah. There's vastly different
8 understandings.

9 Q. Why do you think that is?

10 A. It's really complicated, you know.
11 It -- and I think it's hard even for people who
12 are trained in that space to -- to really
13 understand what's happening because its
14 relatively opaque.

15 I have been surprised at times on --
16 on what data is made available say to third
17 parties. And I spend all my time learning
18 about that, right?

19 Q. Uh-huh.

20 A. That -- kind of how data gets out.
21 So I say in a lot of these talks, like if I
22 didn't know, like literally no one on earth can
23 be expected to know because it's my full-time
24 job, and I'm one of the experts on it.

25 So, you know, it's complicated. And

1 then there's people with varying degrees of how
2 interested they are in tracking this down --

3 Q. Uh-huh.

4 A. -- right? I think it's analogous to
5 like terms of service, right? I read them.
6 Most people don't. And, you know, that's --
7 that gives you a big difference in what you
8 understand.

9 Q. Would you agree with me that some
10 people understand that, when they are
11 interacting with a -- with a Web site, that
12 there are various electronic processes
13 happening in order to render the site and, you
14 know, basically make the site run, some people
15 are sort of aware of that, and others don't
16 have a clue?

17 MR. RUDOLPH: Objection. Form.
18 Vague. Compound.

19 THE WITNESS: I think that's true,
20 that there's varying levels of understanding
21 that people have on how that works.

22 BY MR. JESSEN:

23 Q. Have you observed differing degrees
24 of consent from users for collection and use of
25 their data?

1 general is -- I find it's much more difficult
2 to use.

3 There are certainly more people with
4 public profiles on Facebook, but it's a lot
5 harder to find them in the way they can be
6 found on Twitter or Pinterest, for example.

7 Q. Okay. So tell me briefly what the
8 thesis was of the -- of the TED talk.

9 A. Oh. I've never thought of it that
10 way.

11 Q. Or maybe not -- "thesis" is the
12 wrong word, but the -- the point you were
13 making.

14 A. I think -- you know, talking about
15 what people know and what they don't, hardly
16 anyone who hasn't seen my TED talk knows that
17 these kind of person- -- private personal
18 attributes can be inferred about them from what
19 they're doing online.

20 And the purpose of the TED talk was
21 really to kind of explain the vary powerful
22 things that we can do with this technology and
23 get people thinking about the implications.

24 Q. And one of the things, I think --
25 you know, forgive me if I'm getting this

1 wrong -- but you discuss with homophily?

2 A. Yes. You got it right.

3 Q. What is -- what -- you may have to
4 give the court reporter the spelling of that
5 one.

6 But what is -- what is that exactly?

7 A. Yeah. So homophily,
8 H-O-M-O-P-H-I-L-Y, is a concept from sociology
9 actually that basically birds of a feather flock
10 together, that we tend to be friends with
11 people who share our traits more than people
12 randomly pulled from the general population
13 would share our traits.

14 So you're right; you're friends with
15 rich people. If you're poorly educated, your
16 friends tend to be poorly educated. It applies
17 to race, sexual orientation, income, education,
18 kind of across the board.

19 Not that all of your friends are
20 like that, but your traits are more common in
21 your friends than they are in the general
22 population.

23 Q. And does this -- is this sort of --
24 is this the phenomenon that allows a researcher
25 like yourself to look at seemingly random data,

1 like what kind of fries you like, and then make
2 some sort of -- and I'm phrasing this really
3 badly -- but draw an inference about it based
4 upon attributes that you wouldn't think would
5 correlate with that?

6 A. Sometimes.

7 Q. Not a good question.

8 A. So in the curly fries example in the
9 talk, which you were just talking about --

10 Q. Yeah.

11 A. -- you know, I kind of hypothesize
12 that homophily was one of the things that play
13 there. Sometimes it's used very directly in
14 those algorithms --

15 Q. Uh-huh.

16 A. -- where they're relying on that
17 basically as the entirety. I think it plays a
18 role in a lot of those algorithms, though
19 sometimes it's much less explicit.

20 Q. Is homophily at all relevant to the
21 organization of social networks?

22 A. In -- so are you asking could a
23 social network organize around that principle,
24 or does it emerge in social networks?

25 Q. I guess more the latter.

1 A. I think it's true. I mean the
2 principle says these are the kinds of people we
3 tend to choose as friends, right? If I'm a
4 liberal, I will tend to choose other liberal
5 people as my friends.

6 And so, in that case, it can
7 influence how a social network forms. If I
8 find out some guy is a ranging racist, I may
9 unfriend him on Facebook, and that affects the
10 network.

11 So that -- that could be a way
12 homophily is considered, its play in
13 influencing the structure of the network.

14 Q. Earlier you talked about social
15 graph.

16 Remind me what you meant by that?

17 A. Social graph is just a -- a term to
18 refer to people and their connections to one
19 another.

20 Q. And generally how is the data in a
21 social graph organized?

22 A. Like from a computing perspective or
23 from a mathematical perspective?

24 Q. I think a computing perspective.

25 A. So there it really depends. So from

1 the mathematical perspective, it tends to be
2 represented in a graph structure, which is a
3 mathematical concept --

4 Q. Okay.

5 A. -- and to tease into their
6 connections to one another.

7 Q. Uh-huh.

8 A. Com- -- computationally, you could
9 store that in a relational database. There's
10 also graph-based databases that -- that are
11 network-based instead of relational. So it
12 really depends on the implementation.

13 Q. Uh-huh. Do you know if Facebook has
14 a social graph?

15 A. I mean they certainly have people
16 connected to other people.

17 Q. Uh-huh. And is that something -- do
18 you know if there are other things that go into
19 their social graph?

20 A. Well, I would just want to be
21 careful about terminology here, because
22 Facebook has a thing that they call "the social
23 graph" --

24 Q. Right.

25 A. -- which is different from the kind

1 of generic way I'm using the term.

2 Q. Okay.

3 A. So Facebook's certainly has more
4 information about people and their connections
5 than simply the fact that Alice and Bob are
6 connected as friends. They have more data than
7 that.

8 Q. What kind of -- what kind of data do
9 you -- I mean when you said Facebook has a --
10 has something they call "the social graph,"
11 what is your understanding of what that is in
12 the context of Facebook?

13 A. So Facebook's social graph, my
14 understanding is it's how they refer to
15 basically the way that they store all of the
16 kind of network-structured data within their
17 systems.

18 So it would include -- I believe it
19 includes the profile information about people,
20 all the data about people, information about
21 their connections to other people.

22 But I think the social graph --
23 Facebook social graph also includes data about
24 connections between other entities within
25 Facebook. So, for example, pages that I

1 like --

2 Q. Right.

3 A. -- would be part of Facebook's
4 social graph.

5 Q. Do you think the Facebook social
6 graph is valuable?

7 MR. RUDOLPH: Objection. Vague.

8 THE WITNESS: What do you mean by
9 "valuable"?

10 BY MR. JESSEN:

11 Q. Well, does it have monetary value?

12 MR. RUDOLPH: Objection. Lacks
13 foundation.

14 THE WITNESS: I've --

15 MR. RUDOLPH: Vague.

16 THE WITNESS: I've got like no
17 expertise in the monetary value of these
18 things.

19 BY MR. JESSEN:

20 Q. Understood.

21 A. So I'm not quite sure how to answer.

22 Q. Okay. Just more like in the
23 abstract, talking about social graphs, like --
24 well, I guess if you were -- strike that.

25 Do you know where the data in

1 Facebook's social graph is stored?

2 MR. RUDOLPH: Objection. Vague.

3 THE WITNESS: What do you mean by
4 "where"?

5 BY MR. JESSEN:

6 Q. Like in a database or a particular
7 computer science structure?

8 A. I know --

9 Q. A system. Sorry.

10 A. Yeah.

11 Q. Go ahead.

12 A. I know they have a system called
13 TAO --

14 Q. Uh-huh.

15 A. -- which I believe stands for "The
16 Objects and Associations," which is one
17 abstraction that they use to store that data.
18 There are databases that back that.

19 Q. What's your understanding of TAO,
20 T-A-O?

21 A. I think I basically just gave you
22 the bulk of it. There's a Facebook engineering
23 blog post that kind of describes TAO, which
24 I've read a number of times.

25 So I have that kind of high-level

1 understanding of the fact that it stores data
2 with that structure that the abstraction
3 presumably allows them to compute with it in a
4 more efficient manner.

5 Q. Is it your understanding that
6 everything stored in TAO is the social graph --
7 the Facebook social graph?

8 A. Do you mean that, if it's not in
9 TAO, it's not part of the social graph?

10 This is a -- it's a hard question to
11 answer because where you draw the line is
12 fuzzy.

13 Q. Okay.

14 A. Right?

15 Q. Okay.

16 A. Yeah.

17 THE VIDEOGRAPHER: I'm sorry. We
18 should probably switch the...

19 MR. JESSEN: Okay. Let's take a
20 break, and we'll let him...

21 THE VIDEOGRAPHER: Off the record at
22 11:13.

23 This is the end of Media Unit No. 1.

24 (A short recess was taken.)

25 THE VIDEOGRAPHER: On the record at

1 11:31.

2 This is the beginning of Media Unit
3 2 in the deposition of Dr. Jennifer Golbeck.

4 BY MR. JESSEN:

5 Q. Dr. Golbeck, are you familiar with
6 object-oriented programming?

7 A. I am.

8 Q. What is that?

9 A. It's a category of programming
10 languages that have the ability and I would say
11 are centered around the ability to create
12 objects.

13 Q. What programming languages are
14 those?

15 A. Oh, I don't think I could list them
16 all.

17 Q. Well, let me --

18 A. Java is a big one.

19 Q. Yeah.

20 A. Cplusplus.

21 Q. What about PHP?

22 A. I would call PHP scripting language,
23 not a object-oriented programming language.

24 Q. What's the difference?

25 A. You probably can create objects in

1 PHP, but it's not kind of the primacy of what
2 the language is built around.

3 Q. Uh-huh. What is the significance of
4 objects in object-oriented programming?

5 A. They're very significant.

6 Q. Okay.

7 A. I'm sorry. I'm not sure exactly
8 what you're asking.

9 Q. Yeah. I mean -- well, what role do
10 they play?

11 A. It's a way of representing data.
12 It's basically a more complex data structure.
13 Object-oriented programming languages have
14 natural built-in support for working with those
15 that would be hard to develop yourself in a
16 non-object-oriented programming language.

17 Q. Would it be possible to create a
18 program in an object-oriented language that
19 does not create objects?

20 A. Depends on the language.

21 Q. What about cplusplus?

22 A. Cplusplus you can do it without
23 creating any objects.

24 Q. Is that common?

25 A. I don't feel like I'm expert enough

1 on all the programming languages out there at
2 this point to be able to say.

3 Q. Okay. What about Java; could you do
4 it with Java?

5 A. Java you have to create a class,
6 which is the representation of an object.

7 Q. Can you use objects with PHP?

8 A. I believe that there is a way that
9 you can use objects in PHP, yes.

10 Q. You've reviewed some of -- and we're
11 going to get into this in more detail, but you
12 reviewed some of the Facebook source code --

13 A. I did.

14 Q. -- as part of your expert report.

15 Would you agree with me that the
16 code you reviewed was written in an
17 object-oriented language?

18 A. So it was written in PHP, and there
19 are objects in it. My hesitation is just that
20 there are some kind of deep computer "sciencey"
21 things going on here that are -- that I just
22 don't know about from like the theory of
23 programming languages perspective.

24 So I agree that it's in PHP. And I
25 agree that there are objects in it.

1 Q. Uh-huh. But you wouldn't consider
2 the PHP code that you reviewed of Facebook to
3 be object-oriented?

4 A. I think it would be fair to call it
5 object-oriented. My hesitation is that I don't
6 know if a programming languages theorist in
7 computer science would say that PHP is an
8 object-oriented programming language. I just
9 don't know.

10 Q. Okay. Would you agree that, in a
11 software that is written in an object-oriented
12 programming language, essentially all data is
13 stored in objects?

14 A. I don't know that I can agree with
15 that. I think it depends on the implementation
16 and how you have it written.

17 Q. Well, would you agree that software
18 written in an object-oriented language
19 typically stores data in objects?

20 A. Probably. I think the reasoning
21 that people might select an object-oriented
22 programming language is to store data in
23 objects.

24 Q. And does that doing -- does that --
25 doing that have certain efficiencies?

1 A. Totally depends on the
2 implementation.

3 Q. Okay. Would you agree that, in
4 object-oriented programming, creating and
5 storing objects from data received is a
6 fundamental aspect of how that type of
7 programming operates?

8 A. Can you just repeat that question,
9 please.

10 Q. Yeah. Sure.
11 Would you agree that, in
12 object-oriented programming, creating and
13 storing objects from data received is a
14 fundamental aspect of how that type of
15 programming operates?

16 MR. RUDOLPH: Objection. Form.

17 THE WITNESS: What do you mean by
18 "data received"?

19 BY MR. JESSEN:

20 Q. Well, what is -- I think you said
21 earlier objects represent things.

22 And so could some of those things be
23 data that the -- that the software is
24 receiving?

25 A. Receiving from just --

1 Q. From the --

2 A. -- anything?

3 Q. Let's say for a user, for example.

4 A. So we started talking about
5 something implemented online.

6 Q. Sure. We can in this --

7 A. I think it wouldn't be uncommon, if
8 you're using an object-oriented programming
9 language, to store data in objects.

10 Q. Okay. Object-oriented programming
11 is a common practice; would you agree with
12 that?

13 A. I think that's fair.

14 Q. Okay. So creating and storing
15 objects is not something unique or unusual in
16 the case of Facebook, is it?

17 MR. RUDOLPH: Objection. Vague.
18 Form.

19 THE WITNESS: Like creating
20 objects -- like an object within the code in --

21 BY MR. JESSEN:

22 Q. Yeah. Using -- you know, for -- for
23 Facebook to create objects which represent
24 things on its Web site, that's not an unusual
25 practice for a Web site, is it?

1 MR. RUDOLPH: Objection. Form.
2 Vague.

3 THE WITNESS: Yeah. So the
4 hesitation that I'm having is that there are
5 ways of storing data in objects, which is not
6 necessarily the same as the objects one would
7 create in a program that's running.

8 And Facebook does both of those
9 things. So if we're talking about
10 object-oriented programming, I don't think
11 there's anything unusual that I've seen in the
12 code about the -- the code and the objects that
13 are created within it to operate on that data.

14 BY MR. JESSEN:

15 Q. And you're talking about the
16 Facebook code that you've reviewed?

17 A. Yes.

18 Q. Okay. Very basic question: What is
19 Facebook?

20 MR. RUDOLPH: Objection. Vague.
21 Overbroad.

22 THE WITNESS: I'd say it's kind of
23 vague. It's a online social networking
24 platform.

25

1 BY MR. JESSEN:

2 Q. And what is your understanding of
3 the service that Facebook provides?

4 A. I think Facebook provides a lot of
5 different services.

6 Q. Such as?

7 A. The ability to create an online
8 profile. The ability to build connections to
9 friends and share posts with them. There's a
10 gaming component of the platform. Farmville,
11 for example. I guess Candy Crush is big there
12 now. I don't play games on Facebook.

13 Obviously they have a messaging
14 functionality. They have a business platform,
15 which is a little bit different than the user
16 maintaining a profile. Businesses can create
17 profiles that people can like, and businesses
18 can distribute information that way.

19 They have an advertising
20 functionality, external social plug-ins. I
21 don't know how much they're still using it, but
22 there's the Facebook Connect kind of Universal
23 log-in functionality.

24 And, you know, there's overlap
25 between some of these, but a lot of them are

1 quite distinct functions centered around having
2 a Facebook account.

3 Q. Okay. And you -- you are -- you are
4 a Facebook user, correct?

5 A. I am.

6 Q. How many Facebook accounts do you
7 have?

8 A. I mean I have one kind of account
9 for myself. I have a professional author page.

10 Q. Sorry. I didn't mean to interrupt
11 you.

12 A. No. Go ahead.

13 Q. The account for -- when you say you
14 have a -- "I have an account for myself," like
15 a personal account.

16 A. Right.

17 Q. Jen Golbeck's?

18 A. It is.

19 Q. Okay. All right. And then you also
20 have a professional account, you said?

21 A. Well, so it's -- it's connected to
22 my personal account, but I have a professional
23 page -- I think it's an author page -- that
24 people can like that I don't have to be friends
25 with.

1 So my personal account is kept very
2 private. That author page is where I do kind
3 of professional public communications. Yeah.

4 Q. Do you know what e-mail addresses
5 you have associated with your Facebook
6 accounts?

7 A. My main -- the account I use is
8 golbeck@gmail.com.

9 How many accounts have I created
10 over time and what e-mails? I don't know. I
11 probably have one associated with my UMD
12 account, my UMD e-mail address. I don't know
13 if I ever log in there. And then there's
14 account for my fictional guy in my
15 investigations book, Malcolm Conroy Smith, who
16 is not an actual person. I'd appreciate it if
17 Facebook doesn't shut his account down or like
18 ask for his passport. He's got accounts all
19 over the place, and I maintain that.

20 Q. Okay.

21 A. He also has his own Gmail account.

22 Q. What was his name, Malcolm Conroy
23 Smith?

24 A. Yes.

25 Q. And tell me what his function is

1 again.

2 A. In my book "Social Media
3 Investigation," I wanted to have a kind of
4 account that people reading the book could go
5 kind of cyber stalk basically.

6 So he posts all kind of stuff on all
7 kinds of social media platforms, same profile
8 picture and user name so they can kind of
9 practice some of the techniques without
10 stalking any real people.

11 Q. Understood.

12 You have -- are you an active Gmail
13 user?

14 A. An active Gmail user?

15 Q. Yeah.

16 A. Yes.

17 Q. You mentioned Gmail.

18 A. Yes.

19 Q. Golbeck@gmail.com.

20 And have you been for a long time?

21 A. I was one of the very first Gmail
22 users.

23 Q. What year would that have been?

24 A. 2003 or '4 maybe. I got an invite
25 from Google when they launched. And, you know,

1 you could invite two other people. And people
2 were selling the invites on E-Bay for hundreds
3 of dollars. It was like very technocool --

4 Q. Okay.

5 A. -- at the time.

6 Q. Nice.

7 Do you also have a Yahoo account?

8 A. Probably, yeah.

9 Q. Is that something you use as well?

10 A. I think the only time I use it is
11 connected to my Flickr account, I think. I
12 definitely don't use Yahoo e-mail, but I
13 probably get spam there. I feel like there's
14 one or two services I use where I occasionally
15 have to log in with that. But Flickr is the
16 only one that I can think of.

17 Q. Are you aware that there have been
18 lawsuits against Google and Yahoo that are
19 comparable to the lawsuit against Facebook?

20 MR. RUDOLPH: Objection. Vague.
21 Lacks foundation.

22 THE WITNESS: I do know about the
23 Gmail one. I didn't know there was one against
24 Yahoo.

25 BY MR. JESSEN:

1 Q. There's also one against Twitter.

2 A. Interesting.

3 Q. That's a newer one.

4 What was your understanding of the
5 lawsuit against Google?

6 A. That -- so my understanding is that
7 there was a class action lawsuit alleging --
8 basically around Google showing targeted ads
9 based on the contents of people's Gmail
10 accounts. That's -- that's how I understood
11 that.

12 Q. Is that something that you
13 understood when you were using -- when you used
14 Gmail, that they actually do, Google?

15 MR. RUDOLPH: I'm going to object to
16 this line of questioning as being beyond the
17 scope of Dr. "Golberg's" expert testimony.

18 You can answer.

19 BY MR. JESSEN:

20 Q. You can answer.

21 A. Okay. Did I understand that Gmail
22 was analyzing the contents of my messages to do
23 advertising?

24 Q. Yes.

25 A. I did.

1 Q. Since 2004 you understood that or...

2 A. Oh. No. I -- I don't know when I
3 first thought about that. But when that
4 lawsuit -- when I read about that lawsuit, I
5 knew that they were doing that.

6 Q. Uh-huh. And did you keep using --
7 you kept using Gmail?

8 A. I did.

9 Q. Did this alleged practices against
10 Google bother you?

11 A. Yeah.

12 MR. RUDOLPH: Objection. Vague.

13 BY MR. JESSEN:

14 Q. So why did you keep -- why did you
15 keep using the -- the Gmail account?

16 A. The -- again, there's a seven-hour
17 answer here. I'll try to keep it short.

18 Yeah. I mean I -- I consider part
19 of my work, you know -- well, not consider.

20 A lot of my work is focused around
21 privacy. And I have a kind of dystopian view
22 of where we're going in terms of privacy in the
23 online space.

24 The problem that I see is that there
25 are not a ton of great alternatives, and we're

1 not given a lot of options, right? So I could
2 switch to another e-mail provider who, even if
3 their terms of service now says they won't do
4 that, they could start doing it later.

5 If I pay for one, which I would
6 absolutely be willing to do, there's no
7 guarantee they're going to stay in business.
8 And that probably was my biggest motivation for
9 sticking with Gmail.

10 I have two Gmail accounts, a
11 professional and a personal one. And like my
12 whole life since 2004 or '5 is in both of
13 those. It would be -- the cost of switching
14 and to potentially having to switch again is
15 higher than my level of "upsetness" with the
16 privacy issues.

17 Q. Understood.

18 So you're willing to trade some of
19 your privacy in return for the convenience of
20 continuing to use your Gmail account.

21 MR. RUDOLPH: Objection.
22 Mischaracterizes prior thyme testimony.

23 THE WITNESS: Yeah. I -- I mean I
24 don't think that's quite right. Like I would
25 love to have the option.

1 BY MR. JESSEN:

2 Q. Right.

3 A. Like I'd pay Gmail for the privacy.
4 If they let me, I would pay lots of services.
5 Like you can go tell Facebook, if they let me
6 pay for my account and didn't show me ads, like
7 I would totally pay them like way more a month
8 than they get on advertising.

9 It's not an option. So I don't know
10 that I'm willing to trade privacy for
11 convenience. I don't see it as that kind of
12 trade-off. But I -- it's true that I was
13 willing to continue using Gmail.

14 Q. Do you use any kind of like ad
15 blocking software?

16 A. I use like ten kinds of ad blocking
17 software.

18 Q. Do -- do they work?

19 A. Yes.

20 Q. So do you actually -- like going to
21 Facebook, do you see ads when you visit
22 Facebook or...

23 A. That's a good question. I don't see
24 the regular Facebook ads that appear on the
25 side. I think I do see some sponsored posts.

1 I think that's right. I think I see some.

2 Q. When did you first sign up for a
3 Facebook account?

4 A. August of 2005, I believe.

5 Q. That was pretty early too.

6 A. Sure was.

7 Q. Why did you do that? Why did you
8 sign up?

9 A. I had accounts on every social
10 network that existed in 2005 except the adults
11 ones.

12 Q. Okay. What -- what -- what prompted
13 you to set up a Facebook account in August of
14 2005?

15 A. So part of my dissertation is --
16 there was a whole chapter on kind of the state
17 of social networks.

18 Q. Uh-huh.

19 A. I had a list of all the social
20 networks that existed. And there's a
21 particular set of features that I was
22 interested in seeing if those had, which were
23 relevant to my work but not really relevant
24 now.

25 So I had accounts on all of those

1 networks first to go in and see if those
2 features were there and also just to kind of be
3 aware of the state of things.

4 It was a -- a new enough phenomenon
5 in 2004, 2005 that there weren't a lot of
6 people who were just experts on what existed.
7 So part of my becoming a doctor was becoming
8 one of those experts.

9 Q. And you've continued to use Facebook
10 to the present day?

11 A. Yes.

12 Q. How -- how often do you use
13 Facebook?

14 A. Every day.

15 Q. Okay. How long every day, on
16 average?

17 A. It's hard to add up because I do a
18 lot of it like at red lights maybe, checking my
19 Facebook account.

20 Q. A very bad practice.

21 A. I know. Probably a couple hours a
22 day. Maybe -- maybe one hour a day total.

23 Q. And how much of that is for your
24 like personal Facebook use as opposed to
25 research you might be doing?

1 A. It's hard for me to draw that line.
2 If I didn't have a professional need to kind of
3 know what's going on, I may have closed my
4 Facebook account.

5 You know, I'm in my 30s. And it's a
6 lot of my friends posting pictures of their
7 babies, which all kind of look the same after a
8 while.

9 So, you know, on one hand it's
10 mostly personal stuff that I'm looking at,
11 things that my friends have posted. I don't
12 post all that much, but occasionally it -- it's
13 for them.

14 At the same time, I -- I -- the
15 reason I have the account, I -- I would say is
16 80 percent professional just so I kind of know
17 the features that are there, know what's going
18 on, know the memes, that kind of thing.

19 Q. You normally access Facebook from a
20 computer or mobile device?

21 A. It's probably half and half. I
22 prefer to use my computer when i have it, but
23 there's a lot of times I'm walking around, use
24 the phone.

25 Q. What browser or browsers do you use

1 to access Facebook?

2 A. On my phone I use Safari pretty much
3 exclusively -- or I use -- actually use the
4 Facebook app. I do sometimes access it with
5 Safari, but I usually use the app. On my
6 computer, primarily through Firefox, though I
7 do use Chrome and Safari on my computer.

8 Q. Do you have JavaScript enabled on
9 all those browsers?

10 A. I do.

11 Q. Has that always been the case?

12 A. I occasionally turn it off, but
13 generally its always enabled.

14 Q. Why do you occasionally turn it off?

15 A. It really slows things down.
16 Sometimes, you know, there will be sites that
17 have scripts that just kind of crank and will
18 -- especially my Firefox because it's very
19 customized. JavaScript will sometimes crash
20 it.

21 Some days, if I'm just feeling
22 particularly privacy paranoid, I'll also turn
23 it off.

24 Q. Why would you turn it off if you're
25 feeling privacy paranoid?

1 A. So a lot of the technology that --
2 for example, key logging technology, as you're
3 typing, what you're typing is being
4 transmitted, is done with a technology called
5 AJAX. And the J in AJAX is for JavaScript. So
6 if you turn JavaScript off, the actions that
7 you're taking on your computer can't be
8 transmitted until you submit them.

9 Q. Have you used the Facebook Messages
10 product?

11 A. The app or just the --

12 Q. Either one. Either -- well, let's
13 first start with the -- the Web site itself.

14 Are you aware of the messaging
15 functionality?

16 A. I do use that on Facebook.

17 Q. How long have you used that feature?

18 A. Probably since it's been there.

19 Q. Do you also do it on the -- in the
20 Facebook app for Messenger app?

21 A. Yeah. Well, you can't send messages
22 in the Facebook app. It has to be in the
23 Messenger app. I won't download the Messenger
24 app for privacy concerns.

25 So if I'm on the mobile and I have

1 to do messaging, I'll do it by accessing
2 Facebook through the browser on my device.

3 Q. Okay. I assume that you have both
4 sent and received messages through the Facebook
5 Messages product.

6 A. That's right.

7 Q. Can you give me an estimate of how
8 many messages you've sent through Facebook
9 Messages product?

10 A. I have no idea. You could probably
11 have them counted for me. I mean I can't even
12 give you an order of magnitude. Like if you
13 told me it was a thousand, I'd believe you. If
14 you told me it was a hundred thousand, I'd
15 believe you too.

