

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA, ET AL.,	)	
	)	
Plaintiffs,	)	
	)	
vs.	)	CV No. 20-3010
	)	Washington, D.C.
	)	October 4, 2023
GOOGLE LLC,	)	9:30 a.m.
	)	
Defendant.	)	Day 16
_____	)	Morning Session

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

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WITNESS INDEX

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WITNESSES	DIRECT	CROSS	REDIRECT	RECROSS
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PLAINTIFF'S:

ADAM JUDA	4088	4192		
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## 1 P R O C E E D I N G S

2 COURTROOM DEPUTY: All rise. The Honorable  
3 Amit P. Mehta presiding.

4 THE COURT: Good morning. Please be seated,  
5 everyone.

6 COURTROOM DEPUTY: Good morning, Your Honor.  
7 This is Civil Action 20-3010, United States of America,  
8 et al., versus Google LLC.

9 Kenneth Dintzer for the DOJ Plaintiffs.

10 William Cavanaugh for Plaintiff States.

11 John Schmidtlein on behalf of Google.

12 THE COURT: All right. Good morning, everyone.  
13 It's nice to be with all of you.

14 So are we ready to continue with Mr. Juda.

15 MR. DAHLQUIST: We are.

16 We understand Google had something they wanted to  
17 put on the record.

18 MR. SCHMIDTLEIN: We'll decide it later.

19 This has to do with Professor Whinston's testimony  
20 tomorrow and a *Daubert* motion we had filed directed to that,  
21 but we can address that later.

22 THE COURT: Okay.

23 MR. DAHLQUIST: Good morning, Your Honor.

24 David Dahlquist again on behalf of the United States.

25 THE COURT: All right. Mr. Juda, good morning,

1 and welcome back.

2 THE WITNESS: Good morning. Thank you.

3 THE COURT: All right. Mr. Dahlquist, when you  
4 are ready.

5 MR. DAHLQUIST: Thank you, Your Honor.

6 - - -

7 ADAM JUDA, WITNESS FOR THE PLAINTIFFS, HAVING BEEN  
8 PREVIOUSLY SWORN, RESUMED THE STAND AND TESTIFIED FURTHER AS  
9 FOLLOWS:

10 DIRECT EXAMINATION (CONTINUED)

11 BY MR. DAHLQUIST:

12 Q Good morning, Dr. Juda.

13 A Good morning.

14 Q I hope you had a good night.

15 Dr. Juda, I'd like to pick up -- well, I'd like to  
16 take a little bit of a step back and rewind because we  
17 covered a lot yesterday, and then we'll continue to move  
18 forward.

19 Yesterday, I think we established that an  
20 advertiser can start to submit an advertisement on Google by  
21 entering info into Google's API. It is information  
22 including a max CPC bid, or a max cost-per-click bid,  
23 correct?

24 A That's one of the things they can submit.

25 Q And with that information, Google's algorithms

1 take the advertisers' bid and try to estimate the quality of  
2 that particular advertisement, correct?

3 A So bid isn't an input into quality, but the ad  
4 associated with the bid will have its quality estimated.

5 Q Let me make sure I understand.

6 The bid, the CPC, the max CPC bid is not an input  
7 into quality?

8 A That is correct.

9 Q But the Google's algorithms try to estimate the  
10 quality of the bid -- I'm sorry, let me restate.

11 The quality of the ad?

12 A Correct.

13 Q Okay.

14 And Google's algorithms try to estimate the  
15 quality of the ad. And they use that quality estimate in a  
16 number of ways, including ranking, correct?

17 A Correct.

18 Q And yesterday the Court asked a question about a  
19 quality score of -- a 1 through 10 quality score that we  
20 saw, and that is an -- that's information -- quality  
21 information that's given to an advertiser, correct?

22 A Correct.

23 Q But the 1 through 10 score is not actually used in  
24 the quality computation used inside of the Google algorithm,  
25 correct?

1           A     That is correct.

2           Q     As the ads are ranked -- or let me take one more  
3 step back. We talked yesterday the ad rank is also known as  
4 an LTV?

5           A     LTV internal, yes.

6           Q     They are overlapping concepts, I think is a term  
7 we talked about, correct?

8           A     That is correct.

9           Q     So we have a bid that goes in, the Google systems  
10 try to estimate the quality of an ad, Google determines an  
11 ad rank and does that through an LTV computation.

12                   Do we agree with that very basic setup of events?

13          A     We do.

14          Q     Now, I think that's where we left off yesterday.  
15 A lot of effort to get to there.

16                   So now we're going to talk more about LTV today.

17                   Yesterday, we talked a little bit about LTV, which  
18 is long-term value, correct?

19          A     That's what it stands for.

20          Q     And I asked you a question of how long are we  
21 talking about, and I think your answer was a steady state,  
22 correct?

23          A     That sounds familiar. I don't remember exactly  
24 what I said.

25          Q     How do you define a steady state?



1           A     So it's a bit of a concept because the system's  
2 very dynamic, so arguably it never truly achieves a steady  
3 state.

4                     But I would sort of think about it as some sort of  
5 answer to a hypothetical of, if nothing were to ever happen  
6 on a going-forward basis when it comes to the inputs that  
7 advertisers were providing, where might user behavior in  
8 response to ads kind of settle down over time.

9           Q     Would you agree, and I pulled up this definition  
10 last night, that a steady state is a condition that does not  
11 change in time or changes negligibly over time?

12          A     That sounds reasonable.

13          Q     Okay.

14                     Another question that we looked at is long-term  
15 value to whom, I think was a question that we asked.

16                     And with respect to that question, let's go back  
17 to a document we looked at, UPX10, should be in your binders  
18 still there, the document binder.

19                     And UPX10 was the paper that was submitted to the  
20 Competition and Markets Authority entitled "How search ads  
21 are ranked and priced."

22                     And again UPX10 is in evidence, Your Honor.

23                     Let me know when you've found that document again.

24          A     I am on UPX10.

25          Q     Great.

1           And sorry we've given you too many waters there,  
2 Dr. Juda.

3           A     Totally okay.

4           Q     We have a surplus of hydration today.

5                     That's an indication of how long the day might be.

6           THE COURT:   That's what I was worried about.

7 BY MR. DAHLQUIST:

8           Q     UPX10, if we can turn to page 6.

9           A     Would that be Bates number 55?

10          Q     Correct.

11                     And let's start at the very, very top.

12                     Yesterday, we looked at an equation that was, and  
13 I don't have this on the screen right now, but it was  
14 basically  $LTV = \text{bid times PCTR} - \text{beta}$ .

15                     Do you remember that equation?

16          A     I do.

17          Q     I want to look at, on page 6, the very, very top,  
18 is this a very -- and it's redacted so we can't read it, but  
19 is this a rudimentary version of that same equation, the LTV  
20 equation?

21          A     I believe it's intended to be so, yes.

22          Q     Okay.

23                     So looking at the very top line, which is public  
24 so I think we can --

25                     Do we have these on the screen? It's not on my

1 screen for some reason. Do we know how to fix that?

2 I apologize. And if not, I can run with it.

3 Thank you very much.

4 Now I know where the "on" button is. Thank you.

5 The very top line says, "Google's LTV algorithms  
6 seek to predict whether or not the benefits of showing a  
7 particular ad will exceed the costs."

8 Do you agree with that statement?

9 A That does appear to be what the document says.

10 Q I agree.

11 You helped draft this document, correct?

12 A I recall having conversations with the document.  
13 I forget how active of a drafter I was in it.

14 Q Okay.

15 You helped to draft at least significant portions  
16 of UPX10, correct, that's what we talked about yesterday?

17 A I'm not sure I recall having that particular  
18 conversation yesterday. I only remember saying that I had  
19 contributed to its authorship or, like, helped, you know,  
20 author it. I don't remember how much of it I had actually  
21 drafted it.

22 Q Let's focus on the statement then. Do you agree  
23 with the first statement that "Google's LTV algorithms seek  
24 to predict whether or not the benefits of showing a  
25 particular ad will exceed the costs." Yes or no?

1           A     That seems fair.

2           Q     And it has the basic LTV formula there.

3                     Moving down to the next full paragraph of text --  
4 I'm sorry, the last full paragraph of text above the other  
5 one that starts, "The predicted benefits."

6                     Do you see that paragraph?

7                     Let me know when you're ready. I'm just going to  
8 ask you about the first sentence real quick.

9           A     Okay. I think I'm ready.

10          Q     The first sentence, or I guess clause, states,  
11 "The predicted benefits to Google of an ad impression are  
12 then offset by the predicted costs to Google of showing the  
13 ad." And let's stop there.

14                     Do you agree with that statement?

15          A     So I think it's probably a bit simplified because  
16 I don't think that the benefits to Google are restricted in  
17 scope to just the first term in the equation.

18          Q     And I agree it's simplified, and I think that's  
19 where we're starting from, that this is a basic explanation  
20 of how the LTV equation works.

21                     Would you agree with that?

22          A     I would.

23          Q     Okay.

24                     And so you would agree that the LTV equation tries  
25 to estimate the predicted benefits to Google offset by the

1 predicted costs to Google, correct?

2 A So as I just mentioned, I think there are some  
3 benefits to Google which are not captured by the equation as  
4 it's expressed. So I think it's capturing some benefits to  
5 Google but not all benefits to Google.

6 Q Okay.

7 There are additional benefits to Google that might  
8 not be fully captured in this paragraph on UPX10?

9 A Less so the paragraph and more so the equation.

10 Q Okay.

11 The equation is an estimate, correct?

12 A It is.

13 Q And so it's an attempt to capture the benefits to  
14 Google and the costs to Google but it may not capture all of  
15 them?

16 A That sounds fair.

17 Q Now, the LTV formula that we're looking at here  
18 does not include -- let me strike that question.

19 The simplified LTV formula that we're looking at  
20 here on page 6 of UPX10 does not include any computation of  
21 benefits to an advertiser, correct?

22 A I disagree.

23 Q The line we just read, the predicted benefits to  
24 Google and the predicted costs to Google, doesn't say  
25 advertisers, correct?

1           A     It does not say the word "advertiser," I agree.

2           Q     And yesterday when we had this discussion, you  
3     stated that you thought there could be long-term gains for  
4     users or advertisers, but that's not part of the equation  
5     that we're looking at at UPX10, page 6, correct?

6           A     I disagree.

7           Q     And when we had this discussion yesterday, you  
8     referenced two formulas, the PCQ and the PLQ?

9           A     I do recall referring to those.

10          Q     Is that what you're referencing with respect to  
11     some -- you think there could be gains for users of  
12     advertisers. Are those embedded in the PCQ and PLQ?

13          A     In part but not only within those signals.

14          Q     Okay.

15                 Looking at this same page 6, the PCQ and the PLQ,  
16     which are important terms to talk about because we're going  
17     to see those a bit more, if you look at the top of the  
18     page 7, and it's redacted so we're not going to read it, but  
19     the formula, again, another but more complex version of the  
20     LTV formula on the top of page 7, would you agree that the  
21     PCQ and PLQ variables are embedded in the beta variable that  
22     we looked at in the very simplified version?

23          A     I would.

24          Q     With that as a baseline, I think we can pick up  
25     back to where we left off. We can go back to --

1           Now, I'd like to talk about how the LTV formula is  
2 used with regard to pricing, and we talked about that  
3 yesterday, that one of the elements, that Google uses  
4 quality through the LTV formula is pricing.

5           Do you remember that discussion?

6           A     I do.

7           Q     And you would agree that Google uses the LTV  
8 formula in pricing, correct?

9           A     I would.

10          Q     So let's look at UPX509, which is where we left  
11 off, which is a memo entitled "How Should AQ, Ads Quality,  
12 Think About Pricing."

13          Let me know when you've found it.

14          A     I have found the document.

15          Q     Great.

16          And we're going to focus on the first page.

17          Under strategic considerations, it says, "Pricing  
18 today."

19          Do you see that?

20          A     I do see that header.

21          Q     The first paragraph states, "If we think of  
22 pricing as the action of defining the cost our advertisers  
23 pay per unit of value (e.g., costs per click or cost per  
24 conversion) then pricing on Google.com happens today in  
25 small touches all throughout the year."

1 Do you agree with that statement?

2 A It's kind of a tricky question to answer because  
3 it's an assertion by the author, and so they presumably have  
4 the right to assert whatever they want.

5 It's not the definition that I would use if trying  
6 to define pricing.

7 Q Okay.

8 This document, UPX509, was a memo that you  
9 reviewed in 2018. I think we looked at the comments before  
10 and that you had a multitude of comments that you made on  
11 this document. Do you recall that?

12 A I recall certainly providing some comments.  
13 I don't know if I would describe them as "a multitude."

14 Q You provided many comments, correct?

15 A I don't think we counted the number of comments,  
16 so I'm not sure if I would classify it as --

17 Q Would you like to count -- how would you like to  
18 describe how many comments you made?

19 THE COURT: Why don't we move forward.

20 MR. DAHLQUIST: We'll move past this point.

21 BY MR. DAHLQUIST:

22 Q In the comments that you made, you didn't make any  
23 comments to page 1?

24 A I'm not sure because all the comments were at the  
25 end, and I didn't see to what pages they were annotated.



1 Q We'll turn to that in a minute.

2 So would you agree -- well, let me move to the  
3 next point then.

4 In the next paragraph it states, "Most AQ" -- that  
5 stands for "ads quality"?

6 A Presumably.

7 Q "Most ads quality launches, in addition to trying  
8 to improve the value for users and advertisers (e.g.,  
9 quality improvements, driving better conversions, new  
10 formats driving higher CTRs, et cetera) have some CPC or CPA  
11 component."

12 Do you agree with that statement?

13 A So the word "component" isn't defined at least  
14 within this sentence. I could probably some come up with  
15 some definitions where that would be true but perhaps other  
16 definitions where that would not be true.

17 Q And let me get to the next sentence, and then I'll  
18 round back to it.

19 "But we'll call this incidental pricing."