16 Q. It sounds like it's a lot.

17 A. There's a few people that I do a lot
18 of -- the equivalent of texting, right, with
19 them through the Messages app.

20 Q. You've also received a lot of
21 messages through Messages product?

22 A. I have.

23 Q. Okay. Can you provide an estimate
24 as to how many Facebook users you've exchanged
25 messages with through the Facebook Messages

1 product?

2 MR. RUDOLPH: Just going to -- I'm
3 going to object to this line of questioning as
4 being beyond the scope of Dr. "Golberg's"
5 expert report -- Golbeck.

6 Sorry.

7 MR. JESSEN: Goldberg's my expert.

8 MS. MAUTE: I've been doing that.

9 THE WITNESS: Yeah.

10 MR. JESSEN: It is kind of funny
11 that they're so close.

12 MR. RUDOLPH: It's going to happen.

13 THE WITNESS: Not the only time it
14 happens to me.

15 Probably 30-ish.

16 BY MR. JESSEN:

17 Q. Okay. Have you sent Facebook
18 Messages containing URLs?

19 A. I have.

20 MR. RUDOLPH: Same objection.

21 BY MR. JESSEN:

22 Q. How many?

23 MR. RUDOLPH: Same objection.

24 THE WITNESS: How many messages?
25

1 BY MR. JESSEN:

2 Q. Well, now I'm focused specifically
3 on messages containing URLs.

4 A. It's very hard for me to gauge. A
5 hundred, a few hundred.

6 Q. Okay. From the time you first
7 started using the Messages product to the
8 current day?

9 A. I think so. I mean it's really hard
10 for me to estimate that.

11 Q. I understand.

12 A. Yeah. But yeah, I mean that's just
13 considering all the time I've used it.

14 Q. Were the messages that you've sent
15 on -- using the Facebook Messages product that
16 contained URLs, were they accompanied by the
17 URL preview?

18 A. Some of them definitely were. I
19 don't know if they all were.

20 Q. We're going to get into this when
21 we -- when we get into your report, but you
22 have a general understanding -- well, when you
23 sent those messages containing preview, you had
24 a general understanding of sort of how the
25 preview had been generated; is that fair to

1 say?

2 A. You know, it depends on what you
3 mean by "how." But I -- I had a general
4 understanding of how the Facebook Open Graph
5 tags worked and that that was feeding the
6 preview.

7 Q. What do you mean by Open Graph tags?

8 A. So Facebook has a ontology, a schema
9 that allows third-party Web site owners to put
10 Meta tags in the head of their HTML
11 documents --

12 Q. Uh-huh.

13 A. -- that have information that
14 Facebook can use to build that preview in
15 Messages or otherwise. They include a title
16 and an image and a description. And there's
17 some other ones.

18 So that's a technology that -- that
19 I was aware of. I have no idea when it was
20 launched, but I remember reading about it when
21 it was launched.

22 And so I understood that -- that
23 that data that was in the third-party sites was
24 what was being displayed as the preview box
25 when I pasted in the URL.

1 Q. Were there ever instances where you
2 pasted in the URL, a preview was generated, and
3 then you X'd out the preview before sending the
4 message?

5 A. Yes.

6 Q. But I gather there were instances
7 when you left the preview in tact --

8 A. Yes.

9 Q. -- before you hit "send."

10 A. Yes.

11 Q. Would it be accurate to say that,
12 during the time you've used the Facebook
13 Messages product, you've also received Facebook
14 Messages containing URLs?

15 A. I would guess that I have. I can't
16 think of any specific instances off the top of
17 my head, but it would surprise me if there
18 weren't any.

19 Q. Okay. You understand that, for a
20 period of time -- well, strike that.

21 For the URLs that you've sent
22 through the Facebook Messages product, do you
23 have an understanding as to how many of
24 those -- the Web sites associated with the URLs
25 had a Like -- Facebook Like button social

1 plug-in on their site?

2 A. Oh. I have absolutely no idea.

3 Sorry.

4 Q. That's okay.

5 And you probably also have no idea,
6 for those Web sites that may have had a Like
7 button social plug-in, whether or not that
8 plug-in had a counter next to it that totaled
9 the number of likes?

10 A. Yeah, I -- I don't know.

11 Q. Okay. I also assume you have no
12 idea that -- whether or not, if you sent a URL
13 in a message -- a Facebook message, that, if
14 the Web site associated that message had a Like
15 button social plug-in, and if the Like button
16 social plug-in had a counter next to it, you
17 can't tell me whether or not your sharing of
18 that URL in a message incremented that counter.

19 Would that be accurate?

20 MR. RUDOLPH: Objection. Compound.
21 And again, this is beyond the scope of her
22 testimony -- expert testimony.

23 THE WITNESS: Knowing what I know
24 from having reviewed all the Facebook code now,
25 I know that it would have gone up. But I

1 didn't observe it going up.

2 BY MR. JESSEN:

3 Q. Is it your understanding that, any
4 time a Facebook user includes an URL in a
5 message, that if the URL -- strike that.

6 Is it -- is it your understanding
7 that, any time a Facebook user includes a URL
8 in a message, and the URL linked to that --
9 sorry -- the Web site linked to that URL has a
10 Like button social plug-in, that every time
11 that URL was sent in a -- in a private message,
12 the counter next to that URL, if it existed,
13 was incremented?

14 MR. RUDOLPH: Objection. Form.

15 THE WITNESS: For that to happen,
16 the URL -- there would have to be a URL preview
17 attachment on the message. So if -- if I had
18 X'd out that attachment, my understanding is
19 that it would not have incremented the Like
20 button; but if the attachment was there and
21 everything operated the way it should, that
22 that Like button would have gone up in the time
23 period that we're talking about here.

24 BY MR. JESSEN:

25 Q. Prior to the end of -- well, at some

1 point in 2010, prior to the end of 2012?

2 Does that sound right to you?

3 We'll in your report in more detail,
4 but...

5 A. So there's a date where Facebook
6 changed the number that was being displayed in
7 that Like counter.

8 Q. Yep.

9 A. Prior to that date, from looking at
10 the code, my understanding is, if there was a
11 private message with a URL preview attachment
12 and everything operated right, once that was
13 sent, the counter would be incremented.

14 Q. And we'll get into more detail on
15 that when we walk through your report.

16 Do you ever let anyone else use your
17 Facebook account?

18 A. No.

19 Q. Has anyone else ever sent a Facebook
20 message on your behalf?

21 A. I hope not. I mean it theoretically
22 could have happened if I walked away from my
23 computer in a meeting or something. But I
24 don't think that's ever happened.

25 Q. When was the last time you sent a

1 message on Facebook -- or through the Facebook
2 Messages product that included the URL?

3 MR. RUDOLPH: Objection again. I
4 mean these questions going to Dr. "Golberg's"
5 personal use of Facebook are beyond the scope
6 of her expert testimony.

7 Golbeck. Sorry.

8 Can you just correct that
9 automatically in the transcript, please.

10 THE WITNESS: Probably last week.

11 BY MR. JESSEN:

12 Q. Do you remember if it had a URL
13 preview attached --

14 A. I --

15 Q. -- to it?

16 A. Well, it did because now I pay
17 really close attention to that, right?

18 Q. Okay.

19 A. This case is kind of in the
20 forefront of my mind right now.

21 Q. Right.

22 So preview -- last week you -- you
23 included the URL in a message, a preview was
24 generated, you left the preview intact and sent
25 the message.

1 A. I did.

2 Q. Okay. And is it -- is it safe to
3 say that you've probably done that quite a bit
4 this year, sent messages with URLs that had
5 previews on them?

6 A. I think that's fair.

7 Q. Earlier we talked a little bit about
8 the first time you reached out to plaintiffs'
9 counsel.

10 A. Yes.

11 Q. Which I think you said was
12 approximately November 2014. You referenced a
13 New York Times article that you read.

14 Was that the first time you became
15 aware of this lawsuit?

16 A. It was.

17 Q. Okay. What is your understanding of
18 what the plaintiffs in this case are alleging
19 that Facebook did wrong?

20 A. On like a high level?

21 Q. Sure.

22 A. That Facebook intercepted the
23 private messages and did things with them that
24 violated these laws that we talked about
25 before.

1 Q. Okay. Now let's -- I see you
2 already have it in front of you, but I'm going
3 to -- we're going to talk about your report a
4 little bit, which has been marked Exhibit 3.

5 And you -- do you recognize the
6 document marked as Exhibit 3?

7 A. I do.

8 Q. What is it?

9 A. Looks like my report.

10 Q. Okay. If you turn to Page 33 of the
11 document, there's a date, and then there's a
12 signature.

13 Is that your signature?

14 A. It is.

15 Q. Okay. You executed this on -- the
16 report on November 13th, 2015?

17 A. That sounds right.

18 Q. Is it correct that you did not sign
19 this document under penalty of perjury?

20 A. I don't quite understand the
21 question.

22 Q. Well, you referenced earlier in --
23 in some of your cases where you -- I think you
24 weren't an actual expert, but you were a -- you
25 submitted the declaration or an affidavit. And

1 normally that kind of document is submitted
2 under oath --

3 A. Yes.

4 Q. -- under penalty of perjury. "I
5 declare that all the foregoing is true and
6 correct under the -- under the laws of the
7 U.S.," something like that. And I'm just -- I
8 just noticed that that was not -- that language
9 isn't anywhere in here.

10 And I'm just wondering is that
11 correct; and if so --

12 A. Oh.

13 Q. -- why is that?

14 A. I have no idea. This is in the
15 space of like legal things that do or don't go
16 into this that I don't understand. So --

17 Q. Sure.

18 A. -- if it should have been there,
19 there was no intentional reason to leave it
20 off.

21 Q. Okay. Do you believe that this --
22 your report is accurate --

23 A. I do.

24 Q. -- as you sit here today?

25 A. Yes.

1 Q. Are there any changes you would want
2 to make to it?

3 A. I don't think so.

4 Q. Who prepared the report?

5 A. I did.

6 Q. How exact- -- tell me at a high
7 level first sort of how it -- how this document
8 came into existence.

9 A. I wrote the whole thing. It got put
10 in this nice format by counsel. Yeah. It kind
11 of came about in, you know, pieces.

12 Q. When you say "pieces," what do you
13 mean?

14 A. I drafted, you know, sections one at
15 a time. So --

16 Q. Uh-huh.

17 A. -- the first section on my
18 qualifications, which was pretty easy --

19 Q. Sure.

20 A. -- for me the write.

21 Q. Of course?

22 A. So, you know, I worked separately on
23 each of the different main sections here and
24 then --

25 Q. Uh-huh.

1 A. -- put it all together.

2 Q. You drafted every line of this
3 report?

4 A. I did. I had help from counsel on
5 my understanding of the legal concepts. You
6 know, they did some copy editing. But I did
7 draft the whole thing myself.

8 Q. When you say "copy editing," what do
9 you mean by that?

10 A. Looking for typos. They helped
11 check a bunch of like the section references,
12 the Bates numbers. I'm sure they probably
13 proofed a lot of the quotes and things.

14 Q. Were there different drafts that
15 were -- that were prepared?

16 A. I did have a lot of drafts.

17 Q. And how many total drafts do you
18 think you had?

19 A. Maybe 15.

20 Q. Did each of those drafts -- did you
21 show each of those drafts to counsel?

22 A. I don't think they saw all of them.

23 Q. Did they -- how many did they see?

24 A. You know, it depends where you draw
25 the line between one draft and another. I tend

1 to renumber every single time I get a document
2 back, even if there's not many changes or just
3 comments in it.

4 They probably saw the last five or
5 six, I would guess.

6 Q. And did they -- you would send them
7 -- you would send -- e-mail them a draft?

8 A. Yes.

9 Q. And then would they revise it in any
10 way?

11 A. They would note if there were typos,
12 that kind of thing. They would send it back
13 sometimes with questions, asking for
14 clarification on certain points that I had put
15 in there.

16 Other than the, you know,
17 formatting, which they put it into this
18 format --

19 Q. Uh-huh.

20 A. -- for me, I don't recall them
21 really revising anything.

22 Q. So is it your testimony that there
23 are not parts of this report that were drafted
24 by counsel?

25 A. I think that's right. Like I said,

1 I relied on them for the legal understanding.
2 And so they worked close- -- closely with me on
3 the language there since it has to be so
4 precise.

5 Q. What sections are you talking about
6 in particular?

7 A. Let me take a look and go through
8 here.

9 So on Page 29, Section 8, "In the
10 ordinary course of business" -- oh, no. That's
11 just -- I'm sorry. That's citing this case.

12 So like at the end of that page --

13 Q. Page 29?

14 A. -- Page 29, I'm sure they supplied
15 me with this quote in reference to the Gmail
16 litigation.

17 Q. Okay.

18 A. And then on Page 32, in Section 9,
19 there's a discussion of a couple cases there in
20 Paragraph 116. Just reading this, I definitely
21 drafted this. I'm sure they provided me with
22 the citation. We've talked about that Carrier
23 IQ case before, so I haven't read it myself.

24 So that's a section where they --
25 where I would have worked with them to make

1 sure that I represented the law correctly.

2 Q. Okay. Anything else?

3 A. Looking through here, that looks
4 like it covers it.

5 Q. There is a section of this report,
6 as long as we're on this subject, starting at
7 Page 85 -- I'm sorry -- Paragraph 85 --

8 A. Paragraph...

9 Q. -- Page 24. And we -- we'll go
10 through this in more detail.

11 But you have a description of sort
12 of what Facebook did internally after this Wall
13 Street Journal article was published in October
14 of 2012, a reporting on -- you know, that
15 sending a URL in a message might increment Like
16 counter by two.

17 Was this also a section that you --
18 you drafted?

19 A. I did.

20 Q. Okay. Okay. And again, we'll go
21 through it in a little bit more detail.

22 Directing your attention to
23 Paragraph 12, you say: "In preparing this
24 report, I have employed methods and analyses of
25 the type reasonably relied upon by experts in

1 my field in forming opinions or inferences on
2 the subject. The opinions expressed are based
3 upon a reasonable degree of computer science
4 certainty."

5 You see that?

6 A. I do.

7 Q. Is that true of every opinion
8 offered in this report?

9 A. Which part of it?

10 Q. Well, each one. We can break it
11 out.

12 Like -- so let's start with the
13 first sentence in Paragraph 12. You say you've
14 employed methods and analyses of a type
15 reasonably relied upon by experts in my field
16 in forming opinions or references on the
17 subject.

18 Is that sentence true for every
19 opinion you've offered in this report?

20 A. I believe that's true.

21 Q. And what about the second sentence,
22 for every opinion in this report, that your
23 opinion is based upon a reasonable degree of
24 computer science certainty?

25 A. Certainly all the computer science

1 opinions that I offer are based on a reasonable
2 degree of computer science certainty. I'm just
3 trying to think if there's anything else in
4 there.

5 I think overall that's fair to say.

6 Q. So you say certainly the computer
7 science opinions you offer are based upon a
8 reasonable degree of computer science
9 certainty.

10 Are there opinions in this report
11 that you would consider to not be computer
12 science opinions?

13 A. Yeah. That's why I was pausing --

14 Q. Sure.

15 A. -- to just think if there's anything
16 in there that wouldn't fall into that space.

17 As far as I consider it, I think
18 everything in here is computer science based.

19 Q. When you say "computer science
20 based," what do you mean by that?

21 A. That it falls within the scope of
22 things that we've discussed in the field of
23 computer science.

24 Q. What does it mean to say that an
25 opinion is based on a reasonable degree of

1 computer science certainty?

2 A. So -- so, for example, if we talk
3 about the code, the Facebook code is the most
4 complex code system that I have ever looked at
5 by at least an order of magnitude. It's --
6 it's crazy what's going on in that code.

7 So there are -- are conclusions that
8 I have to make as one who doesn't have the
9 entire code base in my head, which I don't
10 think anyone on earth has, including the
11 Facebook engineers.

12 So, for example, there are comments
13 in the code that describe what's going on or
14 things are named in a certain way that I rely
15 on to kind of guide my understanding that I
16 think any other computer scientist would do.

17 It could be the case that there's
18 some crazy Facebook engineer who gave
19 everything names that has nothing to do with
20 what it actually does and led me down a path
21 that kind of made sense but does something
22 different. I think there's basically no chance
23 of that happening.

24 But I relied on some of these kinds
25 of things, which I think any computer scientist

1 would do, you know, looking at comments,
2 looking at the names in the code that I think
3 gives a high degree of computer science
4 certainty, yeah.

5 Q. To have a high degree of computer
6 science certainty, would you -- would you
7 actually have to -- have to look at the code
8 for a specific opinion in order to say, "Yeah,
9 I have a reasonable degree of computer science
10 certainty that this -- what I'm saying is" --
11 "is accurate"?

12 A. I think it depends on the opinion
13 and, you know, what other evidence there is to
14 support it.

15 Q. Okay. If you could turn your
16 attention to Exhibit B to your report.

17 A. It's at the very back, right?

18 Q. Yes.

19 See that?

20 A. I do.

21 Q. Okay. Is this the list of materials
22 that you relied on in forming your opinions in
23 your report?

24 A. It is.

25 Q. Is it a -- is it a complete list?

1 A. It looks like a complete list.

2 Q. Did you consider or rely upon any
3 other documents in forming your opinions in
4 this case?

5 A. I certainly read more documents that
6 Facebook produced than are listed here. But
7 these are all the ones that I cite as evidence
8 for my opinions.

9 Q. Well, are there any documents that
10 you read but don't cite in your report that
11 support your opinions in the report?

12 A. So is the question are there other
13 documents that would support my opinions?

14 Q. Well --

15 A. Or have I left --

16 Q. Not --

17 A. -- some out --

18 Q. Not exactly --

19 A. -- that I've relied on?

20 Q. Yeah. More the second one.

21 A. I don't think so.

22 Q. Okay. You tried to be comprehensive
23 when -- when documenting the conclusions you
24 reached in this report?

25 A. I did.

1 Q. Okay. The documents listed in
2 Exhibit B, did you review all of these -- all
3 of these documents before you signed the report
4 on November 13th?

5 A. I believe I did, yes.

6 Q. Okay. Now, towards the top of
7 Exhibit B, you list two depositions, deposition
8 of [REDACTED] [REDACTED] spelled [REDACTED], on September 25th,
9 2015; and the deposition of [REDACTED] [REDACTED],
10 October 28, 2015.

11 You see that?

12 A. I do.

13 Q. Did you read the transcripts for
14 both of those depositions or -- sorry. Go
15 ahead.

16 A. So I did read the transcripts, but I
17 also virtually -- I believe I virtually
18 attended both of those depositions as well.

19 Q. You were on a --

20 A. Like a video thing so I could watch
21 and listen, but I -- I --

22 Q. Right?

23 A. -- couldn't speak.

24 Q. Could you -- when you were doing
25 that, could you see the witnesses?

1 A. I definitely could see [REDACTED] [REDACTED]. I
2 don't remember if I had the video on for
3 [REDACTED] [REDACTED]. I think I might have been like
4 doing some of that "mobilely" and was just
5 listening.

6 Q. Understood.

7 So you both -- you -- you listened
8 to these or watched these depositions while
9 they were happening, but then you also reviewed
10 the -- the depo transcripts?

11 A. That's right.

12 Q. Did you review the deposition
13 transcripts in full?

14 A. I probably skipped over some of --
15 especially the opening kind of foundational
16 sections.

17 Q. Okay. You also list Exhibit --
18 again, in the documents you reviewed, Exhibit F
19 to the declaration of Alex Himel on behalf of
20 Defendant Facebook, Inc.

21 You see that?

22 A. Yes.

23 Q. Did you review the entire
24 declaration of Alex Himel and all exhibits or
25 just Exhibit F?

1 A. I reviewed the entire declaration.

2 Q. But I guess you're -- but you're
3 just relying upon Exhibit F to the declaration
4 in support of your opinions?

5 A. I think that's right. I cite --
6 there's specific pieces of code in discussions
7 with Facebook engineers that I'm pretty sure I
8 cite in here. I don't think there was anything
9 in the actually declaration that I used to
10 support my opinions.

11 Q. Did you consider the other parts of
12 that declaration in forming any of your other
13 opinions?

14 A. What do you mean by that?

15 Q. Like did you -- so it's a lengthy
16 declaration with lots of other exhibits.

17 And I guess I'm just wondering,
18 other than Exhibit F, which clearly you
19 considered and you relied on in reaching your
20 conclusions, did you consider or not whether
21 the other parts of the Himel declaration were
22 relevant to your analysis?

23 A. I did. And this is why I always
24 sort of struggle with these materials relied on
25 in forming my opinions, right?

1 You know, as we discussed at the
2 beginning, there are cases that I've turned
3 down because, you know, I don't believe in the
4 merits of them. I keep that in mind. Like
5 this is not the most fun way for me to spend my
6 time, getting deposed, right?

7 So I -- I really won't do it unless
8 I think a case is legitimate. So I -- I
9 actively look for things that I think are
10 contrary to what I think is true.

11 So, you know, like Alex Himel had a
12 lot to say in that declaration. You know, I
13 read it. I considered it. I looked at it.

14 Here this is -- you know, the
15 exhibits are what I cited to support the
16 opinions in my report. But I certainly
17 considered that and a lot of other documents
18 that aren't cited here in kind of generally
19 forming my opinions about the case.

20 Q. Exhibit B also has a list of
21 documents that are -- have production numbers
22 that start with FB.

23 Do you have a general recollection
24 of what those documents are, just in general?

25 A. So some of them I believe are

1 printed copies of the source code. Other ones
2 are documents that came from Face- -- Facebook
3 production.

4 So some I know are discussions
5 between engineers about code changes. I
6 think -- I think that's actually a lot of the
7 ones that aren't source code. And I think
8 there's a few other kind of internal Facebook
9 documentation kind of files in there.

10 Q. Are there some e-mails included?

11 A. Yeah. So when I say conversations
12 between engineers, I think they actually take
13 place in the Facebook messaging system.
14 They're not allowed to e-mail each other. They
15 have to use Facebook Messenger.

16 Q. Did you rely on any of those written
17 communications between and among Facebook
18 engineers to draw conclusions about the
19 functionality of Facebook's source code?

20 A. It certainly pointed me to and
21 explained what some of the source code would
22 do. But I think, in any of the cases where
23 that mattered, I looked at the code myself as
24 well.

25 Q. Did you make any attempt -- well, if

1 a particular e-mail was discussing a certain
2 functionality, did you make any attempt to
3 determine the time period during which any such
4 functionality would have been operational?

5 A. I did.

6 Q. How did you do that?

7 A. So those Facebook engineer
8 discussions all had dates on them. So it was
9 pretty easy to see when that was functional.
10 If they were talking about a feature
11 that was active in say 2009 -- I know some of
12 the e-mails were from then -- I looked at other
13 versions of the source code, because we could
14 look at it across time in what we had
15 available, and looked at that as well.

16 Q. Okay. Now, at the bottom of Exhibit
17 B, at least the bottom of the first page, you
18 do list "Source Code Produced By Facebook."

19 A. Yes.

20 Q. What are you referring to there
21 specifically?

22 A. So, as I mentioned in the -- the
23 Bates numbers that are above, some of those are
24 to specific source code files. And as I'm sure
25 you've seen in the report, I have actual

1 excerpts of code pasted in there.

2 So I cite to the particular files
3 that we printed when I cite particular bits of
4 code. But as I mentioned, the code is
5 ridiculously complex. And so my understanding
6 of what's going on in the code is not just
7 from, you know, the three lines that I pasted
8 in but from a lot of time spent reading and
9 understanding the code and how it fits
10 together.

11 I couldn't possibly cite all of
12 those lines and connections because it -- it
13 would almost be just giving you the source code
14 back.

15 So I definitely used information
16 from my review of the source code to understand
17 the individual lines that I've cited there.

18 Q. And then finally on Exhibit B you
19 have a section called "Other Materials."

20 What are those, generally?

21 A. External Web sites. So some of
22 them -- there's a couple Internet archive
23 pages. Some are Facebook documents that were
24 published on the Web. There's a Wall Street
25 Journal article that you're familiar with.

1 Q. Uh-huh.

2 A. And I believe those last two
3 links -- the last one is definitely Michael
4 Hurley's Facebook profile. I believe the one
5 above that may be his, too, just indexed by his
6 user ID instead of his screen name.

7 Q. I see one of the items you missed.
8 Appears to be some developer guidance from
9 Facebook. Maybe the fourth line down.

10 A. Yeah. I -- I'm sorry. I would
11 count that as an internal Facebook document
12 published on the Web.

13 Q. What do you mean by "internal"?

14 A. Something that Facebook created.
15 So -- so I don't mean it internal as just for
16 Facebook employees, but not just something that
17 some guy posted on Facebook. Like it was
18 actually posted by Facebook itself.

19 Q. Right.

20 And it's -- it is or was available
21 on the World Wide Web to --

22 A. To anyone, yes.

23 Q. Okay. Did you consult the developer
24 pages for all of the functionality you discuss
25 in your report?

1 A. I mean a lot of the functionality in
2 the report wasn't necessarily described on the
3 developer pages. So I think I looked for -- I
4 looked for as much of it as I could, right,
5 because those are great things to use to
6 understand what's going on in the code.

7 A lot of it I just didn't see
8 described in the developer documentation.

9 Q. Did you review the developer
10 guidance that was in effect in 2011 and 2012
11 regarding what specific things went into the
12 counter next to a Like button social plug-in?

13 A. Yeah. I think we -- this is testing
14 my memory a little bit. I'm sure I looked it
15 up on the Internet archive just to see it. But
16 I think we also received it -- Facebook
17 produced a document that had some of that in
18 it. I believe that's the case.

19 Q. But you didn't rely on that?
20 Because I don't see it listed here.

21 A. Yeah. I -- again, we can probably
22 go through this, and I'll see it. But I think
23 -- I think, in an initial draft of this, I had
24 -- I may even have included some of that
25 developer documentation, and then it just kind

1 of didn't fit in -- it -- it felt like it was
2 kind of going off on a tangent, so I dropped it
3 and would have dropped the citation then.

4 Q. Okay. Let's touch base -- what I
5 thought we would do, although we could take a
6 break now if you want, but maybe go till 1:00
7 and then do lunch, and then I think we'll be
8 like halfway through at that point.

9 MR. RUDOLPH: Okay.

10 MR. JESSEN: Roughly.

11 THE WITNESS: Fine.

12 MR. JESSEN: Does that work for you?

13 BY MR. JESSEN:

14 Q. Okay. What -- you -- so you
15 reviewed source code in this case.

16 A. I did.

17 Q. Facebook source code.

18 What time period does the source
19 code that you reviewed cover?

20 A. I just want to look in here because
21 I think the actual dates are in here, and I --

22 Q. Sure. Go ahead.

23 A. -- just always forget that.

24 Q. Of course.

25 A. So looking at Paragraph 14 on Page

1 3, I've noted here that that source code goes
2 from 2009 to December of 2012.

3 Q. Do you know why the source code does
4 not go past 2012?

5 A. So I -- I don't know exactly. I've
6 been told that that's the period that Facebook
7 said was relevant.

8 Q. You understand that Plaintiffs'
9 agreed to the code that was actually produced,
10 including the time period?

11 MR. RUDOLPH: Objection. Lacks
12 foundation.

13 THE WITNESS: I don't think I know
14 anything about that.

15 BY MR. JESSEN:

16 Q. You don't have any reason to think
17 they didn't agree to that, do you?

18 MR. RUDOLPH: Same objection.

19 THE WITNESS: I mean this is like
20 legal world stuff. I have no idea how you guys
21 operate.

22 BY MR. JESSEN:

23 Q. Understood.

24 You haven't seen any Facebook code
25 after December 2012, correct?

1 A. Not in this case, no.

2 Q. Okay. Did you see some in the
3 Rembrandt case?

4 A. Actually, I don't remember the --
5 the date when that stuff ended. You know, I've
6 look at JavaScript code from Facebook, which is
7 sent to the browser, since then. But the
8 back-end code, which is what they provide, you
9 know, on the computer in the locked room, I
10 don't recall seeing anything since 2012.

11 And, yeah, I think -- just thinking
12 through it, I think the Rembrandt case was --
13 was like 2009. Like there was -- it was much
14 older code that they were looking at, so I
15 don't think I saw anything newer.

16 Q. Okay. And I -- you're not rely --
17 your opinions in this case, you're not relying
18 upon any of the code you saw in the Rembrandt
19 case for your opinions here, correct?

20 A. That's right. I mean there's no
21 overlap between anything in that case and this.

22 Q. So how many times -- you understand
23 there's a -- there's a source code review room
24 at a law office in Palo Alto --

25 A. Yes.

1 Q. -- where the -- where the code --
2 the relevant code is hosted.

3 How many times have you been there
4 to review the code?

5 A. Twice.

6 Q. Okay. And was the first time on
7 August 4 of this year?

8 A. That sounds right.

9 Q. Who -- did anyone go with you to
10 review the code?

11 A. I think I was there just by myself
12 that time.

13 Q. Like the lawyers weren't with you
14 or...

15 A. Oh, no. I'm sorry. I've done a lot
16 of source code review over the summer too.

17 Q. Understood?

18 A. Yeah.

19 Q. Because of your other case too?

20 A. Because of the other case.

21 Q. Okay.

22 A. I'm just trying to separate them
23 out. Yeah, there were lawyers there. I don't
24 remember who they were. I'm sorry. But there
25 were a couple of lawyers there.

1 THE WITNESS: I don't know --

2 MR. RUDOLPH: That's okay.

3 THE WITNESS: -- if you were there
4 or not.

5 They were -- most of the time they
6 weren't in the room with me. I think --

7 BY MR. JESSEN:

8 Q. Right.

9 A. -- you know, I maybe talked to them
10 in the room with the code for the last half
11 hour.

12 Q. And other than you and the
13 attorneys, was anyone else there that day?

14 A. No.

15 Q. What was the purpose of going to
16 look at the code on or about August 4, 2015?

17 A. That was to start looking for
18 code --

19 Q. Uh-huh.

20 A. -- that was relevant to the
21 conclusions that are here in this report,
22 looking for how these things were handled.

23 Q. You were looking for code that
24 supported the conclusions in your report?

25 A. I was looking for code relevant to

1 the things that I discuss in the report,
2 proving it or disproving it.

3 Q. How long did you review the code
4 that day?

5 A. Seven or eight hours, I would guess.

6 Q. And then when was the second time
7 you reviewed the code actually at the -- at the
8 Palo Alto office?

9 A. I think it was in October of this
10 year.

11 Q. October 14th, 2015? Could that --

12 A. That sounds good.

13 Q. Could that -- could it be that?

14 A. Ah, that's exactly when it was, yes.

15 Q. That date sticks out in your mind
16 for a particular reason?

17 A. I ran a marathon the day before I
18 flew out there. So --

19 Q. Okay.

20 A. -- it was a little complicated
21 travel thing, yes.

22 Q. Which marathon?

23 A. Chicago.

24 Q. Nice.

25 Was it -- were attorneys there with

1 you that day as well?

2 A. David Rudolph came at the very end
3 of the day, I think the last half hour I was
4 there. But there were no lawyers there the
5 rest of the day.

6 Q. Was anyone else there?

7 A. No one was in the room with me.

8 Q. How many hours did you review the
9 code for that day?

10 A. I'd guess it probably was the same,
11 seven or eight hours.

12 Q. Okay. And was the purpose of that
13 review the sort of same as the first review, to
14 look for code that was relevant to the issues
15 you were going to be opining on?

16 A. It was. I had a more specific set
17 of things that I was looking for. But yeah, I
18 mean all of it was just kind of looking at how
19 -- understanding how specific systems within
20 Facebook operated.

21 Q. What were the more specific things
22 you were looking for?

23 A. So in particular I was looking at
24 Taste. I know I looked for code on Taste in
25 that visit. And then I think there were -- so

1 I had identified a number of files on my first
2 visit that I thought were interesting, and I
3 think there were a few additional ones that I
4 wanted to make sure that I looked at and kind
5 of traced the related functionality around with
6 on that second visit, just with respect to the
7 messaging procedures in general.

8 Q. So other than those two days of
9 reviewing the Facebook code, what other review
10 of the code have you done in this case?

11 A. So there's a code reviewer still
12 there looking at the code who's been there for
13 months, it seems like. He's working at my
14 direction.

15 So I -- the first time I went out
16 there -- remember you said that was August -- I
17 was the first one to look toot code.

18 Q. Uh-huh.

19 A. I -- as I mentioned before, none of
20 this code is -- at all overlaps with what was
21 in the Rembrandt case, but I did have a general
22 understanding of how it was structured, like
23 what kind of directories there were.

24 So I, you know, looked for the
25 messaging directories and identified the major

1 files that I thought were associated with that.

2 In addition, I think on that first
3 visit I also identified the files that were in
4 Alex Himel's declaration. They were redacted
5 in the declaration he sent. So I looked for
6 the -- those specific files.

7 Based on that, I developed a --
8 actually a pretty good understanding of what
9 was going on. But as I keep saying, it's super
10 complicated code. So a lot of what the code
11 reviewer has been doing is following the paths
12 that I wanted a kind of deeper verification on.
13 Because it can take hours and hours to trace
14 down those particular connections in the code.

15 So that's -- between my first visit
16 and my second, that's mostly what he was doing,
17 really just verifying the things that I found
18 in my first visit.

19 On the second visit, there are a
20 couple of files that he had mentioned he
21 thought were relevant that I looked at.

22 And then I started looking at Taste,
23 which the code reviewer hadn't looked at, did
24 the same kind of thing. Based on how I kind of
25 understood that it worked, I looked through the

1 files there. I identified the ones that kind
2 of, on a high level, looked like they were
3 relevant.

4 And I've been directing him to kind
5 of look at particular connections in the code
6 to verify that it works the way I thought it
7 did and -- to just flush out that
8 understanding.

9 In addition to that, I had pretty
10 extensive notes from my visits there. So I
11 spent some time just kind of putting that
12 together. Because there was a lot of, "Let's
13 just jot down some notes to figure -- and then
14 figure out how it all fits together."

15 I also have printouts of the source
16 code. Almost all of that is files that I found
17 on my two visits there, which are the ones
18 cited here in Bates numbers.

19 I think there's one file that the
20 code reviewer found that I hadn't seen myself.
21 And -- and that's one where I reviewed the code
22 in printout form instead of on the computer at
23 the Cooley office.

24 Q. The reviewer is David Cartt?

25 A. That's right.

1 Q. Are you relying on Mr. Cart's
2 representations at all about the functionality
3 of the code?

4 A. I'm not.

5 Q. Are you relying on his
6 representations about the actual code that he
7 reviewed?

8 A. I -- I don't understand what that
9 question means.

10 Q. Well, if he tells you he -- he -- "I
11 look at these ten files," I mean is that -- I
12 assume you rely on that.

13 A. So I believe him that he said he
14 looked at them.

15 Q. Right?

16 A. I can't really form any opinions
17 based on the fact that he looked.

18 Q. When you say he's working at your
19 direction, what do you mean by that?

20 A. So we have calls frequently where
21 he'll kind of say, "Here's what I looked at
22 today. Here's what seems to be happening."

23 And I'll ask him to spend his time
24 the next day looking at -- you know, chase down
25 this feature. Or see how these things connect.

1 Or don't bother looking at that anymore. Let's
2 look at this other thing.

3 Q. Who's paying Mr. Cartt?

4 A. I don't know.

5 Q. Not you?

6 A. Not me.

7 Q. Okay. What is he still looking for
8 in Facebook's code?

9 MR. RUDOLPH: I'm going to instruct
10 the witness not to answer. This goes to
11 communications between the expert and counsel.

12 BY MR. JESSEN:

13 Q. Are you going to follow your --

14 A. I'll -- I'll do what he says.

15 Q. -- attorney's instruction?

16 Well, let me ask it like this:

17 Without divulging the substance, is Mr. Cartt
18 looking for source code to confirm opinions
19 you've already reached, or is he looking for
20 code to -- that would inform new opinions?

21 MR. RUDOLPH: Same instruction.

22 BY MR. JESSEN:

23 Q. Are you going follow your counsel's
24 instruction?

25 A. I am.

1 Q. Okay.

2 A. Does anybody ever not? Yes? Okay.

3 Q. I haven't seen it. It's not beyond
4 the realm of possibility.

5 How much longer do you think
6 Mr. Cartt's going to be looking at the code?

7 MR. RUDOLPH: Same instruction.

8 THE WITNESS: I'll do what he says.

9 MR. JESSEN: Well, I'm not asking
10 for the substance of the conversation.

11 MR. RUDOLPH: If you know the answer
12 to that question, you can -- you can answer.

13 THE WITNESS: So I don't -- I don't
14 really know. Can I give you an answer that I
15 won't be held to?

16 BY MR. JESSEN:

17 Q. Yeah. I'm not going to hold you to
18 it. I'm just trying to get a sense of how much
19 longer he's going to be looking at it.

20 MR. RUDOLPH: Don't -- don't
21 speculate.

22 THE WITNESS: Oh. I would totally
23 have to speculate.

24 BY MR. JESSEN:

25 Q. How much more time do you think you

1 need him to look at the code?

2 You can give me a -- I don't want
3 you to guess, but you can give me your best
4 estimate.

5 MR. RUDOLPH: Don't -- don't guess.

6 THE WITNESS: Let me give you some
7 qualifications maybe. No. I would totally
8 have to guess even if -- even if I give you
9 some qualifications.

10 BY MR. JESSEN:

11 Q. Okay. All right.

12 A. One answer that a Facebook engineer
13 gave in a 30(b)(6) deposition, he was asked a
14 question about how many -- "How many times have
15 you been deposed before?"

16 And he said, "More than two and less
17 than 10,000," which I thought was a little
18 snarky.

19 But I would say, in terms of days,
20 that's probably true for how long Mr. Cartt
21 will be reviewing the code.

22 Q. I don't think it was less than
23 10,000, but...

24 The -- okay. You're aware that
25 Facebook employees have given 30(b)(6)

1 deposition testimony?

2 A. Yes.

3 Q. That included a discussion of the
4 source code functionality?

5 A. Yes.

6 Q. Okay. And you were present either
7 telephonically or virtually for the deposition
8 of [REDACTED] [REDACTED] on October 28, 2015?

9 A. I believe I was there for most of
10 that deposition, yes.

11 Q. And you read that deposition
12 transcript?

13 A. Yes.

14 Q. Did you request any source code
15 printouts based on information about source
16 code files that [REDACTED] [REDACTED] testified about?

17 A. I understand the question and -- so
18 I don't -- I don't think he simply mentioned
19 something and I said, "Print that code out for
20 me."

21 You know, not having it in -- in
22 front of me, you know, just going on my best
23 recollection, most of what he went through
24 there was code I was already familiar with. I
25 had either looked at it or reviewed it myself.

1 I'm sure he looked at some other
2 files that just didn't seem to have anything
3 relevant.

4 If there was anything that he
5 mentioned that I didn't know about, I would
6 have asked David Cartt to take a look at it and
7 print it out for me if I had to.

8 But I don't recall, off the top of
9 my head, anything specific from his deposition
10 that I hadn't already looked at.

11 Q. Are you aware that [REDACTED] [REDACTED], [REDACTED] [REDACTED],
12 which is the same as [REDACTED] [REDACTED] I mentioned
13 earlier, [REDACTED], was als- -- also gave 30(b)(6)
14 deposition testimony on source code
15 functionality that same day, October 28, 2015?

16 A. I -- I don't know that I knew that.

17 Q. Okay. You're not -- you didn't
18 review any testimony from [REDACTED] [REDACTED] given on
19 October 28, 2015, correct?

20 A. Not that I recall.

21 Q. And you weren't there -- you didn't
22 appear for that deposition telephonically or
23 through the computer.

24 A. That's right.

25 Q. You know why -- you know why you

1 have a -- you're not aware of that or...

2 A. I -- I don't know. I don't know why
3 I don't know.

4 Q. Okay. Did you review the deposition
5 transcript of [REDACTED] [REDACTED]?

6 A. I think I've seen parts of that. I
7 don't remember if I've read the whole thing or
8 not. I do know that he was deposed. And I
9 know I've seen parts of that, but I -- I just
10 don't remember if I got the whole transcript or
11 not.

12 Q. What about the deposition transcript
13 of [REDACTED] [REDACTED]?

14 A. That I don't --

15 Q. He's --

16 A. -- believe I've seen.

17 Q. Okay. How much total the time do
18 you think Mr. Cartt has spent reviewing the
19 source code?

20 A. It's hard for me to tell because
21 I -- I know part of the time he's there
22 part-time, and he works on some other cases.
23 Probably a couple hundred hours, I would guess.

24 Q. Who is -- do you know a Gary
25 Stringham?

1 A. I do.

2 Q. Who is he?

3 A. He's another code reviewer.

4 Q. And was he -- was he also reviewing
5 the Facebook code at some point in this case at
6 your direction?

7 A. He was.

8 Q. But at some point he stopped doing
9 the code, and the code review went to
10 Mr. Cartt?

11 A. Yes.

12 Q. What was the reason for the switch
13 from Mr. Stringham to Mr. Cartt?

14 MR. RUDOLPH: I'm going to instruct
15 the witness not to answer that.

16 MR. JESSEN: On what grounds?

17 MR. RUDOLPH: It goes to
18 communications between attorneys and Dr.
19 Golbeck.

20 BY MR. JESSEN:

21 Q. Do you have an understanding,
22 separate an apart from any communication you've
23 had with plaintiffs' counsel, regarding why
24 Mr. Stringham stopped doing the code review?

25 A. No. I think it's all stuff that

1 we've talked about.

2 Q. Do you know how long Mr. Stringham
3 reviewed the source code -- Facebook source
4 code?

5 A. I think it was a few weeks that he
6 was out there looking at it, but I don't really
7 remember beyond that.

8 Q. And I forgot to mention this
9 earlier, but when he instructed you not to
10 answer earlier, you're going to follow his
11 instruction?

12 A. I am.

13 MR. JESSEN: Okay. Okay. I think
14 we're at a good stopping point.

15 THE WITNESS: Great.

16 THE VIDEOGRAPHER: Off the record at
17 12:54.

18 This is the end of Media Unit No. 2.
19 (A lunch recess was taken.)

20 THE VIDEOGRAPHER: On the record at
21 1:50.

22 This is the beginning of Media Unit
23 No. 3 in the deposition of Dr. Jennifer
24 Golbeck.

25 BY MR. JESSEN:

1 Q. Okay. Welcome back, Dr. Golbeck.

2 A. Thanks.

3 Q. If you could direct your attention
4 to Paragraph 16 of your report, which is
5 Exhibit 3, starting on Page -- the bottom of
6 Page 3.

7 A. Yep.

8 Q. Paragraph 16 of your report lists
9 the issues you have been asked to opine on; is
10 that correct?

11 A. That's correct.

12 Q. All right. Let's just briefly walk
13 through these. You -- number -- or Letter A:
14 "The structure and function of Facebook's
15 messaging system."

16 Do you see that?

17 A. Uh-huh.

18 Q. That's one --

19 A. Yes.

20 Q. -- issue you've been asked to opine
21 on?

22 A. It is.

23 Q. During what period of time have you
24 been asked to opine on the structure and
25 function of Facebook's messaging system?

1 A. So I've -- I've looked at it really
2 throughout the -- the time that the code and
3 the documents covered, which I believe
4 basically go back to 2009.

5 Q. Okay.

6 A. So I've provided opinions on that
7 whole period but obviously focused on the class
8 period, which I believe starts in 2000 -- end of
9 -- very end of 2011.

10 Q. Okay. So you're starting -- you've
11 -- I understand you've looked at documents and
12 code going back to 2009.

13 But how far in the -- in the future
14 then from 2009 are you going --

15 A. Oh.

16 Q. -- specifically with respect to your
17 opinion on the structure and function of
18 Facebook's messaging system?

19 A. So I have a few documents from post
20 2012 that I've considered, but I think the bulk
21 of the material I have, including the source
22 code, only goes up to December of 2012.

23 Q. Okay. Would you feel comfortable
24 opining on the structure and function of
25 Facebook's messaging system after 2012?

1 A. So it depends on the questions that
2 you have for me. There are some things that --
3 that I think I'd be very comfortable with. And
4 others, depending on how detailed the question
5 is --

6 Q. You're not assuming that the code
7 that exists now is the same as it was in 2012,
8 are you?

9 A. I'm sure the code has changed. The
10 -- my -- my understanding -- and again, this is
11 getting into legal details -- is that the code
12 that is -- that we were provided, which goes up
13 I think to December 30th, 2012, is the code
14 that Facebook thought was relevant. So that's
15 what I have to go on.

16 Q. Right.

17 But again, my question is you're not
18 assuming the code in existence now is the same
19 it was -- as it was in 2012. You're not making
20 that assumption.

21 Or are you?

22 A. No. I'm -- I'm certain that there
23 have been changes to the code since 2012.

24 Q. You don't know what those changes
25 are?

1 A. No.

2 Q. Okay. B on Page 4, the second topic
3 you've been asked to opine on is: "Facebook's
4 interception of private message content."

5 You see that?

6 A. I do.

7 Q. What do you mean by the word
8 "interception"?

9 A. So my understanding, as it applies
10 here, is essentially that it's the redirection
11 of the private message content to be used by
12 code that's -- that's not related to or
13 necessary for the delivery of the private
14 message.

15 Q. What do you mean by redirection of
16 the private message content?

17 A. That the content of the message --
18 I'm just trying to think how to rephrase that
19 because it makes sense to me.

20 The content of the message is sent
21 to code that is -- that performs some other
22 purpose than delivering the message.

23 Q. Content of the message is sent to
24 Facebook code?

25 A. In this case, we're talking about

1 Facebook code. I think my analysis would apply
2 if it were third party code, too, depending.

3 Q. But you're not claiming that
4 Facebook is redirecting the content of private
5 messages to third parties, are you?

6 A. That's correct. I'm not claiming
7 that.

8 Q. Okay. So when you talk about an
9 interception, you're talking about the
10 redirection of private message content within
11 another part of Facebook for purposes that you
12 think are necessary to deliver the message?

13 A. That's a fair summary, yes.

14 Q. Okay. What do you mean when you --
15 when -- by "private message content"?

16 A. What's unclear about that?

17 Q. I'm not saying it's unclear. I'm
18 just trying to figure out what you're --
19 what -- what specifically you're talking about.

20 A. Oh. I'm not trying to be snarky,
21 but I would say it's the content of private
22 messages. I -- I -- I'm just not sure what
23 detail --

24 Q. So everything that I type into -- if
25 I send you a message, everything that I type

1 into the text box --

2 A. Would be content.

3 Q. That's the contents?

4 A. Yeah. As we were --

5 Q. Okay.

6 A. -- discussing before, we were
7 talking about the URL attachments, which are --

8 Q. Right.

9 A. -- obviously core at issue here. I
10 would consider those part of the message
11 content.

12 Q. Okay. That's what I'm getting at.

13 So that's -- you think -- your view
14 is an attachment of a URL preview is also
15 content.

16 A. That is, yes.

17 Q. Okay. Were you asked to assume that
18 there would have been a, to use your term,
19 interception?

20 A. No.

21 Q. Okay. You reached that conclusion
22 on your own?

23 A. I did.

24 Q. Going back to Paragraph 16, you have
25 a sub-bullet point -- or not a bullet point --

1 but a sub Roman numeral. It says: "Whether in
2 what devices Facebook employs to intercept
3 message content."

4 A. Yes.

5 Q. What do you mean by "devices"?

6 A. So in this case, code that, as I
7 said before, is not code used to deliver the
8 message. It's basically separate code.

9 Q. You've also been asked to opine on
10 whether the interceptions occurred in transit?

11 A. Yes.

12 Q. What do you mean by "in transit"?

13 A. So whether that redirection of the
14 content to that code --

15 Q. Yeah.

16 A. -- took place when the message was
17 not in storage. So basically between the point
18 that message would send and it was delivered to
19 the recipient, that -- that would be the
20 transit period if it was done when the message
21 was between those phases and not in storage.

22 Q. Uh-huh. What -- what do you mean
23 when you say "in storage"? What kind of
24 storage are you talking about?

25 A. So in this case, I would be talking

1 about, you know, stored in a database, some
2 type of permanent storage where the message
3 kind of sits and is held and can be accessed
4 later.

5 Q. Uh-huh. Okay. You were also asked
6 to opine on whether the interception of private
7 message content was necessary for Facebook to
8 deliver private messages?

9 A. Yes.

10 Q. What do you mean by "necessary"?

11 A. Since these are messages going
12 through Facebook, right, I type it in the
13 Facebook Messenger. I send it. It's deliver
14 by Facebook to another user.

15 Facebook obviously has to have that
16 message in order to deliver it, right? So the
17 fact that Facebook had and delivered the
18 message doesn't mean that it was an
19 interception that -- that would cause any
20 problems under the issues that are at stake
21 here.

22 So I was really looking at if the
23 content of the message was passed to code and
24 the code was not a necessary part of that
25 delivery process.

1 Q. Is it your understanding that that's
2 a -- that whether or not the code was val- --
3 was necessary for the delivery process, is it
4 your understanding that that's -- that's a --
5 somehow important to the -- to the lawsuit?

6 A. It's my understanding that that is
7 important to the lawsuit.

8 Q. In what way?

9 MR. RUDOLPH: Objection. Calls for
10 legal conclusion.

11 BY MR. JESSEN:

12 Q. You can answer.

13 A. Okay. So yeah. I -- I don't want
14 to give too much of a legal opinion. My
15 understanding of the law is that, if Facebook
16 took the message content and, say, put it
17 through a spam filter, which is one issue that
18 we've talked about --

19 Q. Uh-huh.

20 A. -- that that wouldn't necessarily
21 constitute a legal problem here.

22 I haven't really analyzed the spam
23 filters in particular, but there are processes
24 which could be necessary towards the
25 functioning of the messaging system and others

1 that aren't.

2 And this -- whether or not it's
3 necessary, my understanding, is important for
4 whether or not these laws were violated.

5 Q. So your understanding is that, if a
6 message is processed for a reason that's not
7 necessary to the delivering of the message,
8 that the two laws at issue in this case are
9 violated?

10 MR. RUDOLPH: Objection. Calls for
11 legal conclusion.

12 THE WITNESS: I feel like there's a
13 lot of subtlety not captured in what you just
14 said.

15 BY MR. JESSEN:

16 Q. Well, I'm just trying to -- I'm
17 trying to understand why you think it's
18 important whether or not a specific
19 functionality was necessary for the delivery to
20 the -- delivery of the message. And I think
21 you said that you thought that was like an
22 important issue in the case.

23 And so I'm just asking you like is
24 it your -- are you under the impression -- I'm
25 not trying to put words in your mouth -- that,

1 if a process -- an electronic process takes
2 place on a message -- on a Facebook message
3 that's not necessary to delivering the message,
4 that that violates the statutes at issue in
5 this case?

6 MR. RUDOLPH: Objection. Calls for
7 legal conclusion. Asked and answered.

8 THE WITNESS: So if I can rephrase
9 that maybe to better reflect my understanding.

10 BY MR. JESSEN:

11 Q. Sure.

12 A. It's that, if the message is
13 intercepted and processed by some code, and
14 that code is necessary for the delivery, it's
15 my understanding that the lawsuit at issue in
16 this case would not be violated. So it's kind
17 of flipping around what you said.

18 I -- from the way that you phrased
19 it, if it's intercepted by code that's not
20 necessary, I think other things have to be true
21 for the laws to be violated.

22 Q. What other things?

23 A. For example, bullet point B2 there,
24 that it has to occur in transit.

25 Q. So your understanding is, if there

1 is some electronic process that occurs in
2 transit that's not necessary to delivering the
3 message, then that would violate these laws.

4 MR. RUDOLPH: Objection. Calls for
5 legal conclusion.

6 THE WITNESS: Yeah. You're really
7 pushing my legal education here.

8 So I think those things need to be
9 true. My understanding of the law is that
10 there also has to be a device that does that
11 interception.

12 BY MR. JESSEN:

13 Q. Is it necessary to filter messages
14 for spam in order to deliver them?

15 MR. RUDOLPH: Objection. Form.

16 THE WITNESS: What do you mean by
17 "necessary"?

18 BY MR. JESSEN:

19 Q. Well, you're talking in your report
20 about things that are necessary. And so I'm
21 using it in the same way you're using it.

22 Can I -- can Facebook
23 technologically deliver private messages
24 without filtering them for spam?

25 A. So to that question, can Facebook

1 technologically deliver messages --

2 Q. Uh-huh.

3 A. -- without filtering them for spam,
4 they can.

5 Q. Okay. But you're not of the view, I
6 gather, that filtering messages for spam
7 violates these laws, are you?

8 MR. RUDOLPH: Objection. Form.
9 Calls for legal conclusion.

10 THE WITNESS: I haven't formed an --
11 I haven't stated an opinion on that either way
12 here. I suppose it could depend on how it's
13 implemented, whether or not it would violate
14 these laws. I haven't thought deeply about it.

15 I could see it going either way.
16 It's not the basis of my conclusions here
17 though.

18 BY MR. JESSEN:

19 Q. Understood.

20 Okay. Going down to the next
21 subpoint, C, Facebook's subsequent use of that
22 private message content, that's something else
23 you've been asked to opine on.

24 What do you mean by "use"?

25 A. What Facebook does with the content

1 that is intercepted from the private messages.

2 Q. And what content are you referring
3 to specifically?

4 A. So most of -- I think most of what I
5 address in here is the information about the
6 URLs that are attached in those messages.

7 Q. So the -- the URL attachment.

8 A. Yes.

9 Q. What's the difference, in your mind,
10 between an interception and subsequent use?

11 A. That the interception is actually
12 collecting the content and using it as
13 deploying it in some way.

14 Q. What do you mean by "collecting the
15 content"?

16 THE WITNESS: Yeah. Can you read
17 back to me what I -- what my answer just was?
18 Because I was trying to phrase that, and then
19 it all just went out of my head. I --

20 MR. JESSEN: Maybe the court
21 reporter would read it back, her answer
22 beginning with "That the interception."

23 Or if -- you know, I can do it.

24 BY MR. JESSEN:

25 Q. So I asked you: "What's the

1 difference, in your mind, between an
2 interception and subsequent use?"

3 And your answer was: "That the
4 interception is actually collecting the content
5 and using it" -- "using it as deploying it in
6 some way."

7 A. Yeah. That's not the most artful
8 answer there.

9 So the quest- -- just -- just so I'm
10 clear in my head, the question is the
11 difference between intercepting and using?