20 Do you see that?

21 A I do see that sentence.

22 Q And so taking a step back, the ads quality group  
23 institutes multiple launches throughout a year, correct?  
24 I think we established that yesterday.

25 A Correct.

1           Q     And would you agree the statement is saying that  
2 most ads quality launches have some CPC or CPA component, it  
3 impacts pricing in some way?

4           A     So I agree that it is unlikely for most launches  
5 for there to be zero changes to the totality of CPCs in  
6 place.

7                     I'm not sure I necessarily describe that as a CPC  
8 component, but I agree that it's rare that you could have  
9 identical CPCs heading into and coming out of a launch.

10          Q     A CPC is a cost per click, right?

11          A     Yeah. When I was referring to CPC just then,  
12 I was referring to the individual cost at the individual ad  
13 level that an advertiser would pay if the ad were clicked.

14          Q     And what's a "CPA"?

15          A     Usually that stands for something like cost per  
16 acquisition.

17                     It's more of an aggregated metric from a  
18 nomenclature perspective, and it can reflect a concept like  
19 if an advertiser is reporting the number of sales on their  
20 website that are driven from advertising traffic, you can  
21 compute the total amount in advertising they spent, you can  
22 divide it by the total number of sales, and then you would  
23 get a cost per sale or a cost per acquisition.

24          Q     When Google makes most ad quality launches, it has  
25 some "incidental" impact on CPCs or CPAs, correct?

1           A     So that certainly is what this doc is saying. I'm  
2 not sure, frankly, what the true definition of the word  
3 "incidental" to say if I would sort of consider that myself.

4           Q     Let's go to the next sentence.

5                     "We also directly affect pricing through tunings  
6 of our auction mechanisms, in general through the three  
7 levers that are format pricing, squashing, or reserves.  
8 We'll call this 'intentional' pricing."

9                     Do you agree with those sentences?

10          A     I think no.

11                     Or I don't think it's as straightforward as this  
12 sentence is articulating.

13          Q     In addition -- well, we just talked about  
14 incidental pricing where an ads quality launch may impact  
15 price in some way.

16                     But there's another version of "intentional  
17 pricing," where the Google ads quality team can  
18 intentionally change the price or have an ad quality launch  
19 that is focused on a price, correct?

20          A     So as I just noted, I'm not sure I would  
21 necessarily characterize things that way, but I acknowledge  
22 that the document does.

23          Q     A member of your team characterized it that way in  
24 2018, correct?

25          A     Correct, a relatively junior member of the team

1 characterized it this way.

2 Q On a document that you commented on, correct?

3 A Correct.

4 Q Okay.

5 Let's turn to your comments then. Let me make  
6 sure I have this.

7 Would you agree that some of the ads quality  
8 launches that are done by the ads quality team can directly  
9 impact pricing through tunings of Google's option  
10 mechanisms?

11 A So my concern there, I guess, is with the word  
12 "directly."

13 In my mind, the CPC is the output of the auction.  
14 So we can directly change how the auction works which can  
15 have an outcome of changing the prices. But in my mind  
16 conceptually that doesn't imply that we are directly  
17 impacting the price.

18 Q I believe you're saying is you can directly change  
19 how the auction works which impacts pricing, correct?

20 A Correct.

21 So, for example, if we decide to place a greater  
22 emphasis on quality within a ranking function, that would  
23 sort of be a direct input into the auction. We want to care  
24 more about quality. And in so doing, that could result in  
25 some ads, albeit not all ads, experiencing a change in price

1 that could go up or down, which then an aggregate could  
2 cause the overall average prices to go up or down.

3 Q And we're going to talk about this a lot today.  
4 And if we need to specify today, we can; but I'm going to  
5 ask a lot about on average. I understand some go down, some  
6 go up, but on average, that's what my questions are going to  
7 be focused on.

8 And so returning back to the last line here on  
9 UPX509 here, it's on the screen in front of you, would you  
10 agree that in general or on average, you have three levers,  
11 at least three levers, that you can directly impact pricing?

12 A So as I previously mentioned, in my mind, I don't  
13 necessarily view us as being able to directly impact  
14 pricing.

15 Q Do you agree that Google can directly raise prices  
16 through format pricing?

17 A No.

18 Q Do you agree that Google can directly impact  
19 pricing through squashing?

20 A No.

21 As evidenced by the fact that I believe when we  
22 launched that, 40 percent of the CPCs went down rather than  
23 up.

24 Q We're going to get into some of those details  
25 today.

1           If we can stay on this document, page 509 -- or  
2 UPX509 at 2870, which I think is the next page in.

3           A     I'm sorry, 2870?

4           Q     Correct.

5           Sorry. Hang on. Let me make sure I get you to  
6 the right place.

7           Actually, we're going to go look at one of your  
8 comments on page -- all the way in the back, UPX509 at  
9 874-002.

10           And do you see -- look towards comment 15 which is  
11 a comment from you.

12           Let me know when you're there.

13           A     I'm there.

14           I'm currently reading the comment.

15           Q     Sure.

16           A     Okay.

17           Q     At UPX509, at 874-002, do you see your comment?  
18 I think it's marked as comment 15.

19           A     I do.

20           Q     And this is a comment you made to the second page,  
21 if you need to reference it, of the memo.

22           And you state, "I wonder how much value plays into  
23 this in reality."

24           Do you see that statement?

25           A     I do.

1           Q     And you say, "For example, I think there's a  
2 belief that when auctions become thicker and increase  
3 prices, that might be safer than raising the prices in a  
4 thin auction, because in the former we are likely closing in  
5 on the 'actual' value of the click; whereas in the latter  
6 prices might exceed the true value."

7                     Do you agree with your statement?

8           A     I don't think this is a technically accurate  
9 statement.

10          Q     You made this statement on January 30th, 2018,  
11 correct?

12          A     It appears so.

13          Q     And maybe let's take a step back.

14                     Do you agree that thicker auctions -- a thicker  
15 auction is when there's more bidders, correct?

16          A     Yeah.

17                     Or I would probably say maybe a little bit more  
18 refined.

19                     More bidders who are able to participate in the  
20 auction.

21          Q     And in search ads more bidders means more auction  
22 competition, correct?

23          A     Sounds right.

24          Q     And more auction competition on average leads to  
25 higher prices, correct?

1           A     So I can certainly think of examples in both  
2 directions.

3                     I haven't run statistics on this. It sounds  
4 plausible that that is true, but I can't say so  
5 definitively.

6           Q     And, again, I understand that there can be,  
7 I think you said, Edge cases, there can be exceptions, but  
8 on average when you have more participants in an auction,  
9 prices go up?

10          A     They don't have to.

11                     You know, you could imagine an instance where if a  
12 new advertiser enters the auction, they may have an  
13 unusually low bid but absolutely outstanding quality such  
14 that they win the auction in that instance.

15                     It's quite possible that their CPC is going to be  
16 lower than all of the other previous auction participants  
17 and so the CPCs would actually be going down in that  
18 instance rather than up.

19          Q     And Google's estimate of quality that you just  
20 referenced for a high quality bid would be entered into the  
21 LTV calculation, correct?