12 Q. Correct.

13 A. So maybe I can address it the way
14 that I have in the report, and we'll see if
15 that answers your question.

16 Q. Sure.

17 A. So -- actually, let me do it this
18 way. Give me one second.

19 Q. Of course.

20 A. So the way that I presented it
21 here -- because I've separated them out into
22 two different sections. Section 3 is on the
23 interception. Section 4 is on the use. So
24 hopefully that -- this will clarify what I see
25 as the difference.

1 What I've addressed in Section 3 on
2 the interception is basically collecting,
3 logging, storing information about the private
4 message content. And we can talk about the
5 specific things if you want, but that's a
6 general answer.

7 Q. Uh-huh.

8 A. In Section 4 where I'm talking about
9 the use, I'm talking about, once that "dorta"
10 -- once -- once that data was stored, what did
11 Facebook use it for elsewhere in the system.

12 And I talk specifically about how
13 it's used for recommendations and then the
14 social plug-ins. So basically, after the data
15 is stored and collected, what do they do with
16 it.

17 Q. And when -- in that answer when you
18 talk about once the data is stored, you're
19 referring there to persistent storage?

20 A. So it is persistent storage that I'm
21 talking about there. That's a little bit
22 different than the storage question we were
23 discussing before.

24 Q. Right.

25 I'm just -- I just want to

1 understand, when you say -- when you talk about
2 uses of private message content, what you mean
3 by that.

4 And this is -- tell me if I'm wrong,
5 but the distinction you're drawing between the
6 interception and the use is uses refer to
7 things that are done with the private message
8 content after that information is in permanent
9 or persistent storage.

10 A. Which information?

11 Q. The private message content which
12 you're saying is intercepted.

13 A. I -- I don't think -- I'm not sure
14 that we're talking about the same thing.

15 Q. Okay. Help me.

16 A. So -- so I'm not talking about the
17 message being in permanent storage.

18 Q. Okay.

19 A. Right? I'm talking about, in this
20 case, the message is intercepted -- and I don't
21 know. Maybe to get into specifics to help,
22 we're talking about content -- information
23 about that message is logged or otherwise
24 recorded. So not the message itself.

25 Q. Uh-huh.

1 A. But --

2 Q. Okay.

3 A. -- in this case, information about
4 the URLs.

5 Q. Uh-huh.

6 A. The use -- when I'm talking about
7 the use of that information, I'm talking about
8 the use of the data produced from the
9 interception, basically.

10 Q. Uh-huh.

11 A. And that is in storage, the logs
12 that came from the sharing of the messages, the
13 other data that's recorded there.

14 So I don't know if that --

15 Q. Yeah. No.

16 A. Okay.

17 Q. I understand.

18 And that's -- that's in persistent
19 storage?

20 A. I believe that's true, yes.

21 Q. Okay. Okay. Yeah. And don't
22 worry. We'll -- we'll delve into this in -- in
23 a little more detail.

24 Going back to Paragraph 16.

25 A. Uh-huh.

1 Q. One other issue that you have been
2 asked to opine on is whether the class members
3 can be readily determined based on Facebook's
4 own records?

5 A. Yes.

6 Q. Who do you understand to be the
7 proposed class members?

8 A. So my understanding is that it's
9 people since the start of the class period who
10 have sent private message on -- private
11 messages on Facebook with URL attachments.

12 Q. And the start of the class period is
13 December 30th, 2011?

14 A. That's my understand.

15 Q. Two years before the lawsuit was
16 filed?

17 A. Right.

18 Q. To -- do you know when it end --
19 when the class ends, the proposed class?

20 A. I'm not exactly sure, and it may go
21 up to the present.

22 Q. You also have an understanding that
23 it's not just people who have sent private
24 Facebook Messages but also recipients of those
25 messages with URL --

1 A. Oh, yeah. I --

2 Q. -- with URLs?

3 A. I believe that's the case, yes.

4 Q. Okay. Then finally you've been
5 asked to opine on whether the Face- -- whether
6 Facebook's unifor- -- whether Facebook
7 uniformly processed private messages during the
8 relevant period.

9 And what do you mean -- when you
10 talk about the relevant period there, what is
11 that period?

12 A. The class period.

13 Q. Okay. So December 30th, 2011, up to
14 the present day, potentially?

15 A. Potentially.

16 Q. And I know we talked a little bit
17 about this earlier, but do you feel competent
18 to give opinions about Facebook's messaging
19 system after December 2012 to a reasonable
20 degree of computer science certainty?

21 MR. RUDOLPH: Objection. Form.

22 THE WITNESS: I understand the
23 question. I'm -- just give me a second.

24 So I've looked at the code certainly
25 from the beginning of the class period up

1 through the end of the time the source code was
2 provided. So I can speak solidly on that
3 period.

4 I'm left with basically what I've
5 been told, which is that Facebook said that was
6 the code that was relevant for the class
7 period.

8 If that's the case, then -- and --
9 and here we're getting into kind of how I've
10 been informed about the process of this case
11 going, right?

12 So if it's the case that Facebook
13 says the code that's relevant is -- is this
14 code, and it goes through December 30th, 2012,
15 that makes me believe that Facebook thinks
16 there were no relevant changes since that
17 period or else I would have seen that code.

18 I would love to see that code, for
19 what it's worth. But I can't make any certain
20 assertions beyond what I've been able to look
21 at.

22 Q. So it sounds like that's a long way
23 of saying no, which -- which to go back to my
24 question, do you feel competent to give
25 opinions about Facebook's messaging system

1 after December 2012 to a reasonable degree of
2 computer science certainty?

3 MR. RUDOLPH: Objection. Form.
4 Misstates prior testimony.

5 THE WITNESS: So --

6 BY MR. JESSEN:

7 Q. And I -- I -- because we're limited
8 on time, I mean I -- I understand what you've
9 said about what you've been informed and
10 whatnot.

11 I just want to know can -- do you
12 feel comfortable or competent to give me
13 opinions on the messaging system after December
14 2012 to a reasonable degree of computer science
15 certainty?

16 MR. RUDOLPH: Object to form. Asked
17 and answered.

18 THE WITNESS: Yeah. I mean it's --
19 I would like a stronger answer on this
20 question. Like if it's the case that Facebook
21 didn't produce any code after 2012 because they
22 don't think there's any relevant code there,
23 then I would be very certain about this.
24 Facebook doesn't think there's anything
25 interesting for me to see since that point.

1 If there's some other reason that
2 Facebook hasn't produced code since 2012, then
3 I'm kind of left in the dark.

4 So it depends on the answer to this
5 question --

6 BY MR. JESSEN:

7 Q. So --

8 A. -- right? So I've been informed
9 that that's the case, that Facebook said this
10 is all the relevant code. And if that's the
11 case, then I can make that determination.

12 But I feel like there's legal things
13 going on that are -- are different from what I
14 might want to have access to. And -- you know,
15 so based on what I've been told, I'll make that
16 conclusion. If there's other things going on
17 that I don't know about, then -- then I could
18 see there being, you know, a different
19 conclusion potentially to draw starting in
20 2013.

21 I'm -- I really want to answer your
22 question, but I feel like this is -- you know,
23 there's not just science happening in this
24 space in terms of what I've been given access
25 to.

1 Q. Right.

2 So you feel comfortable giving
3 opinions about the operation of Facebook's
4 messaging system after December 2012 only on
5 the assumption that there have not been any
6 material changes since that time; is that fair?

7 A. That's definitely fair.

8 Q. But otherwise, if that weren't
9 correct, then you probably wouldn't feel
10 comfortable doing that.

11 MR. RUDOLPH: Objection. Misstates
12 prior testimony. Asked and answered.

13 THE WITNESS: I would certainly want
14 to see something from 2013 on.

15 BY MR. JESSEN:

16 Q. Uh-huh.

17 A. If -- if I were informed that the
18 Facebook code had substantial changes in the
19 messaging architecture since then, I would like
20 to see the code. I could potentially see other
21 documentation that might stand in place of the
22 code, but I would want more of that information
23 than I have now.

24 Q. Let me ask you this question: There
25 are a number of practices -- and we're going to

1 get into them -- which you describe in your
2 report and -- and say at one point have
3 happened at Facebook.

4 Can you tell me, to a reasonable
5 degree of computer science certainty, whether
6 those things are still happening today?

7 A. So we're talking about the -- the
8 things in the section on use, for example.

9 Q. Yeah.

10 A. I -- I know we'll get into them
11 specifically, but in --

12 Q. Yeah.

13 A. -- Section 4. Yeah, so --

14 Q. We'll get into it in more detail,
15 but I just want to start at a high level.

16 A. Yeah. The answer's no. So I was
17 able to verify, you know, for some of them,
18 2010, 2011, that those practices were
19 happening.

20 Q. Right.

21 A. Have not been able to find yet in
22 the code whether it's still happening or not.
23 And there's evidence that makes me believe it
24 is, but I haven't been able to verify that with
25 any degree of certainty.

1 Q. Okay. Okay. So now let's look at
2 Paragraph 17. These are the opinions -- an
3 overview of the opinions that you're actually
4 offering, correct?

5 A. That looks right.

6 Q. Okay. So we're going to get into A:
7 "The structure and function of Facebook's
8 messaging description is described in detail in
9 Section 3 below." We'll go talk about that.

10 Your second conclusion, B, is:
11 "Facebook intercepted and redirected users'
12 private message content using various
13 code-based devices while the message was in
14 transit, and this interception was not
15 necessary for Facebook to deliver private
16 messages."

17 See that?

18 A. I do.

19 Q. There you -- you use the words both
20 "intercepted" and "redirected."

21 Were you drawing a distinction
22 between those two things, or are they -- are
23 you describing the same -- do they describe the
24 same thing?

25 A. I think I'm describing the same

1 thing there.

2 Q. Part of the conclusion is that
3 Facebook intercepted and redirected users
4 private message content using various
5 code-based devices.

6 A. Uh-huh.

7 Q. What does that mean, "code-based
8 devices"?

9 A. So we discussed devices back up in
10 Paragraph 16. I was asked to give an opinion
11 if there was a device -- in B1 --

12 Q. Uh-huh.

13 A. -- whether and what devices --

14 Q. Right.

15 A. -- Facebook employs. So this is the
16 code that intercepts the messages. That's what
17 the code-based devices are.

18 Q. The Facebook source code.

19 A. Specific parts of the Facebook
20 source code.

21 Q. Uh-huh. Have you ever used the term
22 "code-based devices" in your academic career?

23 A. I don't think so.

24 Q. Why not?

25 A. This is not the kind of thing I

1 study. I don't write about code at all, I
2 don't think, yeah.

3 Q. Why are you using that terminology
4 here "various code-based devices"?

5 A. I don't understand the question.

6 Q. Well, I guess it makes sense -- if
7 you were saying -- if you were describing
8 something that the source code were -- was
9 doing, I could understand that.

10 But why are you referring to
11 portions of the source code, lines of source
12 code as devices?

13 A. So I was asked to give an opinion on
14 whether there were devices that intercepted
15 messages.

16 Q. Right.

17 A. There are things that intercept
18 messages. That's these specific lines of code.
19 And my understanding of "device," as I was
20 asked to give an opinion on, is that these
21 particular lines of code would be that device
22 that's doing the interception.

23 Q. You were -- you were asked to assume
24 that lines of source code could be a device, or
25 you reached that conclusion independently?

1 A. I was not asked to assume anything.
2 I was asked to give an opinion on if Facebook
3 had a device that intercepted messages. I
4 found lines of code that I believe intercept
5 the messages. And so I was asked to give an
6 opinion on a device. Yeah, it seems like that
7 code is the device that does the interception.

8 Q. But you've never referred to source
9 code previously in your academic career as a
10 device, have you?

11 A. That's correct.

12 Q. What is a device?

13 A. It's a thing that does a thing.

14 Q. Okay. Your conclusion C is:
15 "Facebook used the intercepted private message
16 content to provide recommendations to Facebook
17 users and to provide analytics to third-party
18 developers and Web sites as well as increment
19 the Like social plug-in counter."

20 You see that?

21 A. Yes.

22 Q. What do you mean by
23 "recommendations"?

24 A. Suggesting content.

25 Q. What kind of content specifically?

1 A. So I believe in this case we're
2 talking about suggesting URLs that other users
3 would be interested in seeing.

4 Q. And by the way, is it fair to
5 assume -- and again, we'll get into it in more
6 detail.

7 But when you talk about the
8 intercepted private message content, you're
9 talking about the URL attachment?

10 A. I think that's safe, yeah.

11 Q. Okay. You also talk about your
12 conclusion is that Facebook used this content
13 to provide analytics to third-party developers
14 and Web sites.

15 What do you mean by "analytics"?

16 A. Let me just go to that section.

17 Q. Sure.

18 A. So I discuss this -- and I'm sure
19 we'll get there eventually --

20 Q. Yes.

21 A. -- in the section on in- -- the
22 "Insights in Developer API" that provides
23 information about how users are interacting
24 with particular URLs and potentially breakdowns
25 of demographic information based on that

1 activity.

2 Q. None of that information that you're
3 referring to when you talk about analytics is
4 personally identifiable information, is it?

5 A. I don't believe it is.

6 Q. Okay. That would be sort of
7 aggregated, anonymous data?

8 A. In general, I think that's right.
9 I -- you know, I can think of some edge cases
10 that may have ended up being personally
11 identifiable, but that's the exception and not
12 the rule.

13 Q. Okay. You talk about providing
14 analytics to the third-party developers and Web
15 sites.

16 A. Uh-huh.

17 Q. Are you drawing any kind of
18 distinction between third-party developers and
19 Web sites?

20 A. Let me make sure before I --

21 Q. Sure.

22 A. -- answer that.

23 So I don't think I've drawn a
24 distinction here. I think with that section,
25 flipping back through here, I'm -- I'm

1 referring particularly to the API queries.

2 Q. Okay.

3 A. I -- I believe that's what I'm
4 referring to there.

5 Q. And do you understand the API
6 queries to be different than the insights?

7 A. Yes.

8 Q. What's your understanding of the
9 difference between those two things?

10 A. So insights was really a -- I think
11 of it as a dashboard, right? A place you can
12 go look at statistics. The API is just a point
13 at which you can write code to interact with
14 and make queries to Facebook.

15 I don't know that -- there's
16 certainly some overlap in the data that you can
17 get from either. I don't think it's the same,
18 what the data is. But with the insights you
19 need the dashboard, and you -- you're writing
20 code with an API query.

21 Q. And you understand that, with the
22 insights, that was information that was
23 available to the owner of that particular
24 domain?

25 A. That's my understanding of it, yes.

1 Q. Okay. Okay. And then your final
2 two conclusions, which I'm not going to get
3 into in detail now, but we'll -- we'll touch on
4 it a bit: "Class members can be determined
5 from Facebook's own records using various query
6 methods and through self-identification," and,
7 "Facebook source code operated consistently
8 during the relevant period," correct?

9 A. Yes.

10 Q. Do you have any understanding as to
11 the relevance of your conclusions to
12 plaintiffs' motion for class certification?

13 A. I'd I have a high-level
14 understanding.

15 Q. What is it?

16 A. That for class certification -- so
17 am I -- are you asking kind of in general for
18 all of these conclusions?

19 Q. Sure.

20 A. Okay. So that last point, that the
21 class members can be determined, it's my
22 understanding that that speaks to
23 ascertainability, which is necessary for class
24 certification.

25 And the conclusions about

1 intercepting the message with a device in
2 transit, I don't know that that has to do with
3 the class but has to do with whether Facebook
4 is doing what they're accused of doing.

5 I don't understand the -- like all
6 the in-depth legal issues, but I don't know if
7 they'd certify a ascertainable class if they
8 didn't think Facebook was doing anything wrong.
9 So it seems like the two go together.

10 Q. Do you intend to offer any other
11 opinions or conclusions other than those listed
12 in your report?

13 A. Like ever?

14 Q. Well, in this case.

15 A. Okay. I meant that.

16 So my understanding is that
17 discovery is still open. So I think there's a
18 possibility that I may come across new
19 information.

20 Q. Do you have -- you have any other
21 opinions now that you're aware of that you are
22 planning to give that are not reflected in this
23 report?

24 A. Not right now. I don't think so.

25 Q. Okay. Since you finalized your

1 report, have you conducted any additional
2 research or reviewed any additional documents
3 related to this matter?

4 A. We're certainly still reviewing
5 source code, and I've --

6 Q. Right.

7 A. -- been talking to David Cartt --

8 Q. Uh-huh.

9 A. -- and guiding him through what to
10 look at there.

11 I don't believe I've looked at any
12 new documents from Facebook since submitting
13 the report. And I don't know if there have
14 been any.

15 Q. In the course of your review and
16 analysis in this case, have you seen any
17 evidence that Facebook ever -- Facebook ever
18 used URLs shared in private messages to deliver
19 user profiles?

20 MR. RUDOLPH: Objection. Vague.

21 BY MR. JESSEN:

22 Q. Sorry. I meant develop. Develop
23 user profiles.

24 A. Oh. You know, it depends what you
25 mean by a user profile.

1 Q. Well, what do you -- what does that
2 mean to you?

3 A. So I have seen evidence that there's
4 data recorded about specific users and the URLs
5 that they shared in a database.

6 In a way that it could be -- I mean
7 I could actually write the one line of code,
8 having seen the Facebook code, that would allow
9 me to pull up for a user a list of all the URLs
10 that they had shared. I think that
11 legitimately could be called a user profile.

12 I haven't seen that query itself in
13 the Facebook code. But the fact that all that
14 data is there makes me feel like there -- that
15 we're pretty close to having a user profile
16 from the record of those URL attachments.

17 Q. Doesn't Facebook -- I mean Facebook
18 Messages are sitting on Facebook servers,
19 right?

20 A. Yes.

21 Q. So they have all the messages that
22 anyone on Facebook has ever sent, right?

23 MR. RUDOLPH: Objection. Lacks
24 foundation.

25 THE WITNESS: It's my understanding

1 that that's true.

2 BY MR. JESSEN:

3 Q. Do you consider that to be a user
4 profile as well?

5 A. I would not nec- -- no. I don't
6 think I'd consider that to be a user profile.

7 Q. Do you have -- have you seen any
8 evidence that Facebook ever used URLs shared in
9 private messages to develop user profiles for
10 the purpose of deliver -- delivering targeted
11 advertising?

12 MR. RUDOLPH: Objection. Vague.

13 THE WITNESS: Again, depends on your
14 definition of "targeted advertising."

15 Is there a particular kind that
16 you --

17 BY MR. JESSEN:

18 Q. Well, you've studied this. You have
19 some -- what do you understand "targeting
20 advertising" to mean?

21 A. Yeah. I mean we define our own
22 things in research.

23 Q. Right.

24 A. So, you know, I'd say we have, for
25 example, Facebook recommending URLs to people

1 based on data gathered from private message
2 shares. I think that can be considered a form
3 of targeted advertising, that Facebook is
4 advertising these URLs to users.

5 Q. But would --

6 A. I'm not sure if that's what you're
7 asking.

8 Q. Well, no.

9 I mean you actually think that that
10 was -- someone suggesting a URL was a form of
11 advertising?

12 MR. RUDOLPH: Objection. Form.

13 THE WITNESS: I mean academically we
14 totally would count that in the space of --

15 BY MR. JESSEN:

16 Q. Okay.

17 A. -- recommender systems. I mean
18 because you think about it like Amazon
19 recommends you something. It's totally
20 advertising that thing to you.

21 Q. But they're -- they're recommending
22 something that you should buy.

23 A. Yeah. So if -- if you want to
24 restrict this to people buying things. But
25 academically --

1 Q. Well --

2 A. -- we don't make that distinction.

3 Q. -- let's talk -- I mean earlier you
4 talked about a Web site that you developed when
5 you were doing your thesis, and you said there
6 was no advertising.

7 A. Right.

8 Q. But you also said it was making
9 recommendations and ratings.

10 A. But it wasn't --

11 Q. So --

12 A. -- it wasn't doing the
13 recommendations in this way, which -- which I
14 mentioned, right?

15 You could go to a page, and it would
16 tell you how much it thought you would like it.

17 Q. Uh-huh.

18 A. But it wouldn't proactively suggest.
19 That active offering and proactive suggestion,
20 in the literature, the academic space I work
21 in --

22 Q. Right.

23 A. -- is very much the same thing as
24 targeted advertising. So academically I would
25 link those things together.

1 I could see a way that -- that
2 they're distinguished, but I'd want to know how
3 you're considering it.

4 Q. Well, I mean but do you understand
5 advertising is something that's done in order
6 to generate revenue by the entity that's doing
7 the advertising?

8 MR. RUDOLPH: Objection. Form.
9 Lacks foundation.

10 THE WITNESS: So I think that that's
11 a fine definition. I don't think that actually
12 rules out recommended URLs on Facebook as a
13 form of targeted advertising since it's
14 Facebook doing the advertising.

15 BY MR. JESSEN:

16 Q. Have you -- Facebook's doing what
17 advertising?

18 A. If Facebook's recommending URLs to
19 someone, then that's a form of targeted
20 advertising, and Facebook potentially can
21 profit from that by increased engagement.

22 If you have a specific question --

23 Q. Well --

24 A. -- that --

25 Q. Well, I'm just -- you're -- you're

1 starting to give opinions that aren't in your
2 report, which --

3 A. Which I'd love not to do.

4 Q. -- makes me wonder if -- that's part
5 of the reason I went over like are these all
6 your opinions earlier.

7 So let me ask it this way: Do you
8 have any opinion given in this report regarding
9 whether or not Facebook has used URLs shared in
10 private messages to develop user profiles?

11 A. So are you going to ask me that
12 question also about advertising? Because I
13 want to flip through just to remind myself.

14 Q. Yes. I'm going to ask --

15 A. And so I want to look --

16 Q. Yes.

17 A. -- at them both at the same time.

18 Q. Of course.

19 A. All right.

20 Q. Sure.

21 A. I'll do it as quick as I can.

22 Q. Of course.

23 A. So looking through here -- so if I
24 catch it that I've missed it later on, I'll say
25 so. But I don't --

1 Q. Sure.

2 A. -- believe that -- it doesn't look
3 like anywhere I've discussed explicitly user
4 profiles or targeted advertising.

5 Q. Okay. So you're not -- you're not
6 offering an opinion on -- you're not offering
7 any opinion on whether or not Facebook has used
8 private message content, to use your term, to
9 build user profiles or serve target
10 advertisements, correct?

11 A. So I have no opinions that
12 explicitly use those terms here.

13 Q. But do you have opinions that you
14 think fall under that umbrella?

15 A. I mean it's the discussion that we
16 were just having. So I wasn't -- I wasn't
17 asked to offer an opinion on specifically -- I
18 mean I don't think it says like, "Is there a
19 user profile created? Is there targeted
20 advertising" --

21 Q. Okay.

22 A. -- "done?" right?

23 Q. You weren't --

24 A. So I --

25 Q. -- asked to offer an opinion on

1 that.

2 A. I don't believe so.

3 Q. Earlier you mentioned, when you were
4 talking about the different parts of
5 Facebook -- "What is Facebook?" I asked you,
6 and you said --

7 A. Uh-huh.

8 Q. -- there was a -- there was a part
9 of it that had a -- you said -- you mentioned
10 an advertising component.

11 And when I talk about targeted
12 advertising, that's really what I'm talking
13 about --

14 A. Okay.

15 Q. -- the advertising components of
16 Facebook as discussed by you earlier.

17 And I guess my question is do you
18 have any evidence that URLs shared in private
19 messages were ever used in connection with that
20 advertising component?

21 MR. RUDOLPH: Objection. Form.

22 THE WITNESS: So from what I've
23 seen, I don't have any evidence that -- that
24 those URL shares were used for that kind of
25 targeted advertising.

1 BY MR. JESSEN:

2 Q. You -- you -- okay.

3 You have information that some
4 shares were used for recommendations but not
5 for that kind of target advertising.

6 A. That's right.

7 Q. Okay. Okay. Let's look at
8 Paragraph 19. And this is under the section of
9 your report titled "Facebook's Interception of
10 Private Message Content." And you initially
11 talk about Facebook's private message
12 architecture or functionality. In here you're
13 providing an overview of Facebook's private
14 message architecture.

15 Paragraph 19 you're -- and you're
16 describing sort of what happens when someone
17 types a URL into a private message.

18 You say: "She types her text, and
19 if she types, pastes or otherwise enters a URL
20 into the body of the message, Facebook detects
21 the URL as she types. Once it sees a URL, it
22 extracts the URL from the message and sends it
23 to Facebook servers."

24 See that?

25 A. I do.

1 Q. Are you claiming that that process
2 is a -- an interception or redirection of
3 private message content?

4 A. Yes. I know I have a specific
5 statement about this in here that I just want
6 to look up. Well, we'll probably get there.

7 Q. Sure.

8 A. Okay. But no. So I'm not claiming
9 that this particular part of the process,
10 basically putting that preview into the message
11 before I send it, I'm not claiming that that's
12 the interception.

13 Q. Okay. Why not?

14 MR. RUDOLPH: Objection. Form.

15 THE WITNESS: That's a really
16 complicated question.

17 Are you asking me to list why it
18 wouldn't count?

19 BY MR. JESSEN:

20 Q. Well, why don't -- I guess you're --
21 why don't you think that's an interception or
22 redirection?

23 A. It potentially could be an
24 interception. I -- so -- so this is an issue
25 that I've thought a little about. But again,

1 like it's getting into legal things that I
2 don't have a full grasp of.

3 Can there be a perfectly allowable
4 interception? Does it count as an interception
5 if it's like totally allowed under every law?
6 That's a kind of legal question, right? I feel
7 like that's actually the nature of what you're
8 asking me. Like --

9 Q. We can move on.

10 A. Okay. I'm not --

11 Q. And --

12 A. -- trying to be difficult. I just
13 --

14 Q. No, no, no.

15 A. -- know that --

16 Q. No. I just -- it's okay.

17 A. Okay.

18 Q. Let's move on.

19 Okay. Then you drop a footnote at
20 the end of Paragraph 19, Footnote 3, which
21 says: "Facebook servers are the computers on
22 which the Facebook system operates. They store
23 code and data, run the code, provide Web
24 content and manage back-end functionality.
25 Essentially every part of Facebook, other than

1 the code that runs in the user's browser, is
2 running on Facebook servers, and those servers
3 provide every element of Facebook that a user
4 interacts with."

5 Did I read that correctly?

6 A. That looks right.

7 Q. You would agree with me that those
8 servers -- those Facebook servers are necessary
9 to the operation of Facebook's messaging
10 system?

11 A. Yes.

12 Q. You talk a little bit about
13 JavaScript in some of your paragraphs, and I'm
14 not going to get into too much detail, but one
15 of the points you make is that most -- a high
16 percentage of users -- Internet users have
17 JavaScript enabled?

18 A. Yes.

19 Q. Would you agree with me that, even
20 if the total percentage is only 1 to 2, which
21 some of the -- some of the things here -- you
22 cite in Paragraph 21 say, that that's still
23 millions and millions of people --

24 MR. RUDOLPH: Objection. Form.

25 BY MR. JESSEN:

1 Q. -- running browsers that don't have
2 JavaScript enabled?

3 MR. RUDOLPH: Objection. Form.

4 THE WITNESS: Are we talking in the
5 U.S. or worldwide?

6 BY MR. JESSEN:

7 Q. In the U.S.

8 A. It gets you to about a million, I
9 think, right, if we're doing 1 percent of like
10 how many computers are there. Is there one per
11 person?

12 Q. All right. We can look at the
13 article, but I -- given the time constraint...

14 A. Okay.

15 Q. It's a lot of people.

16 A. A lot.

17 Q. Okay. In Paragraph 22 you talk
18 about -- you say: "The URL detection process
19 is also described by ██████, an engineer at
20 Facebook. In his September 25th, 2015
21 deposition, ██████ states, 'When the user types
22 in a URL, the client-side code -- well, this is
23 the JavaScript -- running on the user's
24 browser, would defect that the entered a URL
25 and will attempt to create an attachment for

1 them to sends.'" "

2 Do you see that?

3 A. I do.

4 Q. And then in Paragraph 23 you say,
5 based upon your analysis of Facebook source
6 code, the process appears in certain files,
7 right?

8 A. Yes.

9 Q. And I just want to confirm -- this
10 tracks what we were saying earlier -- that
11 process there, you're not saying that's the
12 interception, correct?

13 A. That's correct.

14 Q. Paragraph 24 you say: "After this
15 code detects that Alice has typed a URL in her
16 private message, a request is sent to Facebook
17 servers to retrieve information" to -- "related
18 to the URL. One of the purposes of retrieving
19 this information is to create a URL preview
20 within the private message. Facebook describes
21 the preview as a," quote, "brief description of
22 the URL and, if available, a relevant image
23 from the Web," end quote.

24 What did you mean in the second
25 sentence where you say one of the purposes of

1 retrieving this information is to create a URL
2 preview?

3 A. Like what are the other purposes?

4 Q. Yeah.

5 A. So if it's the first time that a
6 user has entered a URL, if Facebook has never
7 seen that URL before --

8 Q. Right.

9 A. They create other data -- they have
10 data structures in the back end -- about that
11 URL that has information beyond what's included
12 in the preview, for example.

13 Q. Are you referring to the global
14 share object?

15 A. The global share object. Right.
16 But that gets created if a -- if Facebook sees
17 a URL for the first time. And there's
18 information in that object beyond just what
19 appears in the preview.

20 Q. Well, what other information?

21 A. There's a lot. It has -- so in --
22 are you asking me in general what's in those
23 global --

24 Q. Yeah.

25 A. -- shared objects.

1 Q. I mean if you know.

2 A. Yeah. I think they contain some
3 information about when that URL was crawled for
4 the first time. They can contain the Facebook
5 user ID of the person who created -- who
6 initiated that call.

7 Some of them have lists of user IDs
8 of people who have shared that later on. So
9 that obviously wouldn't be there on the first
10 time it's accessed. But that is recorded in
11 that data structure.

12 But the -- if you print it out,
13 there's pages of information that's contained
14 there.

15 Q. Uh-huh.

16 A. Those are the kind of humanly
17 understandable ones that I remember off the top
18 of my head.

19 Q. But do you understand that the
20 purpose of the global share object is to
21 generate a URL preview? The primary purpose.

22 A. I -- I don't understand that.

23 Q. Okay. Why not?

24 I mean do you disagree with that, or
25 do you just not have a basis for knowing one

1 way or the other?

2 A. I think the latter. So I agree --

3 Q. Okay.

4 A. -- that it's used for that preview.
5 I just don't know if that's its primary purpose
6 within Facebook.

7 Q. You go on to say in Paragraph 25:
8 "The process of detecting the URL within a
9 private message, executing code to find
10 information about the URL and then processing
11 that information analysis message window
12 employs what Facebook refers to as a share
13 scraper or scraper."

14 You see that?

15 A. I do.

16 Q. Are you familiar with the term
17 "share scraper" or "scraper"?

18 A. I am.

19 Q. You've heard those before? Those --
20 you've heard those terms before?

21 A. I have.

22 Q. What do you understand them to mean?

23 A. So within the Facebook context or
24 general?

25 Q. Both.

1 A. So "scraper" is a term widely used
2 in -- in this kind of context on the Web where
3 you go out to a page, and you have code that
4 basically processes the content of that page to
5 extract some information. So we call that
6 scraping the page.

7 Q. Uh-huh.

8 A. "Share scraper" I think is a term
9 I've only seen in the Facebook context
10 specifically. And that's used in their code to
11 describe this process.

12 Q. The term "scraper" or "scraping,"
13 that doesn't have a pernicious meaning, does
14 it?

15 MR. RUDOLPH: Objection. Vague.
16 Form.

17 BY MR. JESSEN:

18 Q. And what I mean by that is it's
19 describing a process of gathering information
20 from a Web site.

21 It's -- is there something sinister
22 about scraping?

23 MR. RUDOLPH: Objection. Form.
24 Vague.

25 THE WITNESS: Yeah. I would say, in

1 general, no, that it's not generally considered
2 sinister.

3 BY MR. JESSEN:

4 Q. Okay. And then in Footnote 10 you
5 say: "The share scraper is analogous to the
6 Web crawler referenced in Plaintiff's
7 consolidated amended complaint."

8 You see that?

9 A. I do.

10 Q. And there you're referring to the
11 Facebook share scraper when you say the, quote,
12 share scraper?

13 A. Yes.

14 Q. Okay. What is a Web crawler?

15 A. Basically the same thing. It's a
16 piece of code that goes to a Web site and reads
17 the code for that page and extracts some
18 data --

19 Q. Uh-huh.

20 A. -- to be used.

21 Q. And in this case, the share scraper
22 or the Web crawler is being used to generate a
23 preview -- a URL preview?

24 A. Well, it's used to create that
25 global share object, which --

1 Q. Right.

2 A. -- in turn, will create --

3 Q. Got it.

4 A. -- the preview.

5 Q. The preview.

6 And this happens before the message
7 is sent, correct?

8 A. That's correct.

9 Q. You have any understanding about
10 whether this process of scraping is used across
11 Facebook's Web site?

12 For example, if I put a -- if I type
13 a URL into a post on my timeline or my wall,
14 you understand that the same processes are in
15 place to generate the URL preview?

16 A. Yes.

17 MR. JESSEN: Okay. I think we've
18 been going a little over an hour.

19 Do you guys want to take a break?

20 THE WITNESS: Great.

21 MR. RUDOLPH: Okay.

22 THE VIDEOGRAPHER: Off the record at
23 2:53.

24 (A short recess was taken.)

25 THE VIDEOGRAPHER: On the record at

1 3:15.

2 BY MR. JESSEN:

3 Q. Let's take a look at Paragraph 28 in
4 your report. Right above Paragraph 28 is a
5 depiction of a preview in a message window.

6 Would you agree with that?

7 A. Yes.

8 Q. And in Paragraph 28 you say:

9 "However, this preview analysis message is not
10 the only result of the data structure created
11 by Facebook's code. The preview returned is
12 actually part of an attachment to the message
13 so that, while a preview is rendered visually
14 in Alice's message window, this attachment is
15 separate and distinct from the message itself."

16 Did I read that correctly?

17 A. Yes.

18 Q. The first sentence, what do you mean
19 by that?

20 What do you mean when you say:

21 "This preview analysis message is not the only
22 result of the data structure created by
23 Facebook's code"?

24 A. I think -- I think what I'm
25 referring to there is that, in addition to this

1 preview, there's also that global share object
2 that we were talking about before --

3 Q. Uh-huh.

4 A. -- the break.

5 Q. Uh-huh. Okay. So it's your
6 understanding that the URL attachment to the
7 message is separate and distinct from the
8 message itself, correct?

9 A. I'm -- I'm sorry. Can you just
10 repeat that?

11 Q. Yeah.

12 A. I was looking at that last sentence
13 there.

14 Q. Sorry. I was just reading from
15 that.

16 It's your understanding -- or the
17 report says the URL attachment to the message
18 is separate and distinct in the message itself?

19 A. Let -- let me just review that.

20 Q. Sure.

21 A. The language is kind of flying out
22 of my head.

23 Q. No worries.

24 A. Right. So I think that is referring
25 to -- there's the message itself. I think

1 that's referring to the text of the message
2 that I send, which can still have that URL in
3 it --

4 Q. Uh-huh.

5 A. -- but I don't think it has to.

6 Q. Uh-huh.

7 A. And then there's this distinct
8 attachment.

9 Q. Okay. Then in Paragraph 30, just
10 skipping ahead, that -- you say: "When Alice
11 finishes the message and hits send, both the
12 text of her message and the URL attachment are
13 sent to Facebook's servers," right?

14 A. I do.

15 Q. Would the URL attachment always be
16 sent with the -- with the text of the message?

17 A. If there is an attachment --

18 Q. Yes.

19 A. -- then, yeah, I believe, when Alice
20 hits send, both of them always get sent,
21 assuming everything functions the way it's
22 supposed to.

23 Q. And assuming the user doesn't delete
24 the URL attachment?

25 A. Well, right. So if the attachment

1 exists, it's sent. If the user deletes it,
2 then it's not there to be sent.

3 Q. Right.

4 Moving back up to Paragraph 29, you
5 say: "As described in further detail below,
6 Facebook has pulled data related to this URL
7 from a global share object, which is a data
8 structure that Facebook uses to track its
9 users' interaction with URLs across the Web."

10 What is the basis for your statement
11 that a global share object is a data structure
12 that Facebook uses to track its users'
13 interactions with URLs across the Web?

14 A. Which part of that?

15 Q. Track its users' across -- track its
16 users' interactions with URLs across the -- the
17 -- the Web.

18 A. So I've -- so I've looked at those
19 global share objects. I've looked at outputs
20 of those.

21 Q. Right.

22 A. And, you know, also looked at code
23 dealing with them. And they have, you know, a
24 number of fields that are used exactly for that
25 purpose, to track how Facebook users are

1 interacting with the URL represented in that
2 object.

3 Q. What field are you referring to?

4 A. So as I mentioned when we were
5 talking about this before, you know, not having
6 it in front of me, I do recall that some of
7 those have a Facebook ID of the creator, and
8 some of those global share objects also had
9 lists of IDs of users who had shared the
10 object.

11 In addition to that, there are a
12 number of fields tracking how often the URL has
13 been shared, posted, clicked and liked.
14 There's a number of those aggregate scores.

15 Q. Are you referring -- we're going to
16 get to this -- but to the field that's -- I
17 think it's called tracking into?

18 A. Yes.

19 Q. Okay. Now, it's -- it's my
20 understanding that's one field.

21 But is that --

22 A. It's one field, but it has five
23 values within it that --

24 Q. Sure.

25 A. -- represent five different metrics

1 that --

2 Q. Right.

3 A. -- were tracked.

4 Q. Right.

5 You mentioned that the global share
6 object might have a list of IDs of users who
7 had shared it.

8 And would that include Facebook IDs
9 of users who had shared a URL in a private
10 message?

11 A. So my impression is not. I
12 haven't -- I don't believe I've tracked this in
13 the code. I've actually looked at the output
14 of those global share objects.

15 And, you know, I don't have that
16 here in the reports. So the details aren't
17 just right at hand for me. But I believe it's
18 the case that that list is only people who have
19 posted it in a more public forum.

20 Q. And again, with respect to Paragraph
21 29, you're talking about how the preview is
22 generated. You say: "As described in
23 further" -- "further detail below, Facebook has
24 pulled data related to this URL from a global
25 share object."

1 Why is Facebook pulling data from
2 the global share object, based on your
3 understanding?

4 A. Why did they go to the global share
5 object to create that preview?

6 Q. Yes.

7 A. So it -- so my understanding is that
8 it's both faster than rescraping the URL every
9 time and that it gives a consistent experience.

10 So for -- I think like for a while,
11 when a new URL comes in, a user's able to edit
12 the title or the description. But after a
13 while, that ability goes away, so everybody
14 seeing that URL gets the same preview.

15 Q. Would pulling -- would Facebook
16 pulling data to generate the preview from the
17 global share object also possibly help avoid
18 crashing certain Web sites by avoiding
19 requesting data from the -- from those sites
20 too many times?

21 MR. RUDOLPH: Objection. Form.
22 Lacks foundation. Incomplete hypothetical.

23 THE WITNESS: It's possible.

24 BY MR. JESSEN:

25 Q. And is it your understanding that,

1 if a user included a URL in a private message,
2 Facebook was always able to detect that URL and
3 create a URL preview to attach to the message?

4 A. I'm sorry. Repeat that question,
5 please.

6 Q. Yeah.

7 Is it -- was it always the case --
8 or is it always the case that, if a user types
9 a URL into a private message, that Facebook is
10 able to detect the -- detect that URL and then
11 use that to create a URL preview?

12 A. If the user has JavaScript enabled
13 and, you know, the network's all functioning
14 correctly, I think it's -- it's always the
15 case, yeah.

16 Q. Do you know if -- what would happen
17 if that -- if the URL is on a URL blacklist?

18 A. So I know Facebook will check
19 against some of those blacklists for malicious
20 URLs. I don't remem- -- I don't remember
21 exactly what appears.

22 You know, I've looked at -- I've
23 seen that happen now. There was just a new
24 story about that, and I tested it.

25 I think now what it does is say

1 "Unable to create attachment," or something
2 like that.

3 Q. Uh-huh.

4 A. I didn't look into that going back.

5 MR. JESSEN: And one thing I will
6 do -- I should have done this earlier -- we are
7 designating this transcript highly
8 confidential, attorneys' eyes only. I think
9 parts of it discuss source code as well.

10 So that's for the court reporter.

11 BY MR. JESSEN:

12 Q. Okay. Okay. Let's go ahead and
13 take a look at Paragraph 32.

14 And this is in the section of your
15 report "Facebook's Interception and Logging of
16 Private Message Content, Creation of Share
17 Objects."

18 In Paragraph 32 you say: "Facebook
19 has large and complex data behind its site.
20 They store this in a data model called TAO, The
21 Associations and Objects. As the name
22 suggests, there are two pieces in this model,
23 objects and associations."

24 Did I read that correctly?

25 A. Yes.

1 Q. Is it your understanding that all
2 Facebook data objects and associations are
3 stored in TAO?

4 A. That all objects and associations
5 are stored in TAO?

6 Q. Sure.

7 A. That's my understanding.

8 Q. And what do you -- what's your basis
9 for that?

10 A. Having read documents from Facebook
11 itself on -- on how they're storing that data,
12 which I have cited there. Also looking at the
13 code, there seems to be this connection between
14 TAO and the objects and associations that I've
15 looked at.

16 Q. Do you -- are there some objects --
17 I mean does -- is it possible Facebook creates
18 some objects that are not stored in TAO?

19 A. I -- I think it's definitely the
20 case that there's some data that's not stored
21 in TAO. You know, to -- when you're storing
22 data, what you call an object and not, like
23 that becomes a very kind of fuzzy space.

24 So there -- we've def- -- I've
25 definitely seen data that's not stored in TAO

1 on Facebook.

2 Q. Uh-huh.

3 A. We can probe more deeply if it's an
4 object if you want.

5 Q. Sure.

6 Paragraph 33 you say: "Objects
7 represent things on Facebook, users' pages,
8 check-ins, comments, locations, et cetera.
9 Associations represent the relationships
10 between objects. Those could be friendships
11 between users, a like that connects a user to a
12 page or a location that is tied to a user
13 check-in."

14 Do you see that?

15 A. Uh-huh. Yes.

16 Q. And we talked a little bit earlier
17 about objects in the context of object-oriented
18 programming.

19 Do you --

20 A. Yes.

21 Q. -- remember that?

22 And creation of an object in
23 object-oriented programming is not something
24 that's unusual, is it?

25 A. So these are not object-oriented --

1 MR. RUDOLPH: Objection. Vague.
2 Form.

3 THE WITNESS: These are hot
4 object-oriented programming objects that we're
5 talking about here.

6 BY MR. JESSEN:

7 Q. What's your basis for saying that?

8 A. Well, object-oriented programming
9 objects are objects that exist in code as it's
10 being executed, not data that's stored
11 somewhere.

12 Q. So this is data being stored
13 somewhere?

14 A. TAO is a -- a data storage system.

15 Q. Uh-huh.

16 A. So it's -- TAO object is not an
17 object-oriented programming language object.

18 Q. So this is a different -- when you
19 talk about these kind of objects, object
20 represent things, you would draw a distinction
21 between those kinds of objects and objects
22 that's are used in object-oriented programming?

23 A. There's -- there's definitely a
24 difference. Objects in both cases represent
25 things.

1 Q. Uh-huh.

2 A. But objects in an object-oriented
3 programming context --

4 Q. Yeah.

5 A. -- are -- if we're going to get
6 technical on it, are instantiations of classes.

7 Q. Right.

8 A. And a class is something that you
9 define in your code. It has a name. It has
10 associated data points, attributes of that
11 class, and associated methods or functions.

12 So to -- to kind of give a simple
13 example, I could create a class in
14 object-oriented programming for a dog, right?
15 And the dog has a --

16 Q. Uh-huh.

17 A. -- a birthday and a name and a
18 color. Those are the attributes. And then
19 there's methods, things the dog can do. It
20 could sleep, and it could eat, and it could
21 walk and whatever else.

22 So that's a -- a generic concept of
23 what an object would be. And then you
24 instantiate that. So I'll make a particular
25 dog named Rex in object oriented programming.

1 And that's a -- just a different
2 thing than if a have a -- a data store
3 somewhere that also represents data as object.
4 They're just technically different concepts.

5 Q. Uh-huh. Okay. In Paragraph 34 you
6 say: "There are a number of objects that
7 Facebook creates in the process of scanning
8 private messages that include URLs."

9 You see that?

10 A. I do.

11 Q. What do you mean by the word
12 "scanning"?

13 A. So I mean looking at what's in
14 private messages that include URLs. And in
15 this case we're looking at the URL attachment.

16 Q. So Facebook is looking in -- looking
17 in the URL attachment?

18 A. Facebook code is looking at the URL
19 attachment, yes.

20 Q. Is that unusual?

21 A. Compared to what?

22 Q. Anything.

23 Is it an unusual process for
24 Facebook code to be looking at an attachment
25 that is being sent with a -- with a message?

1 MR. RUDOLPH: Objection. Form.
2 Vague.

3 THE WITNESS: I mean Facebook does
4 it for all messages.

5 I don't think that's the question
6 you're asking, but I -- I don't understand what
7 you want me to compare this to.

8 BY MR. JESSEN:

9 Q. Well, I asked you what you meant by
10 the word "scanning," and you said that's
11 looking at what's in private messages that
12 included URLs. And in this case, we're looking
13 at the URL attachment.

14 And I'm just trying to understand
15 what you were saying, what you meant by that.
16 I mean you said Facebook code is looking at the
17 URL attachment.

18 But is that different than
19 looking -- looking at the attachment -- or in
20 the attachment, rather?

21 A. I don't think that there's a
22 substantive difference --

23 Q. Okay.

24 A. -- "at" or "in."

25 Q. Earlier you said that an

1 interception was -- involved collecting
2 content.

3 And you distinguished that from a
4 use, which I think you said -- might have said
5 was deploying that content. Something along
6 those lines.

7 When you said an interception
8 involved collecting content, collecting it from
9 where?

10 A. So in this case, it's -- so the
11 interception involves both collecting and
12 redirection. So in this case, we're talking
13 about collecting information that's in that URL
14 attachment and then redirecting it to code that
15 then operates on it.

16 Q. And by redirecting it to code, what
17 does that -- what does that mean?

18 A. Taking the information about the
19 message and the URL attachment and directing
20 that to code that is not part of the message
21 delivery process.

22 Q. Okay. If part of the interception
23 is collecting the content, I guess -- sorry if
24 my question was inartful -- but from where is
25 Facebook collecting the content?

1 A. From the private message.

2 Q. And where is the private message --
3 where is it residing when this happens?

4 MR. RUDOLPH: Objection. Form.
5 Vague.

6 THE WITNESS: I'm not quite sure
7 what you're asking.

8 BY MR. JESSEN:

9 Q. Is it on a Facebook server? Is it
10 somewhere else?

11 A. It is -- it has been sent to the
12 Facebook server.

13 Q. All right. So it's actually on the
14 Facebook server when that happens.

15 A. Right. As opposed to on the user's
16 computer.

17 Q. Uh-huh. Okay. You go on to say --
18 after you say there are a number of objects
19 that Facebook creates in the process of
20 scanning the private messages that include
21 URLs: "Two of these are user URL share objects
22 and global URL share objects. The user URL
23 share object contains details about the
24 specific user's interaction with the given URL;
25 while the global URL share object contains

1 information related to all the interactions
2 between Facebook users and a given URL."

3 See that?

4 A. I do.

5 Q. Do you consider the creation of
6 these two objects -- these two share objects to
7 be unlawful?

8 MR. RUDOLPH: Objection. Calls for
9 legal conclusion.

10 THE WITNESS: Yeah. I have a hard
11 time with the -- yeah. I have a hard time
12 offering an opinion on whether it's legal or
13 not.

14 BY MR. JESSEN:

15 Q. Uh-huh. Why is that?

16 A. I am not an expert on this law at
17 all. You know, I -- I have a -- a basic
18 understanding of the law and what I've been
19 asked to opine on in a technical sense. But I
20 haven't read this law and definitely not an
21 expert on it.

22 Q. Do you find it unusual or surprising
23 that Facebook is creating a share object once
24 the URL attachment reaches a Facebook server?

25 MR. RUDOLPH: Objection. Form.

1 Vague.

2 THE WITNESS: A user share object or
3 a global share object?

4 BY MR. JESSEN:

5 Q. Just -- sorry. When I say just -- I
6 think of it as global share object, which is
7 the canonical representation of the URL, and
8 then just a share object, which would be an
9 individual share.

10 A. Okay.

11 Q. So -- but -- I'm going to ask you
12 about both.

13 But is it unusual that they are
14 creating a -- you call it a user share
15 object -- but the share object that represents
16 that particular share of the URL attachment?

17 MR. RUDOLPH: Objection. Form.

18 Vague.

19 THE WITNESS: And you're -- you're
20 talking about in a private message?

21 BY MR. JESSEN:

22 Q. Yes.

23 A. I was very surprised by that.

24 Q. Why is that?

25 A. You know, just like if I'm sending a

1 -- if I'm posting something generally, it
2 doesn't surprise me if I'm sharing it publicly.
3 If I'm sending a private message, I think of
4 that much more like texting where Facebook is
5 just facilitating the delivery.

6 So I was very surprised at the fact
7 that they were creating metadata in a way
8 that's totally unnecessary for that message to
9 get delivered when I sent a private message.

10 Q. Would you consider the user share
11 object to be metadata?

12 A. This is another gray area, but I'd
13 say it definitely has metadata in it.

14 Q. What about the creation of the
15 global share object; was that surprising to
16 you?

17 A. The -- the actual creation of the
18 global share object, you know, which occurs
19 when I type in that URL the first time, not
20 actually on the send, that I didn't find
21 specifically surprising that there would be
22 a -- a canonical representation of a URL within
23 Facebook.

24 I was surprised at what was being
25 tracked there in the tracking info from private

1 messages for largely the same reasons.

2 Q. What do you mean by that, what was
3 being tracked there in the tracking into?

4 A. That the fact that I had shared a
5 URL with someone over a private message was
6 aggregated into public information, displayed
7 as Likes about that URL. I -- I found that
8 very surprising.

9 Q. That it was part of an aggregate --
10 aggregated information?

11 A. Yes.

12 Q. You're not saying that it was -- in
13 the global share object, someone could tell
14 that you had shared a particular URL in a
15 private message, are you?

16 A. That's correct.

17 Q. You're just saying the counter went
18 up.

19 A. Yes.

20 Q. And then for a period of time when
21 the Like button social plug-in included
22 messages -- message shares, that that went up
23 as well.

24 A. Right.

25 Q. Okay. So if I've got -- let me --

1 let me see if I understand.

2 You're not saying the creation of a
3 global share object is an interception,
4 correct?

5 MR. RUDOLPH: Objection. Form.
6 Calls for legal conclusion.

7 THE WITNESS: You know, when we --
8 we talked about this before, I have this sort
9 of struggling with my understanding of -- of
10 the law and if you can have a legal
11 interception.

12 It's certainly not the interception
13 that I'm talking about here.

14 BY MR. JESSEN:

15 Q. Understood.

16 Are you saying, however, that the
17 creation of a user -- user share object
18 representing that particular share does
19 constitute an interception?

20 A. I am.

21 Q. Okay. Would your answer be the same
22 for a share object created from a URL
23 attachment in a public post?

24 A. I don't know. I would just have to
25 think a lot more about all of the technical

1 things surrounding that. It's just such a
2 different context.

3 Q. You understand that the technical
4 aspects of it, though, are the same, right?

5 MR. RUDOLPH: Objection. Form.
6 Lacks foundation.

7 THE WITNESS: The technical aspects
8 of creating a user share object in a post for a
9 URL attachment?

10 BY MR. JESSEN:

11 Q. Yes.

12 A. Yeah. My understanding is that
13 that's basically the same.

14 Q. So you consider it to be an
15 interception in the context of private
16 messages, but you're not sure if it would be an
17 interception in the context of a post.

18 A. Correct.

19 Q. And you don't -- why?

20 Why -- why are the reasons for the
21 distinction?

22 A. One is a direct message from one
23 person to another. It's intended to be
24 private. We call them private messages.

25 The other is a broadcast. And so,

1 you know, it gets, again, to the legal issues,
2 which, you know, I'm not an expert on.

3 Is it -- is it possible to have like
4 a wiretapped intercept of a broadcast post?

5 I -- I mean I haven't thought at all in depth
6 about what that would mean. I probably have
7 lots of questions about the legal issues
8 surrounding it. So I just don't know.

9 Q. Well, earlier I think you said that
10 you considered an interception to be a -- and
11 I'm not trying to misstate your testimony. So
12 correct me if I get it wrong -- an interception
13 to be a collection of message content that was
14 not necessary to facilitate delivery of the
15 message.

16 A. I -- I think that's accurate.

17 Q. So by that same -- is a -- is a
18 share object necessary to facilitate delivery
19 of a public post?

20 MR. RUDOLPH: Objection. Form.

21 THE WITNESS: I don't know. I
22 haven't looked at depth of that issue.

23 BY MR. JESSEN:

24 Q. Do you understand that the -- that
25 the -- in the context of private messages, as

1 well as public posts, that the share object is
2 necessary to render the URL attachment to the
3 recipient of the message?

4 MR. RUDOLPH: Objection. Vague.

5 THE WITNESS: That depends what you
6 mean by -- actually -- so you're saying that
7 the UR -- the user URL share object, you're
8 asking if that is necessary to render preview
9 rather than the global share object?

10 BY MR. JESSEN:

11 Q. I'm not drawing necessarily a
12 distinction between those two at the moment.
13 But I mean I think we discussed earlier and
14 your report discusses this, that the -- the --
15 the global share object is used to generate
16 that URL preview, which becomes an attachment
17 to the message and then is sent to a Facebook
18 server, at which point the user-specific share
19 object is created.

20 And so I'm really focused on that
21 user -- are you aware of the fact that a user
22 share object is necessary to render the
23 attachment to the recipient of the message?

24 MR. RUDOLPH: Objection. Lacks
25 foundation.

1 THE WITNESS: I don't believe that's
2 true.

3 BY MR. JESSEN:

4 Q. Why do you say that?

5 A. For so many reasons. So one is that
6 -- so that preview basically has three
7 elements, that attachment preview that comes
8 up.