22          A     I'm sorry. Can you ask the question again.

23          Q     Certainly.

24                     You just had an imaginary case where the quality  
25 of an ad is so superior that it didn't cause the price to go



1 up but went down. But that quality measurement is  
2 computed as part of the LTV equation that we've been  
3 talking about today, correct?

4 A That is correct.

5 Q And a thin auction is one in which there's only a  
6 few bidders, perhaps only one bidder, correct?

7 A That has made it to the auction stage, yes.

8 Q And your statement here says that you think it's  
9 safer to raise prices in a thick auction with more bidders  
10 than a thin auction, correct?

11 MS. WASZMER: Objection, Your Honor. Misread the  
12 document.

13 MR. DAHLQUIST: I can restate the question,  
14 Your Honor.

15 THE COURT: If you would, please. Thanks.

16 BY MR. DAHLQUIST:

17 Q Dr. Juda, would you agree that it's safer to raise  
18 prices in a thick auction as opposed to a thin auction?

19 A So I think the challenge there is an implication  
20 that we have the ability to just sort of systemically raise  
21 prices, which I don't think we have.

22 Q You do it through part of the ad auction process,  
23 correct?

24 A So, again, I think even that through statement is  
25 a little bit too particular.

1           We make changes to the auction, and the outcome of  
2 the auction can be a change in prices either up or down, but  
3 we can't, for example, dictate to the auction that prices  
4 should go exclusively up.

5           Q     Google has made ad launches that have impacted the  
6 pricing of search ads, correct?

7           A     That's correct.

8           Q     And Google has used launches to increase ad prices  
9 because it believed that the cost per click was unusually  
10 low, correct?

11          A     So there's a -- there's a level of granularity  
12 that makes that question sort of non-trivial to answer.

13                 There certainly have been launches where the net  
14 aggregate outcome of the launch is that CPCs were higher  
15 after the fact rather than before the fact.

16          Q     Sir, would you agree that -- let me strike the  
17 question.

18                 You have described ad launches at Google that  
19 raise prices where the new prices are higher than the old  
20 ones as more fair to Google, correct?

21          A     I don't believe that's what I said.

22          Q     Let me ask it one more time.

23                 Would you agree that Google can raise prices and  
24 that in coming up with better prices that are more fair to  
25 Google where those new prices are higher than the previous

1 ones?

2 A So as I previously mentioned, I think this notion  
3 of, like, Google's ability to just systemically raise  
4 prices, isn't available which in my mind negates the rest of  
5 the sentence that you just said.

6 Q If I could have you take a look at your  
7 deposition.

8 Page 318.

9 THE WITNESS: Excuse me, sir. Am I allowed to use  
10 this shelf as well?

11 THE COURT: Sure.

12 THE WITNESS: Thank you.

13 MS. WASZMER: Counsel, which date are you going to  
14 go?

15 MR. DAHLQUIST: Certainly.

16 October 14th, 2021, page 318, line 3, to 318,  
17 line 8.

18 THE WITNESS: Could you repeat those pages for me,  
19 please?

20 BY MR. DAHLQUIST:

21 Q Certainly.

22 October 14th, 2021, line -- or page 318, 318,  
23 line 3, through 318, line 8.

24 Let me know when you're there, page 318.

25 A I'm on 318. And you said line 3?

1 Q Line 3.

2 Sir, on October 14th, were you asked the following  
3 question and did you give the following answer?

4 "Question: So, yes, ads quality sometimes does  
5 try and raise prices.

6 "Answer: I would describe it less as raising  
7 prices and more coming up with better prices or more fair  
8 prices, where those new prices are higher than the previous  
9 ones."

10 Did you give that answer to that question, sir?

11 A It would appear so.

12 Q Thank you.

13 You can close your deposition.

14 MS. WASZMER: Your Honor, just to flag, I think  
15 yesterday the Court asked for us not to be reading testimony  
16 where the witness had not been impeached. I do not believe  
17 that was inconsistent.

18 MR. DAHLQUIST: I was reeding that for  
19 impeachment, Your Honor. I believe it was proper  
20 impeachment. We can move forward though.

21 THE COURT: That's what I understood counsel to be  
22 trying to do so I didn't think it was at odds with what we  
23 talked about yesterday.

24 Go ahead.

25 MR. DAHLQUIST: Thank you, Your Honor.

1 BY MR. DAHLQUIST:

2 Q Google has implemented --

3 Hang on, let me make sure I was done with UPX509.

4 I think we're done with 509, we can take that  
5 down. Thank you.

6 Google has implemented ad launches that have  
7 increased Google's revenue, correct?

8 A I believe so.

9 Q And you're familiar with the concept of tuning in  
10 regards to Google's ad auction process, correct?

11 A I believe so.

12 Q And you defined a tuning as a mechanism by which  
13 the weights in the auction function are adjusted.

14 Would you agree on that?

15 A That sounds reasonable to me.

16 Q Tunings can impact pricing, correct?

17 A They can.

18 Q Let's look at a document, UPX43, which should be  
19 in your binder as well.

20 And the document UPX43 is titled "Tuning for  
21 smarties, (ads quality). We're no dummies."

22 Do you see that.

23 A No. Maybe I'm on the wrong --

24 Q Oh, sure. UPX43.

25 And there's a cover email which I'm not going to

1 dwell on, I'm going to the attachment.

2 A Okay. My apologies. I was on the email.

3 Q You can skip the email for now. Let's go to Bates  
4 stamp 580.

5 A Okay.

6 Q Do you recall this presentation, "Tuning for  
7 smarties, (ads quality): We're no dummies"?

8 A Not at first blush, no.

9 Q Google impacts pricing at ad auctions through  
10 tunings, correct?

11 A That sounds correct.

12 Q Let's go to the, let's see, next page, Bates stamp  
13 581.

14 And this is "Tunings in a nutshell:

15 1, measure things. 2, do math. 3, profit."

16 Do you see that?

17 A I do see that.

18 Q Google can achieve increased profits through  
19 tunings, correct?

20 A The answer to that is probably a function of the  
21 time duration over which one is looking.

22 Q And as we talked about with the LTV equation, the  
23 goal of the LTV equation is have it steady state, correct,  
24 over the course of time?

25 A That is correct.

1 Q Let's turn to the next page, Bates stamp 582. The  
2 heading states, "What are we tuning again? Prices."

3 Do you see that heading?

4 A I do.

5 Q The third bullet says, "Tuning is just adjusting  
6 ranking/pricing."

7 Do you agree with that?

8 A I don't think I do.

9 Q And in this document, the confidential portions  
10 that are redacted are the detailed computations that are  
11 part of the ad -- search ad's algorithmic process, correct,  
12 or at least components of it, would you agree?