9 Q. Uh-huh.

10 A. Let's say four. It has an image.
11 It has a title. It has a description. And it
12 has a link that you can click on it to go to
13 the Web site.

14 Q. Okay.

15 A. There's lots of ways that that
16 preview can be rendered. And, for example, if
17 you look at the Facebook messaging code on the
18 desktop as it exists now, for example, if you
19 look at what gets sent to Facebook from the
20 browser -- like if I start typing a message, it
21 has an attachment, I click send, it actually
22 sends a JSON object, J-S-O-N, from my browser
23 to Facebook that has all of that data
24 explicitly encoded in it already.

25 Q. Uh-huh.

1 A. It's not just a reference to the
2 global share object, though I think that's in
3 there. It has the title and the photo and the
4 description and the link in the data that's
5 sent from my browser back to Facebook.

6 So Facebook receives that. If I'm
7 sending a message to you, they can deliver that
8 message to you. It has that JSON-encode
9 attachment already and could simply display
10 that information to you in the preview format,
11 which is actually how it's rendered in the
12 browser, requiring no intermediate interaction
13 with any objects between the sending and the
14 delivery.

15 Q. So -- okay. So you're saying --
16 you're saying there are or ways that you could
17 do it.

18 But do you know if the way that the
19 system is actually built, the Facebook
20 messaging system, that the way that it's set up
21 is the share object -- the user share object is
22 created to render the preview to the recipient?

23 A. That is not how I understand that it
24 works.

25 Q. Why do you say that?

1 A. So the rendering of the attachment
2 on the recipient side is -- so it's client-side
3 code running in the recipient's browser that
4 processes formatted data that Facebook sends
5 down to represent that attachment.

6 Those objects, necessary or not, are
7 never sent as, say, PHP objects to the client
8 side. There's just data about them that's
9 sent. So it's not necessary to have an object
10 for the client -- the recipient's client-side
11 system to render that preview, which is just a
12 little HTML object in the window.

13 Q. But what about storing it -- on the
14 other part of it is coming back and being able
15 to access the preview -- if you go back to your
16 inbox, say, after you've done it for -- you've
17 been away from it for a week or two, go back,
18 and you can look, do you have an understanding
19 as to the role of a share -- the user-specific
20 share object place in allowing a person to do
21 that?

22 A. Are you asking how is that used or
23 is it necessary?

24 Q. How is it used in the actual
25 implementation of the Facebook messaging

1 system?

2 Like does the -- does the
3 user-specific share object allow that to
4 happen?

5 MR. RUDOLPH: Objection. Form.
6 Vague.

7 THE WITNESS: Yeah. I'm not sure
8 how much detail I have on that in here. Give
9 me just a quick second --

10 BY MR. JESSEN:

11 Q. Sure.

12 A. -- to flip it.

13 Yeah. So I don't think I have
14 anything in here that's looking at the
15 rendering for the recipient of that preview.

16 Is it the case that Facebook
17 references that user share object?
18 Potentially. Is it necessary? Absolutely not.

19 Q. Meaning -- meaning you could -- that
20 you could envision other implementations of it.

21 A. Many.

22 Q. Do you know if the user-specific
23 share object allows a Facebook user to go back
24 and into their messages folder and see the --
25 see the URL attachment in the future?

1 MR. RUDOLPH: Objection. Form.

2 Asked and answered.

3 THE WITNESS: Yeah. I -- so I have
4 nothing in the report about that. And off the
5 top of my head, I don't remember look at the --
6 looking at the messaging code for how the
7 message was received.

8 I know that the rendering -- the
9 actual rendering in the client side just uses
10 data that's sent. It doesn't require the

11 object. But I'm unaware of how Facebook might
12 use that user share object for rendering on the
13 recipient side.

14 BY MR. JESSEN:

15 Q. Is it your position that the
16 creation of any kind of object in connection
17 with sending a message would constitute an
18 interception?

19 MR. RUDOLPH: Objection. Calls for
20 legal conclusion.

21 THE WITNESS: Like an illegal
22 interception?

23 BY MR. JESSEN:

24 Q. I mean I -- that's what you're
25 opining on in your report, I assume.

1 A. That -- that's fine. I just want to
2 make sure we're not --

3 Q. Yeah.

4 A. -- talking past each other where
5 you're --

6 Q. Right.

7 A. -- talking about something that I --

8 Q. You talk about interceptions of
9 content in this.

10 And I'm wondering if the creation of
11 an object in connection with the transmission
12 of a message, any object, you would consider to
13 be an unlawful interception.

14 MR. RUDOLPH: Same objection.

15 THE WITNESS: Yeah. I think that's
16 maybe just too hypothetical for me to answer as
17 you've asked it.

18 BY MR. JESSEN:

19 Q. Why is that?

20 A. You know, I'm trying to come up with
21 examples either way, which I'm just kind of
22 making up.

23 So I think it probably -- my answer
24 to everything --

25 Q. Well --

1 A. -- is always it depends. And I
2 think it probably does. But I don't know. I
3 could be talked through an exhaustive and
4 convinced one way or the other. But I think
5 that there's potentially a lot of variables to
6 consider.

7 Q. Well, let me give you an example.
8 So we produced in this case -- there are
9 objects that are created for each message
10 that's transmitted on the platform called ENT
11 messages.

12 Have you seen any of those?

13 A. I may have seen some of those.

14 Were those for the -- the
15 plaintiffs?

16 Q. They were for, yeah, like 19
17 messages.

18 A. I did see those.

19 Q. Some subset of that.

20 Is it your position that the
21 creation of those messages would be an unlawful
22 interception?

23 MR. RUDOLPH: Objection. Calls for
24 legal conclusion.

25 THE WITNESS: You know, I didn't

1 analyze them from that perspective. So I just
2 can't say right now.

3 Q. Okay. What about -- we also
4 produced -- there are objects that may be
5 created when -- and they have -- there's a
6 thread in a message, thread objects.

7 Would those -- would the creation of
8 those objects be unlawful interceptions?

9 MR. RUDOLPH: Objection. Calls for
10 legal conclusion.

11 THE WITNESS: Yeah. Again, I would
12 just -- I -- I haven't analyzed it from that
13 perspective. I wouldn't -- I wouldn't want to
14 jump to an answer now without taking the time
15 to give it some careful thought.

16 BY MR. JESSEN:

17 Q. So what is it that -- what is it
18 that makes creating a -- an object from a URL
19 attachment -- what is it that -- that -- that
20 specifically makes that an unlawful
21 interception?

22 MR. RUDOLPH: Objection. Calls for
23 legal conclusion. Mischaracterizes prior
24 testimony.

25 THE WITNESS: So my feelings on why

1 that's an issue and why that was a much clearer
2 issue is that creating that object is not
3 necessary to the delivery of the message. You
4 know, is it necessary to create an object for
5 the message itself for a thread? You know, I
6 don't know. I haven't thought through it in
7 depth. But it's not as obvious either --
8 either way to me.

9 But creating an object for the URL
10 share is not necessarily -- not necessary for
11 delivery.

12 BY MR. JESSEN:

13 Q. Well, you --

14 A. And that's why I've addressed that
15 issue here.

16 Q. You say in Paragraph 32 of your
17 report that objects represent things on
18 Facebook, right?

19 A. On 30 -- Paragraph 33, yes.

20 Q. I'm sorry. I'm sorry. Paragraph
21 33. Objects represent things on Facebook.

22 So the -- so a user share object
23 represents a share of a URL attachment by a
24 user, right?

25 A. That's right.

1 Q. It's -- it's an -- some -- it's an
2 object -- it's representing a thing, correct?

3 A. Yes.

4 Q. Okay. And that's unlawful because
5 it's not necessary to deliver the message.

6 That is your opinion?

7 MR. RUDOLPH: Objection. Calls for
8 legal conclusion.

9 THE WITNESS: Yeah. So I've
10 addressed it here because I believe, in the
11 context of all the other facts, that -- that
12 that becomes the issue. That's right.

13 BY MR. JESSEN:

14 Q. What other facts?

15 A. That there's a device that -- the
16 code that does the intercepting and that it
17 happens in transit.

18 Q. Well, by your definition of
19 "device," wouldn't any object be created by a
20 device?

21 Because you -- you've testified that
22 a device is lines of code.

23 So by definition, wouldn't any
24 object associated with a message be intercepted
25 by a device?

1 A. That could be true.

2 Q. And according to you, if that
3 happens before the message has been delivered,
4 then that's in transit, right?

5 A. From how I've analyzed the way that
6 these messages are processed, yes.

7 Q. So any use of source code to
8 generate a mess- -- to generate an object while
9 a message -- before a message reaches a point
10 of persistent storage, in your view, that's
11 illegal.

12 MR. RUDOLPH: Objection. Calls for
13 legal conclusion. Misstates prior testimony.

14 THE WITNESS: That object would have
15 to be unnecessary to the delivery of the
16 message.

17 BY MR. JESSEN:

18 Q. If it's unnecessary for the delivery
19 of the message, it's unlawful.

20 A. And all --

21 MR. RUDOLPH: Object --

22 THE WITNESS: Sorry.

23 MR. RUDOLPH: Objection. Calls for
24 legal conclusion.

25 THE WITNESS: And all the other

1 things.

2 BY MR. JESSEN:

3 Q. Right. Which is what -- which --
4 which is what I was mentioning in my earlier
5 question.

6 A. Right.

7 MR. JESSEN: Let me -- okay. I
8 think we've been going maybe -- actually, maybe
9 less than an hour. I'm not sure.

10 Are we getting close.

11 THE VIDEOGRAPHER: We have about 12
12 minutes left.

13 MR. JESSEN: Let's go to the end of
14 this tape.

15 BY MR. JESSEN:

16 Q. Are you okay with that?

17 A. Yes.

18 I just want -- I -- I maybe want to
19 add here, on these questions about what I
20 believe is unlawful or not --

21 Q. Right.

22 A. This is based on my understanding of
23 the law as it's been explained to me. But I
24 just want to be clear that I'm not trying to
25 offer opinions on the law here, just offer

1 opinions on what Facebook does and does not do.

2 Q. Okay. So if your -- if the law that
3 has been explained to you was inaccurate, then
4 some of your conclusions might be inaccurate as
5 well; is that fair to say?

6 A. I think maybe the opposite, that I'm
7 -- I don't know if, you know opposite. That --
8 that I'm making conclusions like Facebook
9 creates this thing.

10 Q. Right.

11 A. Or reads this or stores this here.
12 And the law could mean something else, but I
13 still think Facebook does that thing.

14 Q. To your -- you think -- I mean tell
15 me if I'm wrong, but your -- you can give -- as
16 a computer scientist, you can give an opinion
17 on the operation of something, source code,
18 servers, something along those lines; but you
19 can't really give an opinion on whether or not
20 that conduct would -- would fall within the --
21 fall underneath these two statutes, the Wire
22 Tap Act and the California Invasion of Privacy
23 Act; is that accurate?

24 MR. RUDOLPH: Objection. Form.

25 THE WITNESS: I -- I think that's

1 right. So there were particular issues I was
2 asked to opine on.

3 BY MR. JESSEN:

4 Q. Right.

5 A. The law was explained on why those
6 were important.

7 Q. Uh-huh.

8 A. You know, and I certainly considered
9 my understanding of the law as I looked at
10 this.

11 But I'm not trying to offer an
12 opinion on did Facebook do an illegal thing or
13 not. I'm trying to say did they do X, Y and Z,
14 which I'm told would be illegal, but basically
15 did they do X, Y and Z.

16 So if -- if the law -- if my
17 understanding of the law were wrong, so say it
18 actually -- like you're allowed to intercept
19 stuff in transit, you know, I'm still saying
20 that Facebook intercepts it in transit. Maybe
21 that doesn't matter.

22 Q. Well, you -- the only reason I'm
23 kind of getting into this is because you give
24 opinions sort of -- that talk about, you know,
25 Facebook's intercepting content while it's in

1 transmission using devices.

2 And so that's sort of -- it seems
3 like you are giving a -- giving an opinion with
4 -- at least within a legal frame work.

5 But I mean would you sort of -- can
6 you really -- can you really give an opinion on
7 whether or not something constitutes an
8 interception? Or instead can you just say
9 there are these objects that are created from
10 URL attachments and leave it at that?

11 Like are you qualified to say, "And
12 that's an interception, in my opinion"?

13 MR. RUDOLPH: Objection. Form.
14 Asked and answered. Compound.

15 THE WITNESS: Yes. I understand
16 what you're asking.

17 So I think I'm -- I'm operating on
18 my understanding of what an interception is.

19 BY MR. JESSEN:

20 Q. Right.

21 A. So if it were the case that I
22 misunderstood or was wrongly informed what an
23 interception was, then potentially those
24 conclusions could be wrong.

25 But I'm -- yeah. I'm not trying to

1 offer an opinion on -- on the law and just much
2 more an opinion on here's what I observe being
3 done in the system and let you guys all sort
4 out what's legal and what isn't.

5 Q. Okay. You're familiar with the
6 article -- excuse me -- in the Wall Street
7 Journal "How Private Are Your Private
8 Messages?" by Jennifer Valentino-DeVries and
9 Ashkan Soltani dated October 3rd, 2012?

10 A. Yes.

11 Q. When's the first time you became
12 aware of that article?

13 A. I believe it's sometime after I
14 started working on this case. I don't remember
15 having read it before.

16 Q. Okay. When exactly does the -- when
17 is user-specific share object created?

18 MR. RUDOLPH: Objection. Form.
19 Vague.

20 THE WITNESS: Like where in the
21 process?

22 BY MR. JESSEN:

23 Q. Well, sure. Let's start with that.

24 A. I think I have -- well, let me --
25 let me try the easy answer first, and then --

1 Q. Okay.

2 A. -- we'll see.

3 Q. Sure.

4 A. It's created relatively early in the
5 processing between when I hit send and when the
6 message is delivered to the recipient.

7 Q. What does it mean -- what do you --
8 does the entire delivery process take -- how
9 long does it take?

10 A. Less than a second.

11 Q. So what does it mean to say its
12 created relatively early in a process that
13 takes less than a second?

14 A. Well, there's a bunch of steps.

15 Q. Right.

16 A. And it's one of --

17 Q. Yeah.

18 A. -- the earlier steps in that
19 process.

20 MR. JESSEN: I think we can end this
21 tape now. I need a short break.

22 THE VIDEOGRAPHER: Off the record at
23 4:09.

24 This is the end of Media Unit No. 3.

25 (A short recess was taken.)

1 THE VIDEOGRAPHER: On the record at
2 4:44.

3 This is the beginning of Media Unit
4 4 in the deposition of Dr. Jennifer Golbeck.

5 BY MR. JESSEN:

6 Q. Welcome back, Dr. Golbeck.

7 On Paragraph 38 of your report, if
8 you could direct your attention to that, you
9 say: "The ENT global share also contains a
10 number of tracking information fields,
11 including share count, post count, Like count,
12 comment count and click count. These counts
13 each represent the number of times Facebook
14 users have engaged in the specific action
15 related to the URL at issue."

16 Did I read that correctly?

17 A. Yes.

18 Q. And do you have an understanding of
19 which of the counts reflects URL attachments
20 shared in messages?

21 A. I believe that's share count.

22 Q. Okay. In 39 you go on to say:
23 "When the user sends a private message
24 containing a URL, whether it is new to Facebook
25 or not, the share count field of the ENT global

1 share is incremented. In other words, the
2 count that" -- "the count that indicates how
3 many times the URL has been shared goes up by
4 one."

5 See that?

6 A. Yes.

7 Q. Are you saying that that always
8 happened whenever a user sends a URL in a
9 message, that the share_count field is
10 incremented?

11 A. If there's the URL attachment to
12 that message, I believe that's correct.

13 Q. Are you aware of any circumstances
14 where, even if there is a URL attachment, the
15 count in the -- in the share_count field would
16 not increase?

17 A. If the code works like it's supposed
18 to, it should always go up.

19 Q. What about -- are you familiar with
20 race conditions?

21 A. Yes.

22 Q. And do you have an understanding
23 that race conditions in this context could
24 prevent the count from going up for any given
25 URL share in a message?

1 A. Yes. I would count that as a type
2 of error.

3 Q. Okay. And database failures could
4 also cause that?

5 A. Absolutely.

6 Q. Okay. Are you saying that
7 incrementing the share count field in the
8 global share -- I'm sorry -- the share count
9 value in the tracking info field of the global
10 share object, is that part of the intercepting
11 that you're claiming?

12 MR. RUDOLPH: Objection. Form.

13 THE WITNESS: Yeah. I believe
14 that's part of what I'm saying, is that part of
15 the interception.

16 BY MR. JESSEN:

17 Q. If that -- if the field in that --
18 or if the counter in that field in the global
19 share object was not incremented, would that
20 mean that there was no -- would that mean that
21 there was not an interception?

22 A. There are other ways that that --
23 that data from those URL attachments is
24 intercepted aside from this count.

25 Q. For -- involving global -- involving

1 share objects or...

2 A. In -- do you mean involving the ENT
3 global share?

4 Q. Yeah. Or a -- or a user-specific
5 global share -- I'm sorry -- user-specific
6 share object.

7 A. So if this value were not
8 incremented by one, and the other types of
9 interceptions still happened, then there would
10 still be an interception.

11 Q. What are the other types of
12 interceptions you're referring to?

13 A. There's the creation of user URL
14 share object. There's also a log of the share,
15 which I get to in the next section.

16 Q. Okay. So -- so incrementing --
17 incrementing -- I'm trying to figure out what
18 is the interception.

19 Sounds like you're saying, if a
20 share object is created, that's -- if a
21 user-specific share object is created, that's
22 an interception, regardless of whether the
23 tracking info field is incremented; is that
24 correct?

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

1 Q. Okay. So you don't actually
2 consider the tracking info field, whether it's
3 incremented or not, to be part of the
4 interception, right?

5 A. That's not what I said.

6 Q. Okay. So it is part of it.

7 A. There are several interceptions that
8 take place.

9 Q. Uh-huh. And these are all things --
10 in your opinion, the several interceptions are
11 electronic processes taken place -- taking
12 place that aren't necessary to deliver the
13 message?

14 That's what makes them
15 interceptions?

16 A. Are we going back to my legal
17 understanding?

18 Q. Whatever you're opining on in this
19 case.

20 A. Okay.

21 Q. And I think you're giving -- you
22 seem to be -- you talk about interceptions,
23 so...

24 A. Yes. So there are three or four,
25 depending how you count ways --

1 Q. Uh-huh.

2 A. -- that messages are intercepted by
3 Facebook where the contents of the message are
4 redirected to code that's not necessary for the
5 delivery of the message.

6 Q. Right.

7 So any -- any -- any processing of a
8 message that is not necessary to deliver it you
9 would consider to be an interception.

10 MR. RUDOLPH: Objection. Form.

11 THE WITNESS: I'd have to see
12 specific examples.

13 BY MR. JESSEN:

14 Q. I'm just trying to figure out where
15 you're drawing the line, because it seems kind
16 of like an arbitrary line.

17 A. I'm not sure where your confusion
18 lies.

19 Q. Okay. So -- all right.

20 So the creation of the share object,
21 you consider that to be an interception.

22 Incrementing the share count value
23 in the tracking info field in the global share
24 object, you consider that -- is that a separate
25 interception?

1 A. Yes. Another type of interception.

2 Q. Okay. I'm going to get to the
3 logging.

4 But are those the only two
5 interceptions that involve share objects,
6 either user-specific or global share objects?

7 A. I -- I believe that's correct.
8 They're the only two that I've listed in here.

9 Q. And I think we went over this
10 earlier, but you don't have a way -- if I gave
11 you a global share object for a particular URL,
12 and you looked at the tracking info field, and
13 you looked at the share count portion of that
14 field, and let's say it was a number that said
15 7,563, there's no way for you to tell me to
16 take that number and work backwards and figure
17 out which Facebook users shared that URL
18 attachment in a private message, correct?

19 A. If all you're giving me is that in
20 global share with that number, that's correct.

21 Q. Okay. Is there other information,
22 if I gave you, that would allow you to figure
23 that out?

24 A. The user-specific URL's share
25 objects have information that indicates that

1 they are shares from private messages. And so
2 if I had access to that data and the URL, I
3 could trace it back.

4 Q. If you had -- if you had access to
5 the user specific share objects.

6 A. Correct.

7 Q. But you still wouldn't be able to
8 tell -- even if there was a user-specific share
9 object that was connected to the global share
10 object, you still wouldn't be able to tell if
11 that particular user-specific share object
12 incremented the tracking info field, right?

13 A. I don't think that's correct.

14 Q. Okay. Well, I thought that's what
15 you said earlier.

16 Where -- where am I going wrong?

17 A. So if a user URL share object is
18 created --

19 Q. Right.

20 A. It means that a user has sent a URL
21 attachment to their Facebook message. And
22 short of errors in the code, that will always
23 increment the share count field in the ENT
24 global share object in addition to creating the
25 user URL share object.

1 Q. But there are errors in the code,
2 are there not, from time to time?

3 A. There could be errors in the code
4 from time to time.

5 Q. And so you couldn't tell me -- you
6 could make a guess, but you couldn't tell me
7 with reasonable certainty that yes, this
8 particular URL share -- URL share did increment
9 that counter, correct?

10 A. I think that's unfair. I think I
11 would have a high degree of certainty that the
12 counter was incremented. Having looked at the
13 Facebook code, I think it's quite rare that you
14 get database failures that prevent these sorts
15 of things from being recorded.

16 Q. Are you aware of the testimony of
17 ■■■ ■■■ that this counter was not very accurate?

18 A. I don't recall that testimony. I'm
19 --

20 Q. Are you aware of his testimony that
21 there -- at different times, due to database --
22 database failures and other related issues, the
23 information was lost, particular shares?

24 A. I do recall that, yes.

25 Q. Okay. So --

1 A. I still think --

2 Q. -- you can't --

3 A. -- I'd be making a reasonable
4 estimate.

5 Q. You'd be making an estimate, though,
6 right?

7 A. Yes. There could be -- it could be
8 some digits off based on system errors.

9 Q. And it could be -- okay. Well, we
10 don't have to get into the other aspects.
11 Given the time, we won't.

12 So earlier we were talking about --
13 you were talking about that the user specific
14 share object is created early in the
15 transmission process.

16 Recall that testimony?

17 A. I do.

18 Q. And is that user-specific share
19 object created when the message has reached a
20 Facebook server and is in temporary storage?

21 A. It has reached a Facebook server and
22 is not in temporary storage.

23 Q. Why not?

24 A. I -- I don't know how to answer that
25 question.

1 Q. Is it in memory?

2 A. It is stored in memory.

3 Q. What's the difference between memory
4 and temporary storage?

5 A. Storage is -- so memory allows you
6 to operate on some data if it's in memory.
7 Storage, temporary or permanent, is a place
8 where information is stored that it can't be
9 operated on.

10 Q. What do you mean "operate on"? By
11 whom?

12 A. You can use it in code, do some
13 operations with that data. It has to be taken
14 out of storage to be processed.

15 Q. So if a message or -- if a message
16 or a URL attachment is in temporary storage, it
17 can't be operated on?

18 A. I think that's correct.

19 Q. Are you aware of the fact that the
20 Facebook Messages product uses a so-called
21 store-and-forward model?

22 A. Yes.

23 Q. Okay. What does that mean to you?

24 A. That the message is stored at
25 different steps along the way and then

1 forwarded on to following steps.

2 Q. What are the various places where
3 it's stored along the way?

4 A. Having looked at the Facebook code,
5 I don't see it very much stored along the way.
6 I see generally the sent messages received,
7 it's put through a series of steps that I
8 looked at, and it's delivered.

9 There may be additional steps in the
10 final delivery that I haven't looked at because
11 the interceptions that I've talked about here
12 take place early in the process.

13 Q. Would you have more expertise on the
14 Facebook messaging product than [REDACTED] [REDACTED]?

15 MR. RUDOLPH: Objection. Form.
16 Vague. Calls for legal conclusion.

17 THE WITNESS: So --

18 MR. JESSEN: I didn't think that
19 would be a hard question to answer.

20 BY MR. JESSEN:

21 Q. Go ahead.

22 A. So I don't think so. My hesitation
23 is that, in some of the 30(b)(6) depositions,
24 we've heard Facebook employees say they don't
25 really know how specific parts of a system

1 works, even though they worked on it. And I
2 don't remember if he's one of those.

3 Q. So I just want to understand.

4 Your testimony is that, when share
5 objects are created, they're not in -- they're
6 not in electronic storage? Is that your
7 testimony?

8 MR. RUDOLPH: Objection. Form.
9 Asked and answered.

10 THE WITNESS: We're talking about
11 the message being in storage, not the objects
12 being in storage?

13 BY MR. JESSEN:

14 Q. Well, when the -- you're saying that
15 the URL -- the U -- the creation of the share
16 object is an interception.

17 A. Yes. And The message is not in
18 storage at the point that that's created.

19 Q. Is the URL attachment in storage?

20 A. It is not.

21 Q. It's not in any kind of storage?
22 Temporary? Not in any kind of temporary
23 storage?

24 A. I think that's right. So there's a
25 -- there's potentially a separate object with

1 that data that's stored. But the actual
2 message and the attachment, no. They're in
3 memory.

4 Q. Isn't memory a -- a way to
5 temporarily store things?

6 A. I think in the context we were
7 talking about message delivery here, and when
8 we're talking about processing, no.

9 Q. But it is on a Facebook server.
10 All this stuff's on a Facebook
11 server, right?

12 A. All -- yeah. All this code's
13 executing on a Facebook server, yes.

14 Q. In Paragraph 43, you talk about
15 logging of private message content. You say:
16 "Once Facebook intercepts the URL content of a
17 user's private messages in the form of user URL
18 share objects and ENT shares, it logs that
19 content in numerous ways, including" it's --
20 "in various tables."

21 Do you see that?

22 A. Yes.

23 Q. Are you saying that the logging
24 occurs after the message has already been
25 intercepted?

1 A. That the -- the user URL share
2 object is created, and that is one of the
3 interceptions. Just thinking back to the code,
4 I believe it's the case that, in the process of
5 creating that, this logging occurs.

6 Q. So is it part of -- would you
7 consider that -- the logging to be part of the
8 interception?

9 A. Yes.

10 Q. What is logging? We talked about
11 this a bit earlier, but refresh my memory.

12 A. It's essentially recording -- gen-
13 -- generally recording something that happened.

14 Q. Okay. Is it unusual?

15 MR. RUDOLPH: Objection. Vague.

16 THE WITNESS: Logging this kind of
17 thing or logging -- having logs in general?

18 BY MR. JESSEN:

19 Q. Well, in -- first let's start in
20 general.

21 A. In general, no. Things like
22 accesses to Web pages are logged all the time.

23 Q. Okay. Is the kind of logging that
24 you're talking about here unusual?

25 MR. RUDOLPH: Objection. Form.

1 THE WITNESS: I think this is. I
2 was surprised that this was happening.

3 BY MR. JESSEN:

4 Q. Why do you say that?

5 A. Why was I surprised that it was
6 happening?

7 Q. Yeah. And why -- and why do you
8 think it's unusual?

9 A. I -- I think it's unusual for
10 companies to look at -- you know, companies,
11 but certainly other places, to look at the
12 contents of messages and create records of the
13 activities of those contents that are outside
14 the scope of what's necessary to deliver the
15 message. I find that unusual.

16 Q. What sources did you consult to
17 understand whether and how Facebook logs URL
18 data from private messages?

19 A. So I certainly looked at the code.
20 I -- looking at Paragraph 46 in here, I cite
21 some testimony from [REDACTED] [REDACTED] and from [REDACTED] [REDACTED]. I
22 believe I also cite some Facebook documents
23 about the logging issue, both for [REDACTED]
24 and for Nectar.

25 Q. I think when you said testimony by

1 ■■■■ ■■■■, you're referring perhaps to an e-mail
2 from 2010.

3 A. Yeah. I'm sorry. You're right.

4 Q. In Paragraph 45, you -- first of
5 all, what are -- what's -- what -- what is

6 ■■■■■■■■■■

7 A. So we call it ■■■■■■■■■■ just for
8 short.

9 Q. Okay. Fair enough.

10 A. It's a table that has a record of
11 the user ID, the fact that they have shared a
12 URL, the time that they've done it, I believe
13 it points to the global ENT share. And there's
14 an indicator that that action was taken in a
15 private message or not.

16 Q. You do discuss some of these things
17 in Paragraph 45. You say: "The ■■■■■■■■■■
18 table records the user ID, an action that user
19 has taken like a share or a Like, the time of
20 that action, and points pointers to data
21 structures that have more information about the
22 URL, in this case sent through a private
23 message."

24 You don't actually cite anything in
25 support of that.

1 What are you basing that statement
2 on?

3 A. That actually is in the
4 [REDACTED] file, which I do cite at least
5 in Paragraph 49. That has a full description
6 of the fields in [REDACTED]

7 I believe I cite it somewhere else
8 in the report that I'd be happy to look through
9 if you want me to find it.

10 MR. JESSEN: Let me mark another
11 document. This will be Exhibit 4.

12 (Deposition Exhibit 4 was marked for
13 identification.)

14 BY MR. JESSEN:

15 Q. Okay. So I've handed you several
16 printout -- source code printouts.

17 A. Uh-huh.

18 Q. And I believe the -- you
19 referenced -- well, Paragraph 49 of your
20 report, I think.

21 A. Correct.

22 Q. And so -- and then you have a
23 footnote to paragraph -- I'm sorry -- footnote
24 to 28 referencing Page 14183.

25 Is this what you're sort of relying

1 upon?

2 A. Yes.

3 Q. And which parts specifically are you
4 relying on for your -- the first sentence in
5 Paragraph 45?

6 A. So in Paragraph 45 I list that this
7 looks at a record of the user ID, I believe
8 that's on line 16; the action the user has
9 taken, which is line 15, the time of the action
10 on line 13; the pointer to data structures,
11 which I believe is on both 17 and 18; and then
12 is posted on line 20 is an indicator of whether
13 it was publicly posted or not, which would
14 indicate its in a private message.

15 Q. Based on your analysis of the code,
16 when did this logging in [REDACTED] start?

17 A. I don't know that I actually saw
18 when it started. It certainly started before
19 the class period.

20 Q. Okay.

21 A. 2010 there were issues with the
22 [REDACTED] table that were corrected.

23 Q. Do you know if the logging and share
24 stats continue past December 2012?

25 A. I believe it did, but I don't have

1 access to the code after that point.

2 Q. Why do you believe it did?

3 A. All of the code up until that point
4 that operates with the [REDACTED] table
5 operated up till that point in the same way.
6 So it could be that, on January 1st, 2013, all
7 of the code was changed. That seems highly
8 unlikely to me.

9 Q. You said there was a -- a fix in
10 2010?

11 A. Correct.

12 Q. What was that?

13 A. They weren't properly marking that
14 messages were -- that these shares were taking
15 place in private messages. So private message
16 URL share data was being exposed publicly, and
17 there were a few attempts to update what was in
18 the table to hide the fact that those private
19 message shares were being recorded.

20 Q. What do you mean "hide"?

21 A. Well, they -- I mean one fix for the
22 fact that private messages were being logged
23 and exposed would be to stop logging private
24 messages, which isn't what they did. They just
25 put in a flag to say hide these pieces of data

1 from people who are publicly looking.

2 Q. Why did they do that?

3 MR. RUDOLPH: Objection. Calls for
4 speculation. Lacks foundation.

5 THE WITNESS: Why did they make the
6 change?

7 BY MR. JESSEN:

8 Q. Correct.

9 A. So there's a few places that I cite
10 in here. Just give me one second.

11 Yeah. So I think the main fix for
12 excluding this -- I don't recall, and I don't
13 see it listed here, what their motivation was
14 for making that change.

15 Q. But are you -- are you -- is it
16 possible that -- I mean you said that they
17 were -- private messages were being exposed.

18 Do you -- do you think they didn't
19 want those private messages exposed?

20 Could that -- could that have been
21 the motivation to make the change?

22 MR. RUDOLPH: Objection. Calls for
23 speculation.

24 THE WITNESS: I -- from all of the
25 documents that I've looked at, Facebook is

1 concerned about people being concerned about
2 their privacy but not necessarily concerned
3 about stopping the things that people are upset
4 about. They are concerned with stopping people
5 from seeing that.

6 So it could be the case that they
7 were concerned about privacy. Or it could be
8 the case that they were concerned that people
9 would be upset about it.

10 BY MR. JESSEN:

11 Q. Is there a distinction between a
12 social network logging information and keeping
13 records internally and exposing that
14 information to the entire world?

15 MR. RUDOLPH: Objection. Form.
16 Vague.

17 THE WITNESS: Yes.

18 BY MR. JESSEN:

19 Q. Okay. What's the distinction?

20 A. One is kept internally, and one's
21 exposed to the world.

22 Q. It sounds like, in your mind,
23 they're both equally bad.

24 A. I think they're both bad.

25 Q. Equally bad?

1 A. They're --

2 MR. RUDOLPH: Objection. Form.

3 THE WITNESS: They're both privacy
4 violating. I think it's worse to expose it,
5 but I think it's privacy violating either way.

6 BY MR. JESSEN:

7 Q. What do you mean by "privacy
8 violating"?

9 A. I mean if the post office started
10 opening my mail, scanning it and posting it
11 online, I'd be really upset. If their fixed to
12 that was to stop posting it online but to keep
13 opening it and scanning it and reading it, that
14 would still be an invasion of my privacy.

15 Q. You think it's an invasion of
16 privacy for Facebook to keep track of
17 aggregated data regarding the kind of URLs that
18 are shared on its Web site?

19 A. Sent in private messages or sent
20 generally?

21 Q. Both.

22 A. I think it is a violation of privacy
23 to scan the contents of private messages even
24 to create aggregated data.

25 Q. Why is that?

1 A. Because they're private.

2 Q. Then how is that an invasion of a --
3 of privacy if it's aggregated data,
4 nonpersonally identifiable?

5 A. So I don't know how philosophical
6 you want to get on this. But privacy, well
7 established in the psychological community, is
8 the ability for one person to control what they
9 disclose to whom and when.

10 So it's not simply that sharing
11 information violates privacy. It's that I've
12 made a choice to share it; and in the case
13 where I'm sending a private message, that
14 message is intended for the person that I'm
15 sending it to. If I don't intend to share that
16 with Facebook, the contents of that message,
17 then Facebook going in there without my consent
18 or understanding violates my privacy in that I
19 have not made a conscience choice to share that
20 data with Facebook at that time.

21 Q. Is -- is Facebook, in your view,
22 scanning every message that contains a URL?

23 A. Every -- well, what do you mean by
24 "scanning"?

25 Q. You -- that was your -- you used the

1 word.

2 A. At what point in the process?

3 Q. Any point.

4 A. So --

5 Q. From the time the message is -- from
6 the time the message is -- you press send until
7 delivery.

8 A. If that message has a URO
9 attachment, I believe --

10 Q. Okay.

11 A. -- they're, short of code errors,
12 looking at all of them, yes.

13 Q. And if -- they're not looking at it
14 if it's just got -- if it doesn't have an
15 attachment.

16 A. I haven't --

17 MR. RUDOLPH: Objection. Form.
18 Vague.

19 THE WITNESS: I haven't looked at
20 all of that yet in the code.

21 BY MR. JESSEN:

22 Q. But you don't know that they're
23 doing that now.

24 I mean you don't have and opinion
25 that they're scanning messages that just

1 contain a URL and don't have a URL attachment,
2 right?

3 A. I don't offer any opinions on here.
4 Right.

5 Q. But you -- and you don't have any
6 reason to think they are doing that, do you?

7 A. I -- I just don't know. I haven't
8 looked.

9 Q. Do you have a reason to think
10 they're doing it?

11 A. I have no reason either way.

12 Q. Okay. So for some reason they're
13 just looking at the ones that have the
14 attachments.

15 MR. RUDOLPH: Objection. Form.
16 Argumentative.

17 THE WITNESS: Is that a question?

18 BY MR. JESSEN:

19 Q. Yeah.

20 A. What --

21 Q. That --

22 A. What are you asking?

23 Q. That's what they're doing.

24 Your view is they're just scanning
25 the ones -- they're scanning the ones that have

1 attachments.

2 A. They are scanning the ones that have
3 attachments.

4 Q. Because of the -- because the
5 preview was created.

6 Coincidentally, those just happen to
7 be the ones they're scanning if there's a
8 preview; is that -- that's your testimony.

9 MR. RUDOLPH: Objection. Form.
10 Misstates prior testimony. Argumentative.

11 THE WITNESS: I'm not sure I totally
12 understand the question. They are scanning the
13 attachments of messages with URLs that have the
14 preview attachment.

15 BY MR. JESSEN:

16 Q. But not the others.

17 A. I don't know if they're doing the
18 others.

19 Q. Okay. Well, why -- why -- why are
20 they doing one and not the other, in your
21 opinion?

22 MR. RUDOLPH: Objection. Form.
23 Lacks foundation. Calls for speculation.

24 THE WITNESS: So I don't know that
25 they're not doing the other.

1 BY MR. JESSEN:

2 Q. But you don't have any information
3 that they are.

4 A. I haven't looked either way, right?
5 There's --

6 Q. You haven't looked?

7 A. I have not -- that's right. I have
8 not looked in the code about scanning of the
9 message content itself yet.

10 Q. Okay.

11 A. So I don't know if that answers your
12 question.

13 Q. Right.

14 Let's move on to your discussion of
15 Nectar.

16 What is Nectar?

17 A. Nectar is another platform for
18 logging on Facebook.

19 Q. And what do you base -- what's
20 your -- what's your understanding of Nectar
21 based upon?

22 A. I've seen it used in the code. And
23 then also, as you can see here in this section
24 starting at Paragraph 52, there are a number of
25 references to Nectar in Facebook documents

1 that -- that describes things being logged
2 there.

3 Q. What gets logged in Nectar?

4 A. Just give me one second to review --

5 Q. Sure.

6 A. -- what I have here.

7 So if you look in Paragraph 52, this
8 Facebook document that I've cited says that in
9 Nectar they are logging relevant actions that
10 create relationships or show clickable links,
11 including things from the inbox.

12 That same document that goes on to
13 say: "The places that we log the data are in
14 Nectar platform and Nectar content action."

15 And then I'm referring to code in
16 Paragraph 54.

17 Q. Uh-huh.

18 A. I've quickly flipped through here --
19 I could look deeper if you want -- to this

20 [REDACTED] that
21 refers to Nectar and the way that they're
22 logging details there.

23 Q. So is it safe -- I mean the e-mail
24 you cited from July 2010, is it -- is it -- is
25 it -- can you say, to a reasonable degree of

1 computer scientific certainty, that what's
2 described in an e-mail is how the system is
3 operating?

4 A. Like do I think the Facebook
5 engineers are lying to each other about what
6 they're recording where?

7 Q. No.

8 Can you -- can you read an e-mail --
9 rand an unfortunately we don't have time to --
10 to do it.

11 But can you -- can you look at an
12 e-mail and discern from an e-mail that discuss
13 many different types of data and many different
14 types of information what's going on in the
15 code?

16 A. Ah --

17 Q. And in -- in -- in -- go ahead.

18 A. So I think you can draw a lot of
19 conclusions from things that engineers discuss
20 in e-mail. Could I reproduce the code from it?
21 No. But I do cite to code here also that logs
22 events in Nectar.

23 Q. You say that, when a URL -- in

24 Paragraph 54: "When a URL is scraped or"
25 prescraped -- "or a prescraped URL is accessed,

1 Facebook logs the event in Nectar."

2 What -- what do you mean by
3 "scraped" or "a prescraped URL is accessed"?

4 A. I believe that's referring to an
5 access to an ENT global share object. But I'd
6 want to look at that code to make sure if you
7 want me to go in -- in depth to that.

8 Q. When a global share object is
9 accessed by what?

10 A. I believe the share scraper code.

11 Q. So before the message is sent?

12 A. I believe that's right.

13 Q. Is it possible that the logging in
14 Nectar was only being done on a sample --
15 sample basis?

16 A. It seems unlikely, given how I've
17 seen it used in the code, but I suppose it
18 could be possible.

19 Q. I'm just -- and again, I'm trying to
20 cut through some of this.

21 But there's a reference in the code
22 to a [REDACTED] [REDACTED] [REDACTED].

23 A. Where is --

24 Q. And --

25 A. -- that in the code.

1 Q. It's -- so if you go to the Bates
2 No. FB 14195 in Exhibit 4.

3 A. Okay.

4 Q. And -- yeah. So on the left-hand
5 column, [REDACTED] [REDACTED], it references a [REDACTED] [REDACTED].

6 A. It does.

7 Q. So does that affect your conclusion
8 at all or...

9 A. That line does not, no.

10 Q. Why not?

11 A. So that's pulling something called a
12 share scrape log rate. But it actually -- if
13 the sampling were being done here, you would
14 see that sampling rate actually used to adjust
15 whether or not a function was called. And that
16 doesn't happen.

17 It's just a variable that's passed
18 in to the creation of the event variable.
19 There's nothing in this line that says how
20 that's used -- nothing in this function.

21 Q. What other kinds of data are logged
22 in Nectar?

23 A. Other besides what?

24 Q. Scraped or prescraped URLs being
25 accessed.

1 A. So again, going back to Paragraph 52
2 and 53, in reference to that e-mail, they talk
3 about logging actions that create relationships
4 or show clickable links.

5 Q. And so your testimony is that that
6 information is also contained in Nectar?

7 A. Yes.

8 Q. Have you seen that in the code?

9 A. I don't recall if I have or not.
10 I've looked at a lot --

11 Q. Because what --

12 A. -- of code.

13 Q. -- you're citing here is an e-mail
14 from July of 2010.

15 And can you tell me, to a reasonable
16 degree of computer science certainty, that this
17 information discussed in that e-mail in
18 Paragraph 52 is reflected in the Nectar log --
19 or in -- excuse me -- in Nectar?

20 A. I think it's reasonable to draw a
21 conclusion from an e-mail between Facebook
22 engineers that say, "We're doing X," that they
23 were, in fact, doing X.

24 Q. The e-mail doesn't exactly say what
25 you're saying it says, which is the issue.

1 MR. RUDOLPH: Hold --

2 BY MR. JESSEN:

3 Q. But -- but that wasn't my question.

4 The question was can you tell me,
5 based upon a reasonable degree of computer
6 science certainty, that that information is
7 reflected in Nectar?

8 MR. RUDOLPH: Objection. Form.
9 Argumentative. Asked and answered.

10 THE WITNESS: I -- I think my
11 answer's the same. I think it's reasonable to
12 conclude from an -- an e-mail between Facebook
13 engineers that what they say is happening is
14 happening.

15 BY MR. JESSEN:

16 Q. Assuming you -- assuming you've
17 interpreted the e-mail correctly, right?

18 A. Yes.

19 Q. Okay. Let's talk a little bit about
20 the various uses of what you refer to as
21 intercepted private message data.

22 Is it fair to say that all the uses
23 you are discussing involve the use of
24 aggregated nonpersonally identifiable
25 information?

1 MR. RUDOLPH: Objection. Form.

2 THE WITNESS: So I think, when we --
3 we briefly touched on this before --

4 BY MR. JESSEN:

5 Q. Yeah.

6 A. -- that the activity feed presents
7 an edge case where there could be personally
8 identifiable information exposed.

9 The other cases all use aggregated
10 data that reasonably seems to be not personally
11 identifiable.

12 Q. When you referred earlier -- I think
13 you said that some private message content had
14 been -- I don't want to misquote you, but It
15 think you said exposed?

16 A. Yes.

17 Q. Was that a reference to the activity
18 plug-in or something --

19 A. The activity --

20 Q. -- else?

21 A. -- feed plug-in, yes. It was a
22 reference --

23 Q. And --

24 A. -- to that.

25 Q. And what were you referring to there

1 specifically?

2 A. There's an issue where -- that
3 popped up that I really didn't -- with an ex-
4 -- an exter- -- a person external to Facebook
5 identified that, if I sent you a private
6 message with a URL in it, that the URL that I
7 sent to you could appear in the activity feed
8 of my friends as a URL they might want to check
9 out; which, if it's something like New York
10 Times, is not personally identifiable; if it's
11 a link to the draft version of my personal Web
12 site or, you know, pictures of me that I don't
13 want exposed to the public, suddenly that
14 becomes visible and is potentially identifiable
15 with me.

16 Q. And so when that was happening,
17 wouldn't -- I mean tell me if I'm wrong.

18 But is your understanding that it
19 wouldn't say "Jen Golbeck," you know, "shared
20 this link." It would just -- that -- it would
21 recommend that link or the -- it would say
22 "Someone shared this" in the activity feed.

23 I mean is that your understanding?

24 A. I believe the latter is correct.
25 Right.

1 Q. Okay. But you're saying, depending
2 on the URL, a URL could -- some URLs could be
3 personally identifiable depending on sort of
4 what it is.

5 A. Right.

6 Q. Is it your understanding that that
7 was a -- that was a bug back in the 2010, 2011
8 time period?

9 A. You know, I don't know if I'd call
10 it a bug. But it could be an un- -- unintended
11 consequence of how it was implemented.

12 Q. And do you have an understanding
13 that Facebook ultimately resolved that issue?

14 MR. RUDOLPH: Objection. Form.

15 THE WITNESS: I do, yes. My
16 understanding is that they changed that.

17 BY MR. JESSEN:

18 Q. You don't think that that was
19 intentional functionality on their part, do
20 you?

21 MR. RUDOLPH: Objection. Calls for
22 speculation.

23 THE WITNESS: I don't think that
24 they set out with the intention of saying, "We
25 will take private message shares that could be

1 sensitive and show them to other people."

2 I think they probably didn't care,
3 and that's why it happened.

4 BY MR. JESSEN:

5 Q. Why do you think they didn't care?

6 A. This would be a really simple thing
7 to prevent from happening if that kind of
8 privacy concern were at the forefront in your
9 development.

10 Q. Would the -- do you know what year
11 this issue...

12 A. I believe 2010.

13 Q. Okay. And do you know when they --
14 when they fixed that?

15 A. 2011. So actually, I think 2011 is
16 the only year I know. I'm not...

17 Q. Okay.

18 A. Yeah. I'm not sure if 2010 was when
19 the activity feed was introduced.

20 Q. Okay. And that was before the class
21 period started in this case, right?

22 A. That's correct.

23 Q. Okay. You talk a little bit about
24 recommendations.

25 What's your understanding of

1 recommendations -- the recommendations widget?

2 A. What about it?

3 Q. Like what was it? What was the
4 recommendations functionality?

5 A. It recommended links to people that
6 Facebook thought they might be interested in.

7 Q. And were those recommendations made
8 on Facebook.com or on that particular Web site?

9 A. I believe they were external. It
10 was a third-party plug-in for use on other Web
11 sites.

12 Q. And what's your understanding of
13 how -- how certain URLs were recommended on
14 those Web sites?

15 A. That there was a Facebook plug-in
16 widget that would display those recommended
17 links. It sort of had its own separate
18 window and would display those recommended
19 links in it.

20 Q. And what determined what links were
21 recommended?

22 A. It's a pretty complex process,
23 actually, generating those recommendations. I
24 don't know that I have a full handle on --

25 Q. Uh-huh.

1 A. -- all of the code for the entire
2 process. There's some specific files that use
3 the data that we're talking about here that I
4 cite in the report.

5 Q. Was -- is it fair to say that, for a
6 period of time, the URLs shared in Messages --
7 URL attachments -- because they incremented one
8 of the -- one of the values in the tracking
9 info field in this global share object,
10 which -- that influenced, among many other
11 things, how popular that particular URL was,
12 and thus, you know, how likely it was to be
13 recommended on a third-party Web site?

14 A. That's a fair characterization.

15 Q. Okay. And at -- other kinds of URL
16 shares went into that calculation as well, such
17 as public posts, comments on URLs, so on and so
18 forth.

19 A. Right.

20 Q. Okay. And is it your understanding
21 that at some point Facebook stopped including
22 URLs -- URL attachments in private messages in
23 that calculation?

24 A. I'm actually just unsure. The code
25 has changed since the initial file that

1 identified and cited here. And I'm still

2 looking to try to see one way or another if
3 those values are being used now.

4 Q. Okay. So in Paragraph 60 when you
5 say in the last sentence -- and you're
6 referring to recommendation -- "This use proves
7 that private message content was used to affect
8 these external recommendations made to other
9 users," you're referring to the URL attachment
10 which led to the creation of a user-specific
11 share object which incremented the tracking
12 info field in the global share object, which
13 informed the recommendations.

14 A. I think that -- that's a fair
15 description of the process. I'm not sure if
16 that incrementing of the field in the global
17 share object necessarily follows exactly like
18 you said from the creation of the user share
19 object. But the -- the essence of it is right.

20 Q. There could be variability regarding
21 whether or not a user share object incremented
22 the tracking info field?

23 A. I would just want to look at the
24 code to see if that's a single unified process
25 or separate process. That's the only thing I'm

1 catching on there.

2 Q. Okay. You have a section called
3 "Insights Developer API."

4 And let's talk a little bit about --
5 what are you referring to in this section
6 specifically? What sort of a gravamen of
7 the -- the use of this private -- this
8 intercepted private message content that you're
9 referencing here?

10 A. This provided demographic
11 information about people who had interacted
12 with URLs of external Web sites, in this case
13 shared those URLs in a private message.

14 Q. And you do cite a lot of -- well,
15 what -- in -- in -- in reaching -- you cite a
16 lot of e-mails and sort of other documents in
17 this section.

18 Were you able to observe in the code
19 itself the -- the phenomena that you're
20 discussing?

21 A. I haven't been able to track it down
22 in the code yet.

23 Q. Okay. Do you know if, throughout
24 the entire class period, URL attachments shared
25 in messages were reflected in the Insights

1 dashboard?

2 A. I don't know if they were reflected
3 there for the whole class period.

4 Q. And similarly, do you know if, to
5 the extent they were reflected in
6 Domain Insights, they would have been reflected
7 in the demographic information?

8 A. I'm sorry. Can you rephrase that
9 question for me?

10 Q. Yeah. Sorry. That was a poorly
11 worded question.

12 So for the duration of the class
13 period, do you know -- well, strike that.

14 The -- earlier I think you testified
15 you haven't been able to track down in the code
16 whether, throughout the entire class period,
17 URL attachments shared in messages were
18 reflected on the Insights dashboard.

19 Would you say the same thing about
20 specifically demographic information from URL
21 attachments and messages? You don't know if
22 that was reflected of the insights dashboard?

23 A. For the entire class period?

24 Q. Correct.

25 A. That's correct.

1 Q. Do you -- do you know that it was
2 implemented for -- for some part of the class
3 period?

4 A. So I have this cited in Paragraph
5 74, experiments that Ashkan Soltani ran that
6 suggest that they were included in there.

7 I have not tracked down the code
8 related to that yet.

9 Q. Uh-huh.

10 A. Be the same as the other code we
11 were talking about. But his experiments
12 strongly suggest that it was included there.

13 Q. And so that would be things like
14 gender, age range, language, country, that sort
15 of -- sort of broad demographic data?

16 A. Correct.

17 Q. Okay. And -- and we discussed this
18 briefly earlier, but Domain Insights allowed
19 the owner of a domain to go in an access
20 certain kinds of analytics about people's
21 interactions with his or her Web site?

22 A. Right.

23 Q. Okay. Do you know, for any given
24 Web site, whether the Insights dashboard was
25 actually viewed by the domain owner?

1 A. I'm sorry. Can you repeat that?

2 Q. Yeah. Sorry.

3 Do you know, for any given Web site,
4 whether or not the insights dashboard for
5 that -- reflecting information for that site
6 was actually viewed by or accessed by the
7 domain owner?

8 A. I'm certain that information exists
9 at Facebook, but I haven't seen any of it.

10 Q. But I'm -- I'm asking like would the
11 owner of the domain -- is there way -- a way to
12 tell if the -- do you know if the owner of the
13 domain ever actually went and looked at it?

14 A. The answer's the same. I'm sure
15 that information exists at Facebook. That's
16 just not information I have.

17 Q. Okay.

18 A. So you could tell, for any given
19 domain --

20 Q. Oh, I see what --

21 A. -- if someone --

22 Q. -- you're saying.

23 A. -- had accessed it and -- and looked
24 at it.

25 Q. I see what you're saying. Okay.

1 What's your understanding regarding
2 the relationship between external node
3 recommendations --I'm sorry -- external node
4 recommenders and Taste?

5 A. My understanding -- let me just go
6 back to that.

7 My understanding is that Taste
8 replaced functionality of the external node
9 recommender.

10 Q. Uh-huh. And do you know, for -- for
11 the duration of the class period, if Taste has
12 used information from URLs shared in messages?

13 A. I don't know.

14 Q. Okay. Regarding Paragraph No. 79,
15 "API Queries," we talked, again, about this a
16 bit earlier, but what are your -- your
17 conclusions with respect to API queries is
18 that you could -- you could -- you could query
19 the API for a given Web site and get sort of
20 general analytics data about interactions with
21 the site?

22 A. Right. You could get the counts of
23 how many people had shared the URL, which
24 included --

25 Q. Uh-huh.

1 A. -- shares through private messages.

2 Q. Uh-huh. Were the shares from
3 private messages broken out separately from --
4 from broader shares, or were they included with
5 another category?

6 A. I believe all the -- all the shares,
7 public and private, were grouped together.

8 Q. Okay. Do you know if this
9 information -- if URL -- URLs shared in private
10 messages are still reflected in the information
11 accessible through API queries?

12 A. I believe they are not.

13 Q. Okay. Do you know when that
14 stopped?

15 A. I don't know.

16 Q. Okay. You talk a little bit about
17 incrementing the Like counter in -- starting on
18 Page 23 of your report.

19 A. Quite a bit about it.

20 Q. Yeah. That's true.

21 You're aware that, for a period of
22 time, there was what you describe as double
23 counting?

24 A. Yes.

25 Q. You discuss that on Paragraph 83.

1 Do you think that was an intentional
2 thing Facebook did --

3 A. I don't --

4 Q. -- or do you think it was a bug?

5 A. I don't --

6 MR. RUDOLPH: Objection. Form.

7 THE WITNESS: I don't know if I'd
8 put it in either category. I certainly don't
9 think they set out with the intent of counting
10 twice. But they didn't seem super concerned
11 about it in their internal messages.

12 BY MR. JESSEN:

13 Q. About counting twice?

14 A. Yeah. They -- they wanted to fix
15 it, but they were not unhappy with the high
16 Like counts, was my reading of those messages.