13 A Some of these might be dated, but otherwise  
14 I think probably for that moment in time, this seems  
15 correct.

16 Q Would you agree that the LTV formula can be tuned?  
17 Would you agree with that general statement?

18 A I do.

19 Q Google can adjust the CPCs through the tuning  
20 process, correct?

21 A There, I don't think the relationship is as direct  
22 as you stated.

23 Q Okay.

24 Let's go to the next page, please.

25 The title is "Long term value function, Roman I."

1 Do you see that statement?

2 A I do.

3 Q And it states, "A tuning equals equals adjusting  
4 the cost of different types of clicks and impressions."

5 Do you see that statement?

6 A I do.

7 Q Let's do another. Thank you.

8 Would you agree that Google can indirectly affect  
9 CPC pricing through a tuning?

10 A It depends on the particular set of conditions.  
11 It can be possible.

12 Q Let's go to UPX889.

13 And this document is titled "Adventures in  
14 pricing."

15 Let me know when you're there.

16 A I am there.

17 Q UPX889, again, I think this is a familiar name.  
18 Who is JF Crespo?

19 A JF is an engineering director on the auction team.

20 Q He's part of your ads quality auction team,  
21 correct?

22 A I wouldn't necessarily put the possessive as mine,  
23 but certainly a member of the ads quality team.

24 Q Understood. I'm sure he appreciates not a  
25 possessive.



1 THE COURT: I'm sorry to interrupt, Mr. Dahlquist.

2 Can I just ask a question, Mr. Juda?

3 Can you just clarify what -- I think you made a  
4 statement earlier or agreed with counsel's question that  
5 long-term value, or LTV, is an effort to capture or reflect  
6 a steady state over time.

7 Can you explain what you mean by that?

8 THE WITNESS: Sure.

9 So naively one might think that the value of an ad  
10 to Google could be limited by, like, the amount of revenue  
11 it might generate right there in that moment. But I think  
12 we try and take a more holistic assessment of the  
13 contribution of that ad.

14 You can imagine an ad that overpromises and  
15 underdelivers. Maybe it says, you know, "click me and we'll  
16 give you a thousand dollars," and you go to a landing page  
17 and it's not actually going to give you a thousand dollars.

18 That ad would generate some revenue at that moment  
19 in time, but odds are it's going to be terribly  
20 disappointing to the user who clicked on it and that user  
21 may even subsequently say, "Let me stop looking at ads in  
22 the future, let me stop clicking on ads in the future, maybe  
23 I'll even install an ad blocker and just never see ads."

24 So there's this distinction between sort of the  
25 in-the-moment value that an ad may provide, as well as maybe

1 some of the longer term ramifications of an ad, and these  
2 quality components try and capture some of those longer term  
3 effects that you're not going to see in the moment, but,  
4 rather, trying to ask this hypothetical question of where  
5 might users end up in the long run given the quality of the  
6 ads that they're seeing today, and let's try and take that  
7 more holistic perspective into account when evaluating ads.

8 THE COURT: Thank you. I appreciate that.

9 THE WITNESS: You're welcome.

10 BY MR. DAHLQUIST:

11 Q Dr. Juda, I'd like to bring you back to UPX889,  
12 the adventures in pricing document.

13 A I am there.

14 Q If we can turn in a page or two. I'm looking at  
15 Bates stamp 77 3.

16 I'm sorry, 772.

17 Auction recap.

18 A I am on that slide.

19 Q The top header I think we've already established,  
20 Google runs a generalized second price auction. Agreed?

21 A Agreed.

22 Q And then it has five bullet points with some more  
23 detail.

24 At least focusing on the second bullet, "Each  
25 candidate," that's a candidate ad, correct?



1 Do you see that statement?

2 A I do.

3 Q And "vanilla" is -- let me strike that question.

4 Google refers to the LTV equation as the "vanilla  
5 flavor"; is that correct?

6 A It appears to on this slide.

7 Q Have you ever used it -- described it as a vanilla  
8 flavor?

9 A Yeah, I can imagine that.

10 Q The vanilla -- strike that question.

11 The vanilla equation of LTV is the way that Google  
12 impacts price ads through a search ads auction, correct?

13 A Can you repeat the question.

14 Q Certainly. It was not well formulated.

15 Would you agree that the LTV equation is a basic,  
16 or a vanilla way, that Google can impact pricing through the  
17 search ads auction process?

18 A I believe so. I mean -- I think, as noted, there  
19 is no vanilla function in the system. The vanilla here is  
20 just an allusion to the fact that this is a simplified  
21 functional form. So the vanilla equation doesn't do kind of  
22 anything because it's not what we actually use.

23 Q I would never refer to the LTV equation as  
24 vanilla. It's not vanilla to me.

25 However, you and others at Google have described

1 the LTV equation as a basic vanilla flavor of impacting  
2 pricing, correct?

3 A So I believe vanilla here is an allusion to the  
4 fact that this is a simplified functional form, rather than  
5 the fully enumerated function.

6 Q And this is a simplified equation, agreed?

7 A Correct.

8 Q Let's go to the next page. 783.

9 A Did you say 783?

10 Q I apologize. We're jumping a couple pages.  
11 Page 783. The title is "When vanilla pricing may no be  
12 sufficient." I think that's probably a typo, means "may not  
13 be sufficient"?

14 A That would be my inference.

15 Q So at times, "vanilla pricing through LTV may not  
16 be sufficient," would you agree?

17 A I'm not sure. I'd probably have to read some more  
18 slides to see what point it's trying to make.

19 Q Okay. You're welcome to look at any of the pages  
20 in here.

21 But I'm going to call your attention to the first  
22 line. It says, "Second pricing" -- and that's the second --  
23 the second price auction process is the reference there,  
24 right?

25 A Presumably.

1 Q "Second pricing works great most of the time, but  
2 there are failure scenarios."

3 Do you see that statement?

4 A I do.

5 Q And it identifies at least two failure scenarios  
6 here. One "where there's weak or lack of auction pressure."

7 Do you see that scenario?

8 A I do.

9 Q And it states, "When no competition is present or  
10 when competition is of inferior quality."

11 Do you agree with that statement?

12 A Would you mind enumerating the statement just to  
13 make sure I know what I'm agreeing to?

14 Q Of course.

15 I'm at the sub-bullet under "weak or lack of  
16 auction pressure."

17 A Right.

18 Q And would you agree that the vanilla pricing  
19 through the LTV equation may not be sufficient when there's  
20 no competition, when it's a thin auction?

21 A I think it would depend on one's definition of  
22 "sufficiency." I think there's some definitions where I  
23 would agree and other definitions where I would disagree.

24 Q Or "Vanilla pricing through the LTV equation may  
25 not be sufficient when the competition is of inferior

1 quality in the ad auction, where an LTV is below zero."

2 A Same answer. It would be a function of one's  
3 definition of sufficiency.

4 Q The second component that it says where "Vanilla  
5 pricing may not be sufficient is reserve pricing."

6 Do you see that heading?

7 A I do.

8 Q And it says, "Reserve prices are generally lower  
9 than their second price counterparts."

10 Do you see that statement?

11 A I do.

12 Q And that means that when the reserve pricing  
13 that's set through the LTV equation, if it's too low, it  
14 might not -- the vanilla pricing might not be sufficient,  
15 correct?

16 A I'm not sure that's what that sentence is saying.

17 Q The next heading or the next statement says, "We  
18 need a way to extract value more directly."

19 Do you see that?

20 A I do.

21 Q And below it states, "We need pricing mechanisms  
22 with pricing knobs."

23 Do you see that?

24 A I do.

25 Q And do you agree that Google has pricing

1 mechanisms with pricing knobs that can extract more value  
2 and more pricing through the search ad auction process?

3 A So the totality of that sentence is not something  
4 that I necessarily agree with.

5 Q Do you agree that Google has pricing mechanisms  
6 that it can use in the search ad auction process?

7 A Yes, the auction itself is a mechanism which  
8 establishes price.

9 Q And would you agree that Google has pricing knobs  
10 that it can use in order to impact pricing through the  
11 search ad auction process?

12 A So pricing knobs is not a concept that I  
13 necessarily use myself, so it probably would depend on what  
14 the author's definition of this term was intended to be.

15 Q You're familiar, members of your team have used  
16 pricing knobs. I think, at least the way I'm reading it,  
17 it's part of the tuning process or part of a tuning  
18 definition?

19 A Plausible but I can't say with absolute certainty.

20 Q Would you agree that the pricing mechanisms and  
21 pricing knobs that are referenced here on UPX889 are  
22 examples of the intentional pricing that we talked about on  
23 the earlier document?

24 A I can't say so definitively.

25 We have two documents with two authors, so



1 I'm not sure they were thinking about each others' documents  
2 when writing their prose.

3 Q So let's stay with this document, that "sometimes  
4 the LTV formula is not enough to impact pricing," and  
5 so this document is looking for pricing mechanisms in order  
6 to directly impact pricing?

7 A I wouldn't agree with that characterization.

8 Q Sorry. I'm going to find a page here real quick.

9 Dr. Juda, can I ask you to turn back a couple  
10 pages to 779?

11 A Sure.

12 Q And this slide is confidential so we're not going  
13 to read -- at least in my -- I think it's -- in my version  
14 it is, so let's make sure it's going to come up redacted or  
15 not.

16 Let's just -- you see 779?

17 A I do see 779.

18 Q Call your attention to the first bullet point.

19 And without reading it --

20 MS. WASZMER: Your Honor, we're just checking to  
21 make sure. We think this is unredacted. If you want to  
22 just go ahead and question while we're checking.

23 MR. DAHLQUIST: Sure.

24 Do we have an unredacted version? Oh, we do.

25 Okay.

1           Let's go ahead and show it. We have it loaded as  
2 that it was unredacted. Okay.

3 BY MR. DAHLQUIST:

4           Q     Dr. Juda, looking at 779, the title is "Auction  
5 Pricing Mechanisms."

6                     Do you see that?

7           A     I do.

8           Q     And the title is -- subtitle is "What are auction  
9 pricing mechanisms designed to do?"

10                    Do you see that statement?

11          A     I do.

12          Q     And the first bullet point, "They're specifically  
13 designed to extract value from advertisers."

14                    Do you agree with that statement?

15          A     It's potentially fair.

16                    I mean, I guess what's going through my mind is if  
17 the absence of there being a pricing mechanism would mean  
18 that all advertising on Google should be free and so  
19 therefore any price naturally means that advertisers paying  
20 for the ads means that Google's generating some revenue from  
21 the ads and therefore has value extraction, it seems like a  
22 fair statement.

23          Q     And Google does not give away ads for free on  
24 Google, correct?

25          A     That is correct, we charge for ads.

1 Q It charges for them.

2 And to the amount, I think we said a hundred  
3 billion dollars last year, correct?

4 A Something like that, in ballpark, in aggregate.  
5 There's many clicks that go into that, rather than one.

6 Q In the same document, if we can turn to page 792,  
7 we're going to talk about holistic pricing, which I think  
8 Your Honor asked a question about or at least there was --  
9 in response to your question, there was an answer about  
10 holistic pricing.

11 Do you see it "Handling contributions over time:  
12 holistic pricing effort"?

13 A I do see that slide.

14 Q And going to the first bullet, it says, "Teams  
15 across ads quality create value and move prices around."

16 Do you see that first bullet?

17 A I do.

18 Q And the second bullet states, "It's lower risk  
19 when we move prices along with value."

20 Do you see that statement?

21 A I do.

22 Q And you're familiar with the term "holistic  
23 pricing," correct?

24 A Somewhat. It's a dated concept, but I have  
25 somewhat of a recollection of it still.

1 Q And you defined -- you define holistic pricing as  
2 an -- let me re-start.

3 You define holistic pricing as an effort to  
4 identify areas where the price was unusually low relative to  
5 where Google believed prices should be?

6 A I have no recollection of making that statement.

7 Q Okay.

8 Let's -- if I can refresh your recollection.

9 Look at your deposition, please. October 15th,  
10 2021.

11 And we're not going to read it. I'm just going to  
12 have you read it to yourself.

13 October 15th, 2021, page 401.

14 A I am on that page.

15 Q 401, line 19 through 402, line 1. Just read that  
16 Q&A for a moment. And if you need to look above or below,  
17 feel free as well, and then I'll re-ask my question.

18 A So to confirm, you said page 401 --

19 Q Certainly. October 15th, page 401, line 19,  
20 through 402/1.

21 A Okay.

22 Q Oh, I'm sorry, it's October 15. Did I misdirect  
23 you?

24 A I believe I'm reading what you intended for me to  
25 read.

1           Okay. I've read this.

2           Q     Okay.

3           You can close it, and let me re-ask the question.

4           A     Do you mind if I have it open while you ask the  
5 question?

6           Q     Sure.

7           A     Thank you.

8           Q     Sir, let me ask the question.

9           Would you agree, you defined holistic pricing as  
10 an effort to identify areas that are unusually low relative  
11 to where Google believed prices should be?

12          A     It appears that's what I said back then.

13          Q     And returning back to the document we're looking  
14 at, UPX889, Google believes that it's lower risk if it  
15 increases prices at the same time that it increases value,  
16 correct?

17          A     So I don't consider that a fair characterization  
18 of what the slide says.

19          Q     Okay.

20                 The holistic pricing project at Google in general  
21 raised prices for search ads.

22                 Would you agree with that?

23          A     Not necessarily.

24          Q     Let me ask a more specific question.

25                 Would you agree that an aggregate sum, the

1 summation of the CPCs under the holistic pricing were  
2 positive in value?

3 A Not necessarily depending on where one draws the  
4 boundaries of the effort.

5 Q Okay.

6 Now, if I could turn you back to your deposition,  
7 October 15th, 2021, and this one we will read together.

8 Page 412 and 413.

9 So October 15, page 412. Let me know when you're  
10 there.

11 A I believe I am there.

12 Q Great.

13 Sir, on October 15th, 2021, were you deposed, at  
14 line -- page 412, line 24, through 413, line 5, were you  
15 asked this question and did you give this answer?

16 "Overall, did the holistic pricing project raise  
17 CPCs?

18 "Answer: So, again, there's the verbiage of  
19 raise, which I take issue, but I can imagine that if one  
20 were to sum the aggregate change in aggregate CPCs, it is  
21 possible that in summation the value is positive."