17 Q. Okay. Do you know, during the time
18 that -- that the -- the Like counts were being
19 incremented by two, do you know if the
20 information in the tracking info field in the
21 global share object was also being incremented
22 by two?

23 A. I understand your question. I'm
24 just thinking about how the code connects this.

25 I believe that's correct, looking at

1 the code that I have here.

2 Q. And really in -- in Paragraphs 85 --
3 we're running short on time -- but 85 through
4 93, you really discuss -- actually, strike
5 that. Let's move on.

6 Are you of the view, Dr. Golbeck,
7 that keeping a count of the times that a URL is
8 shared across a Web site, including in private
9 messages, is unlawful?

10 MR. RUDOLPH: Objection. Calls for
11 legal conclusion.

12 THE WITNESS: Yeah. It's a really
13 legal question.

14 BY MR. JESSEN:

15 Q. Should it be unlawful?

16 MR. RUDOLPH: Same objection.

17 THE WITNESS: Depends.

18 MR. JESSEN: I bet I know your
19 answer on that one.

20 (Discussion off the stenographic
21 record.)

22 BY MR. JESSEN:

23 Q. Just want to go back to something we
24 discussed earlier briefly.

25 If a user composes a message and a

1 URL preview is generated, and then the user
2 hits the send button, and the body of the
3 message is sent along with the URL attachment,
4 and that message goes to a -- message and the
5 attachment go to a Facebook server, if -- if
6 the message and the attachment, okay, if
7 they're in memory on a Facebook server, and the
8 message is awaiting final delivery to a
9 recipient, do you consider that message to be
10 in temporary intermediate storage incidental to
11 the electronic transmission?

12 A. I would not --

13 MR. RUDOLPH: Objection. Objection.
14 Form. Calls --

15 BY MR. JESSEN:

16 Q. Would you --

17 MR. RUDOLPH: -- for legal
18 conclusion.

19 BY MR. JESSEN:

20 Q. Would you -- you understand there
21 could be a difference of opinion on that?

22 MR. RUDOLPH: Objection.

23 BY MR. JESSEN:

24 Q. That other computer scientists might
25 disagree with what you're saying there?

1 MR. RUDOLPH: Objection. Form.
2 Calls for speculation.

3 BY MR. JESSEN:

4 Q. Or do you think the view that you're
5 espousing is beyond dispute?

6 A. I always think my views are beyond
7 dispute. No. That's not true.

8 I could see someone trying to wedge
9 a technical argument that would say it was
10 temporary storage incidental to the
11 transmission. I think it's -- honestly, I
12 think it's like such a slimy manipulation of
13 the term as to render it meaningless. So
14 someone could disagree with --

15 Q. I'll --

16 A. -- it, but I'd -- I would think very
17 strongly that they were wrong about that.

18 Q. Almost like saying a line of source
19 code could be a device?

20 MR. RUDOLPH: Objection.
21 Argumentative.

22 THE REPORTER: Could you repeat that
23 because of the siren.

24 BY MR. JESSEN:

25 Q. Almost like saying a line of source

1 code could be a device?

2 A. Are you implying that I'm slimy?

3 Q. No.

4 A. You know I do patent testimony,
5 right? So I'm really good at the technical
6 details.

7 Q. No, I know. I know you do patent
8 testimony.

9 Okay. Let's talk -- and you and I
10 could have very interest philosophical
11 conversations, by the way, but we'll have to
12 save those --

13 A. Off the record.

14 Q. -- for another -- another time.

15 Okay. Let's -- I want to go to --
16 you have a discussion on -- starting on Page 27
17 that says: "Class members are ascertainable."

18 A. Yes.

19 Q. I want to talk a little -- I have
20 some questions about that. We talked about it
21 briefly earlier.

22 In Paragraph 102 you discuss the
23 proposed class in this case.

24 And do you understand that the --
25 what we call the putative class members must be

1 natural persons?

2 You understand that?

3 A. I do.

4 Q. Located within the United States.

5 You understand that?

6 A. Yes.

7 Q. Okay. Who sent or received a
8 message from a Facebook user.

9 You see that?

10 A. A private message.

11 Q. Right. I use "private message" and
12 "message" synonymously.

13 A. That's part of our core
14 disagreement.

15 Q. Perhaps.

16 That included a URL in its
17 content --

18 A. Yes.

19 Q. -- correct?

20 A. Yes.

21 Q. And from which Facebook generated
22 the URL attachment, correct?

23 A. Yes.

24 Q. From within two years of the filing
25 of this action, which is December 31st, 2011 --

1 or excuse me -- December 30th, 2011, up through
2 the date of class certification.

3 A. I see that, yes.

4 Q. Okay. So that's the proposed --
5 that's the -- that's the class that the
6 plaintiffs are asking the court to certify.

7 In Paragraph 103, you say that, to
8 retrieve a list of class members, the code
9 process should be relatively straightforward.
10 A database query could be used to select the
11 Facebook user IDs of everyone whose actions had
12 created an ENT share from a private message,"
13 correct?

14 A. Yes.

15 Q. Okay. And "ENT share" is synonymous
16 in this context with "user-specific share
17 object"?

18 A. Correct.

19 Q. Okay. Is it your expert opinion
20 that the Facebook user IDs of everyone whose
21 actions had created an ENT share from a private
22 message constitutes a list of every member of
23 the proposed class and known nonclass members?

24 A. I'm just thinking through that.

25 I -- I do understand the question.

1 Q. Yeah, yeah. Take your time.

2 A. Just let's me repeat it so I'm --
3 I'm answering correctly.

4 If we have the Facebook IDs of all
5 the people who have sent the message that makes
6 this object, is that enough to identify the
7 members of the class?

8 Q. Yeah. I think that's basically it.

9 A. I think that's right then.

10 Q. Well, although I should add, I mean
11 because the class also includes people who've
12 received messages with URL -- with URLs in
13 their content and from which a URL attachment
14 was generated.

15 So how would you identify those
16 people?

17 A. The people who had received the
18 message?

19 Q. Yeah.

20 A. So if you have it, I would want to
21 look at it to make sure -- to look at this --
22 at the ENT share objects to see if the
23 recipient's listed in there. I just don't
24 recall if the recipient is or not. And I
25 obviously don't have that in the report here.

1 MR. JESSEN: Let's take a look at
2 one. We'll mark this as Exhibit 5.

3 (Deposition Exhibit 5 was marked for
4 identification.)

5 THE WITNESS: Thank you.

6 MR. JESSEN: Oh. I'm sorry. Can we
7 swap that out? I'm sorry. I gave you the
8 wrong one.

9 MR. RUDOLPH: Okay.

10 BY MR. JESSEN:

11 Q. Okay. So this -- what's -- the
12 court reporter's handed you Exhibit 5, which is
13 a document with the production numbers FB 6038
14 to 6084.

15 This is -- I'll just represent is an
16 ENT share for a particular URL share.

17 Just take a look, and let me know if
18 you can -- you're able to identify the
19 recipient.

20 A. Thank you.

21 So trying to go through this
22 quickly, I don't see the recipient --

23 MR. RUDOLPH: Don't -- okay.

24 THE WITNESS: -- listed here.

25 BY MR. JESSEN:

1 Q. I didn't see it either when we went
2 through it earlier.

3 A. So if -- given that that's the case,
4 the code examples that I have here would
5 retrieve the senders of those messages.

6 Q. Uh-huh.

7 A. From there, because we have
8 information about -- about the message itself,
9 and as you mentioned, there are objects created
10 that represent the message in addition to
11 representing --

12 Q. Uh-huh.

13 A. -- the attachment, you should be
14 able -- there would be an extra step required
15 beyond what I have here to identify the
16 recipients. But you should be able to go from
17 this data to then the recipients of the
18 messages with an additional step.

19 Q. What do you think that additional
20 step would entail?

21 A. So you'd modify these slightly so
22 that, instead of just selecting the ID of the
23 person who's -- who was the creator in that ENT
24 share object, you would retrieve the
25 message and -- you know, I haven't looked at

1 this structure -- at the data structure for
2 storing the message.

3 But -- but certainly one way or
4 another will get you to the recipient because
5 you can see that in your messages folder,
6 right? Like you can go through and actually
7 look at those messages and see that you sent it
8 to a recipient or vice versa and if the
9 attachment is there.

10 Q. Is that similar to the
11 self-identification mechanism you -- you also
12 propose in this?

13 A. Well, self-identification you'd have
14 to ask -- you know, people would be doing it
15 themselves. This could be done automatically
16 with code.

17 Q. By Facebook --

18 A. By --

19 Q. -- or --

20 A. -- Facebook.

21 Q. You're saying looking -- actually
22 looking in people's inboxes to see if the URL
23 attachment was visible?

24 I mean is that -- forgive me if I
25 got it wrong, but is that what you're

1 proposing?

2 A. No, no, no. I'm just saying the
3 fact that -- so you, for example, or I can go
4 to our messages folders on Facebook --

5 Q. Right?

6 A. -- and retrieve any of those
7 messages shows that the data is stored
8 together, the sender, the recipient and the
9 message ID.

10 So certainly you could self-identify
11 that way. But because we know that data is
12 connected -- it has to be for Facebook to be
13 able to display it -- you could use this method
14 to select the people who had sent those
15 messages and the message IDs, and from there,
16 because we know they're all connected, identify
17 the recipients of those messages that had the
18 attachment.

19 Q. Would the search -- would the
20 results of the query that you discuss in sort
21 of Paragraphs 103 and 104, would that identify
22 share object -- user-specific share objects
23 associated with deleted messages or deleted
24 accounts?

25 A. I'm not sure about either. I'm not

1 sure what Facebook deletes. So if you delete
2 your Facebook account, generally, the last I
3 checked, Facebook did not actually delete the
4 data with your account. So you could come back
5 a year later and --

6 Q. Uh-huh.

7 A. -- sign up again, and everything you
8 had done would be there. So I haven't looked
9 at depth into this, but I believe that those
10 messages would be there also.

11 As for deleted messages, I'm not
12 sure. I haven't looked at what the process is,
13 like if Facebook gets rid of these ENT shares
14 if someone deletes a message or not.

15 Q. Would the results of your query
16 identify messages with URL share attachments
17 that were blocked by site integrity processing?

18 A. So my understanding -- and -- and
19 this could have changed over time -- is that
20 Facebook won't actually carry -- follow through
21 with this process if the URL is blocked.

22 Q. The process -- what process?

23 A. Of creating --

24 Q. Of creating the --

25 A. -- the objects.

1 Q. Okay. Would the results of your
2 query identify messages with URL share
3 attachments that did not result in the creation
4 of a share object for one reason or another?

5 A. Like in the case of these code
6 errors?

7 Q. Yeah. Sure.

8 A. Then I think it would not if -- I'm
9 sorry. Just so -- repeating this.

10 If -- if there was a URL in the
11 message but the -- and there was a URL
12 attachment but the ENT share object did not get
13 created?

14 Q. Correct.

15 A. Okay. It would not identify that
16 then.

17 I think would be okay actually,
18 because if that object doesn't get created, the
19 person probably isn't a member of the class.

20 Q. Uh-huh. You don't have any way, I
21 gather, of identifying Facebook users who type
22 the URL into the text of a message, had a URL
23 preview generated, and then deleted that
24 preview before they sent the message, correct?

25 A. That's correct. I don't know how

1 you would know that.

2 Q. Okay. And your query "quode" --
3 excuse me. Pardon me.

4 Your query code in Paragraph 104 is
5 based upon the attributes you identify in
6 Paragraph 99, correct?

7 A. That's correct.

8 Q. And in Paragraph 99 you say that
9 certain attributes show that a given ENT share
10 was created from a private message, correct?

11 A. Yes.

12 Q. Okay. So if these attributes are
13 under- or over-inclusive of members of the
14 purported class, the resulting list from your
15 query will similarly be over- or
16 under-inclusive, right?

17 MR. RUDOLPH: Objection. Form.

18 THE WITNESS: If they were, I think
19 that would be true.

20 BY MR. JESSEN:

21 Q. And I gather -- do -- do these
22 messages -- I'm sorry. Pardon me.

23 Do these attributes identify only UR
24 -- URL shares in messages or other kinds of
25 shares for messages?

1 A. Only URL shares.

2 Q. Did these attributes identify only
3 messages with a URL in their text?

4 MR. RUDOLPH: Objection. Form.

5 THE WITNESS: I believe it's the
6 case that this is actually based on the
7 attachment and not on the text of the message.

8 BY MR. JESSEN:

9 Q. Okay. So this could include a
10 message that -- like if I type in a URL and
11 then a preview is generated, and then I delete
12 the URL but I keep the preview and send it,
13 that would -- that would pick up that
14 message --

15 A. That's right.

16 Q. -- as well, right? Okay.

17 Do these attributes -- strike that.

18 There was a period of time -- and
19 this is discussed in Alex Himel declaration --
20 when you could go to a Like button social
21 plug-in on a third-party Web site, and one of
22 the options was you could click "Share in
23 private message."

24 A. Yes.

25 Q. And then from there you could -- you

1 could -- you could share the URL in a message.

2 Do you know if -- if the -- your --
3 the attributes that you identify would pick up
4 those kinds of shares?

5 A. So I'd want to go back and -- and
6 revisit Himel. But I believe it's the case
7 that they would. I believe that -- that those
8 -- because I kind of remember them making a
9 point about this.

10 Q. Uh-huh.

11 A. I believe it's the case that those
12 share and private message messages were treated
13 the same way in the data. But it's not in
14 here, so I'd want to confirm that --

15 Q. Okay.

16 A. -- to be sure.

17 Q. Do these attributes -- these four
18 attributes, do they identify only messages
19 including a nonFacebook URL?

20 A. That's correct. This is only
21 nonFacebook URLs.

22 Q. Do these attributes distinguish
23 between messages whose senders are physically
24 located in the United States and others?

25 A. These attributes do not make that

1 distinction.

2 Q. Do these attributes distinguish
3 between URLs shared in private messages before
4 December 30th, 2011, and those shared after
5 December 30th, 2011?

6 A. The attributes in Paragraph 99 don't
7 address the date.

8 Q. Do these attributes identify URL
9 message shares that were logged in any way to
10 Nectar?

11 A. So the queries that I have using
12 these --

13 Q. Uh-huh.

14 A. -- are on the ENT share objects.
15 They're not on the Nectar data. So if there
16 was -- if there were a case where there were
17 not overlap there, it was -- I don't -- I don't
18 know if this could be the case. I'd have to
19 think harder about it.

20 But hypothetically, if it were
21 logged to Nectar and not in an ENT share or the
22 reverse, if they didn't match, then you'd be
23 missing one or the other. You'd be -- you'd be
24 missing what's in Nectar.

25 Q. Right.

1 So these attributes, they -- you
2 couldn't tell from these attributes whether the
3 URL message share was logged to Nectar; is that
4 accurate?

5 A. So you're -- I'm not querying
6 Nectar. So --

7 Q. Right?

8 A. -- you know, if that were the
9 question that I would ask --

10 Q. Uh-huh.

11 A. -- that I were asked, I'd actually
12 want to go back to the code a little bit to --
13 to connect the Nectar logging process with this
14 to kind of see exactly where the dependencies
15 and connections are. But certainly this is not
16 querying Nectar with these properties.

17 Q. Okay. Do these attributes identify
18 URL message shares that resulted in an
19 increment in the [REDACTED] table?

20 A. Again, this is not querying the
21 [REDACTED] table.

22 Q. Got it.

23 A. But this is a code connection
24 between the creation of the objects this would
25 identify and that incrementing.

1 Q. What's that code connection?

2 A. Like do you want specific lines?

3 Q. No, but just in general.

4 A. So there --

5 Q. If you remember.

6 A. There are lines of code. So I -- I
7 know I have -- I was just looking at it. There
8 are lines of code that do the logging for the
9 [REDACTED] table that's connected to this.

10 Q. Okay.

11 A. Theoretically it's possible, but
12 they could be different for some of these
13 errors. But again, this is querying the ENT
14 shares; it's not querying [REDACTED]

15 Q. Right.

16 Do these attributes identify URL
17 message shares that were utilized by Taste?

18 A. It does not.

19 Q. Do these attributes identify URL
20 message shares that were displayed in any
21 recommendations plug-in?

22 A. Does not.

23 Q. Do these attributes identify URL
24 message shares that were displayed in any
25 activity feed?

1 A. No.

2 Q. Do these attributes identify URL
3 message shares that were included in data from
4 any API available to third parties?

5 A. It does not uniquely identify those,
6 no.

7 Q. Do these attributes identify URL
8 message shares that were reflected in Insights
9 data?

10 A. No.

11 Q. What about demographic data made
12 available to third parties?

13 A. No. I mean in all cases these
14 things certainly could have been used this way.
15 But they're not distinguished in the query
16 here.

17 Q. They could have been, sort of a
18 case-specific issue.

19 A. I think that's right.

20 Q. Yeah. So I just have a few more
21 along this same lines.

22 A. Sure.

23 Q. Do these attributes identify URL
24 message shares that resulted in any increment
25 in the Like counter on a third party Web site?

1 A. I just want to make sure -- I know
2 you've given me a bunch of these questions --
3 just so I'm answering them correctly. So these
4 are only going to identify ENT share objects.

5 Q. Understood.

6 A. All these things that you're asking
7 about, as I'm agreeing that they're not shown
8 there, is that that data's not connected to
9 these objects.

10 Q. Understood.

11 A. Okay.

12 Q. And I've only got a couple more.

13 And I'm sorry --

14 A. Okay.

15 Q. -- it's a little repetitive.

16 A. No. I just wanted to make sure,
17 when I say no, it doesn't show up there, that
18 we're -- that I'm answering --

19 Q. Yeah?

20 A. -- within your asking.

21 Q. Yeah. I'm just trying to understand
22 exactly what your -- what these attributes
23 would identify and what they -- what they
24 wouldn't.

25 A. Okay.

1 Q. So these attributes wouldn't
2 identify whether or not a message share had
3 resulted in an increment in a Like button
4 social plug-in counter on a third-party Web
5 site.

6 A. Correct.

7 Q. Okay. Do these attributes
8 distinguish between messages whose senders or
9 recipients are natural persons and those that
10 are not?

11 A. That can be kind of a very
12 philosophical question.

13 Q. Especially since you study
14 artificial intelligence.

15 A. Yeah. I mean that's the thing,
16 right? If -- so Facebook doesn't want you to
17 have bots with accounts, right, artificial
18 intelligence with accounts --

19 Q. Uh-huh.

20 A. -- and would block those.

21 But, you know, if it didn't know if
22 I had written a bot to do that, since Facebook
23 has no way of distinguishing that, even though
24 they technically don't allow it, it wouldn't
25 distinguish. That's assuming, you know, people

1 are violating those terms of Facebook.

2 Q. Okay. I just want to make sure I
3 heard you correct.

4 You -- you say it wouldn't
5 distinguish.

6 A. Correct. So if I signed up a bot,
7 Facebook --

8 Q. Right.

9 A. -- didn't know it was a bot, and it
10 --

11 Q. Right.

12 A. -- started sending private messages,
13 you wouldn't be able to distinguish that.

14 Q. Do these attributes distinguish
15 between messages sent by Facebook users and
16 those that were sent by nonFacebook users?

17 A. I don't think you could send one of
18 these messages if you weren't a Facebook user.

19 Q. Do these attributes distinguish
20 between messages whose users knew about and
21 consented to the alleged interceptions?

22 A. I don't know how anyone would have
23 known about and consented to the interceptions.

24 Q. But -- okay. But it's possible that
25 someone could have, right?

1 A. Yeah. Like I guess if Facebook
2 engineer would have known this was happening,
3 this would identify the Facebook engineer even
4 if he or she had consented. But it's easy to
5 filter out manually --

6 Q. But you --

7 A. -- afterwards.

8 Q. -- you could tell -- these
9 attributes wouldn't tell you -- and I --
10 consent is a -- is an issue that the Court will
11 decide.

12 But you couldn't tell -- you could
13 get a list of people who had sent messages
14 containing URL shares, but these attributes
15 aren't going to tell you which of those users
16 consented to the conduct that you're
17 complaining about, right?

18 MR. RUDOLPH: Objection. Calls for
19 legal conclusion.

20 THE WITNESS: Short of making a
21 legal conclusion, yes, because consent is just
22 not recorded.

23 BY MR. JESSEN:

24 Q. Say that -- consent is not recorded?

25 A. Yes. This is all accessing data

1 that Facebook has recorded.

2 Q. Oh, I see.

3 A. They haven't --

4 Q. Oh, I see.

5 A. -- recorded if I know about it or
6 have consented. So these attributes wouldn't
7 pull that out.

8 MR. JESSEN: I see what you're
9 saying. Okay.

10 I think we have maybe five minutes
11 left.

12 THE VIDEOGRAPHER: You've six
13 minutes.

14 MR. JESSEN: Six?

15 If you guys just give us like five
16 minutes, we'll look through our notes, figure
17 out...

18 THE VIDEOGRAPHER: Off the record at
19 6:19.

20 (A short recess was taken.)

21 THE VIDEOGRAPHER: On the record at
22 6:38.

23 BY MR. JESSEN:

24 Q. Dr. Golbeck, you have some
25 statements in your report regarding your view

1 that if Facebook Message is delivered when it
2 reaches HBase and is in persistent storage at
3 that time.

4 You remember that?

5 A. Yes.

6 Q. Okay. If Facebook created
7 user-specific share objects based on URL share
8 attachments in private messages, after the
9 message and the attachment had reached HBase,
10 would you consider that to be an interception?

11 MR. RUDOLPH: Objection. Form.

12 THE WITNESS: Certainly not as I've
13 analyzed it here.

14 BY MR. JESSEN:

15 Q. Okay.

16 A. You know, it's a hypothetical. It
17 seems like probably not, but I would want to
18 see the actual details of -- of what's
19 happening in the process to be sure.

20 Q. I gather you still would view that
21 as a privacy violation?

22 MR. RUDOLPH: Objection. Form.
23 Incomplete hypothetical.

24 THE WITNESS: I -- personally I
25 would, yes.

1 BY MR. JESSEN:

2 Q. Yes. Okay.

3 Do you think that you're more
4 privacy sensitive than a lot of people?

5 MR. RUDOLPH: Objection. Form.
6 Vague.

7 THE WITNESS: I don't think so. I
8 think I'm more privacy invasion aware than most
9 people.

10 BY MR. JESSEN:

11 Q. Okay.

12 A. But when I talk to people about the
13 things that I view as privacy invasions that
14 are happening that not --

15 Q. Right.

16 A. -- everybody knows about, they tend
17 to be as spooked and appalled as I am.

18 Q. Do they alter their conduct
19 typically after learning of these practices?

20 MR. RUDOLPH: Objection. Form.
21 Calls for speculation. Lacks foundation.

22 THE WITNESS: So I -- you know, I
23 can't really know. But when I do go and give
24 these talks that I mentioned to you, I show
25 this video called "Take This Lollipop," which

1 you should try if you never have. Makes a
2 creepy Facebook stalker guy look at your
3 profile.

4 And I always get lots of people
5 saying, "I'm just going to go delete my
6 Facebook account right now," which is not a --
7 really a Facebook issue, and it certainly
8 doesn't have to do with private messages.

9 But yeah. People -- I think, when
10 they find out about privacy issues like this,
11 definitely contemplate changing their behavior.
12 Whether they do is a question because there's
13 not a lot of alternatives other than totally
14 opting out of online life.

15 BY MR. JESSEN:

16 Q. Let's go back to the section on
17 ascertainability. I want to just ask you a
18 couple of questions about -- you say in
19 paragraph 105 on Page 29: "If database queries
20 were not an option, direct code could be
21 written to access the data."

22 And then you say: "For each share
23 object, something like the following checks
24 would determine if it were a share generated
25 from that private message."

1 See that?

2 A. Yes.

3 Q. I just want to understand exactly
4 what -- what -- exactly what are you proposing
5 there?

6 Like are you proposing a -- a manual
7 look-up process for every share object?

8 A. Certainly not manual. It would be
9 code.

10 Q. Okay.

11 A. So one could, for example, get a
12 list of all the ENT share objects, loop through
13 them with this query, which would identify
14 those that were created from private messages.

15 Q. How is it -- how is it different
16 from what you were proposing in your query --

17 A. So the --

18 Q. -- code?

19 A. -- the foundation of it --

20 Q. Yep?

21 A. -- is essentially the same.

22 Q. Uh-huh.

23 A. Paragraph 104 is SQL, S-Q-L, code.
24 Paragraph 105 is roughly PHP code.

25 Q. Uh-huh.

1 A. So it's just a matter of is it a
2 query you would make in a database because the
3 data's accessible in that way.

4 Q. Right.

5 A. Or is it one that you would write
6 separate code for.

7 Q. Do you know -- you have any sense
8 for how much time and effort it would take to
9 generate these -- these lists of proposed class
10 members?

11 A. From a programming perspective or a
12 computational time perspective?

13 Q. Let's do both.

14 A. So I -- I have no idea how long it
15 would take to run this --

16 Q. Uh-huh.

17 A. -- just because Facebook has a
18 pretty sophisticated C loud-based architecture.

19 Q. Yeah.

20 A. So it'd be a lot different than me
21 running it on my computer.

22 Generating the code, you know, the
23 core of it would be very fast, you know,
24 something you can do in a few minutes.
25 Actually implementing it so it would run, you

1 know, it should take somebody a day or two to
2 kind of work out all the bugs and -- and --

3 Q. Okay.

4 A. -- figure it out. It shouldn't take
5 -- for a competent Facebook engineer, it
6 shouldn't take an inordinate amount of time.

7 MR. JESSEN: Okay. I don't have any
8 further questions at this time.

9 I would renew my request for those
10 three e-mails between Dr. Golbeck and the
11 plaintiffs' counsel before she was engaged.

12 MR. RUDOLPH: We're -- we're going
13 to have to get back to you on that.

14 MR. JESSEN: Okay. And I'll just --

15 MR. RUDOLPH: Haven't had have time
16 to -- to look into it.

17 MR. JESSEN: Even though I think
18 it's unlikely I would bring you back, I will
19 just reserve my right to bring you back if need
20 be.

21 THE WITNESS: For the 15 seconds
22 that we have left on the record. That'd be
23 fun.

24 MR. JESSEN: They might --

25 THE WITNESS: I'll totally do 15

1 seconds.

2 MR. JESSEN: They might give me
3 another -- you know, little -- little bit --
4 but hopefully that won't be necessary.

5 THE WITNESS: There -- there's
6 nothing too exciting in those e-mails. So...
7 No. I know. I shouldn't talk about any of the
8 communications.

9 MR. JESSEN: Well, thank you for
10 your time. Happy birthday.

11 THE WITNESS: Thank you.

12 MR. JESSEN: And I have no further
13 questions.

14 MR. RUDOLPH: Yeah. No questions.

15 THE VIDEOGRAPHER: Off the record at
16 6:44.

17 This is the end of Media Unit 4 and
18 the end of the deposition.

19 (Whereupon, the proceeding was
20 concluded at 6:45 p.m.)

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CERTIFICATE OF NOTARY PUBLIC

I, Bonnie L. Russo, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; that the testimony of said witness was taken by me in shorthand and thereafter reduced to computerized transcription under my direction; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of the action.



Notary Public in and for
the District of Columbia

My Commission expires: June 30, 2020