22 Did you make that statement?

23 A It appears that I did.

24 Q Thank you, sir.

25 Okay. Moving forward. I think we're done with

1 that document.

2 Let's take a look at UPX467, which should be in  
3 your binder.

4 And UPX467 is a document that you wrote, your name  
5 is right at the top, "Juda at."

6 Do you agree?

7 A I agree.

8 Q Sounds like you're familiar with this document,  
9 you remember it at least?

10 A Yes, I do remember it.

11 Q The title is "Why leaning on ads quality to  
12 deliver plus 20 percent long term Rasta RPM for all of  
13 search ads is a fragile strategy (TL;DR: It's likely not  
14 possible)."

15 Let's ask about that title, let's define a few  
16 words.

17 AQ is ads quality, correct?

18 A Yes.

19 Q 20 percent is a 20 percent goal that was imposed  
20 on the ads quality team -- or a goal to increase revenue by  
21 20 percent, correct, that was the goal?

22 A Incorrect.

23 Q What was the 20 percent goal?

24 A It's in reference to the words that come after  
25 that, the long-term Rasta RPM.

1 Q And Rasta is the platform that Google uses to run  
2 experiments in, correct?

3 A Correct.

4 Q And RPM is revenue per thousand, correct?

5 A Correct.

6 Q And this is something I've always -- RPM stands  
7 for revenue per mille, which is French for thousand,  
8 correct?

9 A Correct.

10 Q And TL;DR there is "Too long; didn't read"?

11 A Correct.

12 Q That's a euphemism?

13 A It's an acronym to note that a summary is  
14 forthcoming.

15 Q So maybe we should go right to the summary in  
16 order to give us a little more definition.

17 Under the heading of summary, you say,  
18 "Historically the overwhelming majority of search ads  
19 20 percent revenue per thousand OKR," and OKR is a goal that  
20 is part of the Google company, correct?

21 Let me restate the question.

22 What's an OKR?

23 A It's an acronym that stands for objective and key  
24 results. It's a way that teams organize their goals over  
25 varying time periods, along with how they're going to try



1 and measure whether they've made progress against said  
2 objective.

3 Q So historically -- we'll start over.

4 "Historically the overwhelming majority of search  
5 ads 20 percent revenue per thousand OKR has rested on the  
6 shoulders of the search ads quality team. This document  
7 articulates why that strategy is structurally becoming more  
8 fragile over time and likely is not one on which to rely in  
9 2020."

10 Is that -- you wrote that. Is that a good summary  
11 of what the rest of the memo shows?

12 A It is.

13 Although, I'll note that I said 2020 plus, so it's  
14 a more forward-looking thing than just limited to the  
15 calendar year.

16 Q Appreciate that.

17 You were writing in this memo because you believe  
18 that the search ads team, all of the revenue goals have been  
19 imposed on your team, and you're saying, we can't meet them  
20 all the time anymore, we need help?

21 A I disagree with that characterization.

22 Q Okay.

23 "Issue 1, external structural headwinds."

24 And there's numbers here that are confidential, so  
25 I'm not going to read them and I'd ask you not to read them,

1 so I'm just going to gap over them as we're reviewing this.

2 The first sentence, "PLAs appear that they will  
3 likely be touching X of spend in 2019."

4 Do you see that statement?

5 A I do.

6 Q And so just to put us in time, you wrote this memo  
7 around 2019 because you're looking forward to 2020 and  
8 beyond, correct?

9 A That would be my inference, yes.

10 Q And yesterday we talked about PLAs are shopping  
11 ads?

12 A That is correct.

13 Q And before this, let's read the next sentence  
14 perhaps.

15 "So at most X of Google.com spend comes from  
16 search ads and perhaps much less if travel is included in  
17 query nav. I can't tell."

18 Do you see that statement?

19 A I do.

20 Q So without referencing -- in that statement,  
21 search ads, are you referencing text ads in that statement?

22 A I believe so.

23 Q Okay.

24 So you're giving numbers as to the numbers of  
25 revenue that comes from search ads and an amount of revenue

1 that comes from shopping ads, correct?

2 A Correct.

3 Q And without giving specific numbers, would you  
4 agree that the text ads represent the overwhelming majority  
5 of revenue in search ads?

6 A So the document notes that there was potentially  
7 some other formats that were included in that number, the  
8 sum of all or those though seems to be a large majority,  
9 yes.

10 Q Like travel, you can't tell if travel is in there  
11 or not?

12 A That's correct. The particular dashboard that  
13 I was using for sourcing these numbers wasn't clear to me  
14 regarding which formats were included or excluded.

15 Q And your best estimate, how much would travel ads  
16 represent of that total search ads number; small amount most  
17 likely, correct?

18 A Probably relatively modest in percentage terms.

19 Q The next sentence states, "Therefore," I'll remove  
20 the formula, "more is being asked of ads quality relative to  
21 a long time ago if they alone need to get to 20 percent."

22 Do you see that statement?

23 A I do.

24 Q And there you're saying if the ads quality team  
25 alone has to get to 20 percent, we might not be able to make

1 it anymore; agree?

2 A That was my concern.

3 Q Okay.

4 Let's go down to issue 2, internal structural  
5 headwinds.

6 The first statement, "Relative to the past when  
7 the OKR was still 20 percent, we're now dramatically more  
8 conservative in how we translate Rasta RPM to bookable RPM."

9 Do you see that statement?

10 A I do.

11 Q And we talked about it a minute ago, Rasta is the  
12 experiment platform that you use to run various ad launches  
13 or ad tuning experiments, correct?

14 A That is correct.

15 Q And you run them there before you launch them onto  
16 the full ad network through Google.com, correct?

17 A That's a general best practice, yes.

18 Q And if your goal in the Rasta is to hit 20 percent  
19 when you actually launch it for real, you may or may not hit  
20 that exact 20 percent, right; it may be above, it may be  
21 below?

22 A Can you ask the question again?

23 Q Certainly.

24 The 20 percent OKR goal, which we agree that was  
25 the goal for ads quality group, right, was to hit

1 20 percent?

2 A From a long-term Rasta RPM perspective, yes.

3 Q When you run an experiment in Rasta, when you  
4 actually launch it out into the Google.com, it may be higher  
5 or lower than what the experiment ran?

6 A When you say "it," to what are you referring to?

7 Q The launch or the tuning.

8 A So can you please reframe the question?

9 Q Certainly.

10 A Thank you.

11 Q I'm looking at the last part of this sentence.

12 "More conservative in how we translate Rasta RPM to bookable  
13 RPM."

14 The percentage of revenue increase that you  
15 estimate in the Rasta experimental platform may or may not  
16 be total bookable RPM. Agree?

17 A Agreed.

18 But we may have different definitions of bookable  
19 in our mind when answering and asking that question.

20 Q Okay.

21 I'm focused on your memo and the definition that  
22 you had in mind when you wrote that sentence.

23 A Okay.

24 Then, yes, the progress that we may record against  
25 our OKR objective is likely to be a smaller number than what

1 Rasta is indicating as the RPM.

2 Q And, Dr. Juda, would you agree that the search ads  
3 quality team historically contributed the overwhelming  
4 majority of search ads' 20 percent revenue goals at Google?

5 A No, because you're referencing a revenue goal and  
6 long-term Rasta RPM is a distinct concept from revenue.

7 Q Let's define, how do you define long-term Rasta  
8 RPM?

9 A So long-term Rasta RPM, going back to this concept  
10 of a steady state, is trying to approximate what would the  
11 hypothetical change be in RPM over a period of time, subject  
12 to holding the rest of the world equal, which is an  
13 unusually strong assumption.

14 But sort of at a high level, it takes the  
15 immediate term estimate of the revenue impact of a launch,  
16 it then tries to bake in an estimate of how users are going  
17 to respond to the launch over time, because if you have --  
18 so if we go back to the previous example where someone  
19 clicks on a low quality ad and they stop clicking in the  
20 future, that would be something that, in the Rasta  
21 experiment, would show high revenue.

22 But if we start to estimate the user response, we  
23 would then be estimating much less revenue over time because  
24 we would want to factor in the fact that users are clicking  
25 on our ads less. So it's short of like the short-term

1 revenue estimate.

2           We try and account for the long-term user  
3 response. We try to then factor in the long-term advertiser  
4 response to the launch. We then try and factor in the  
5 long-term system response to the launch. And then that  
6 tries to give us a more holistic perspective on what this  
7 launch is going to do over time. And that would be the  
8 long-term Rasta RPM.

9           At times, it can be almost disjoint from how much  
10 revenue the company actually makes in practice from a search  
11 ad system.

12           Q     Let's turn to the next page of your memo, your  
13 2019 memo.

14           THE COURT: So just -- I'm sorry to interrupt you.

15           So the Rasta RPM is a, in layman's term, an  
16 estimate, a long-term estimate?

17           THE WITNESS: So the one in Rasta is actually a  
18 short-term estimate.

19           THE COURT: Short term.

20           THE WITNESS: So one can sort of think -- the way  
21 we run experiments can sometimes be thought of as every  
22 single time a user issues a search, we'll flip a coin, and  
23 if it lands in tails, it'll be like our normal production  
24 setup. And if it lands on heads, we'll apply the  
25 experimental treatment to the experiment.

1           THE COURT: That is what the intended launch will  
2 be?

3           THE WITNESS: Correct. It's the change to our  
4 status quo that we want to try and collect data on.

5           THE COURT: Right.

6           THE WITNESS: You can then ask yourself over the  
7 life of the experiment what was the total revenue divided by  
8 total searches when landing on tails.

9           And you can ask yourself what the total revenue  
10 was divided by total searches for when the coin landed on  
11 heads. And that would sort of then give you an RPM estimate  
12 for the control group and an RPM estimate for the treatment  
13 group.

14           And then our user interface will automatically  
15 compare those two numbers to each other and tell you what --  
16 a change.

17           So it would sort of tell you that while the  
18 experiment was running, the treatment group was experiencing  
19 1 percent higher revenue per search on average than the  
20 control.

21           But all these things are very much an "in  
22 real-time estimate," and so it doesn't have the luxury of  
23 yet knowing how are users going to respond over time, how  
24 are advertisers going to respond over time, because there  
25 hasn't necessarily been enough time that has passed.



1           In addition, most of our experiments are running  
2 at relatively low levels of traffic. You can imagine  
3 1 percent of traffic, half a percent of traffic. So it's  
4 not necessarily yet at the magnitude where a user would  
5 surely see enough of the experience or that the advertiser  
6 would see enough of the experience to yet bake their  
7 response into the new normal if we were to actually launch.

8           And so that's what creates the discrepancy between  
9 the immediate term estimate and our long-term beliefs for  
10 where we think things will settle.

11           THE COURT: And so 20 percent long-term Rasta RPM  
12 means a 20 percent target positive delta between the  
13 launched -- the new -- the postlaunch ad -- postlaunch ad  
14 from the baseline prelaunch ad, is that --

15           THE WITNESS: That's correct.

16           THE COURT: Okay.

17           THE WITNESS: Where I think what's happened over  
18 the years is we've become ever more adept at measuring some  
19 of these longer term responses. So, you know, I mean,  
20 I guess, as mentioned in this paragraph --

21           Oh, please.

22           THE COURT: Sorry.

23           So is the idea here that there is a 20 percent --  
24 there's a goal that changes to the equation or a launch will  
25 result in a 20 percent rise in revenue?

1 THE WITNESS: It's less on a per launch basis and  
2 so more -- there's launches continuously happening  
3 throughout the year. When you -- the way you measure some  
4 as being positive .1, negative .2, positive .3. And so we  
5 try and take the sum --

6 THE COURT: I see.

7 THE WITNESS: -- overall of the launches and the  
8 idea is that ideally over the course of the entire year, the  
9 sum of all those individual values will be 20 percent.

10 THE COURT: Got you. All right.

11 So it's not a per launch. This is a --

12 THE WITNESS: Correct.

13 THE COURT: -- recognition that some launches may  
14 actually result in lower revenue; but over the long run, the  
15 collection of some number of launches, whether it's annually  
16 or semiannually, whatever the case may be, should be a  
17 positive 20 percent.

18 THE WITNESS: That's right, where the positive 20  
19 was an annual objective that we would try to get to over the  
20 course of an entire year.

21 THE COURT: Okay. Thank you.

22 THE WITNESS: You're welcome.

23 MR. DAHLQUIST: Thank you, Your Honor.

24 BY MR. DAHLQUIST:

25 Q And in following up with the Court's questions,

1 historically, your group has hit or exceeded the 20 percent  
2 OKR, correct? That's the start of your memo?

3 A That's my recollection.

4 Q And now in 2019, you were expressing some concern,  
5 "we might not be able to hit our aggregate 20 percent goal"?

6 A That is right.

7 THE COURT: Can I ask you another question?

8 THE WITNESS: Yeah.

9 THE COURT: Who's this -- who's the audience for  
10 this?

11 THE WITNESS: Sure.

12 So the original --

13 THE COURT: It's not a federal judge, let me  
14 assure you of that.

15 THE WITNESS: Yeah, no.

16 So the original audience was my manager, where my  
17 rough intention was, "Dear manager, other teams are starting  
18 to work on ads products, and if the overall aggregate goal  
19 is solely lying on the shoulders of a team that's touching  
20 ever less of the revenue, you're effectively asking my team  
21 to work ever harder. It would sure be nice if everyone put  
22 forth an effort to innovate versus just my team with respect  
23 to this goal because that's probably a more stable and  
24 enduring solution and less likely to lead to burn out."

25 So it was kind of a call to arms to my manager to

1 help other people chip in to the cause.

2 THE COURT: Okay. Thank you.

3 THE WITNESS: You're welcome.

4 BY MR. DAHLQUIST:

5 Q Looking at the same document, UPX467, on the  
6 second page, there's a header and there's a number of bullet  
7 points. Do you see that?

8 And this the Bates stamp ending 332.

9 A I do.

10 Q Calling your attention to the top, you wrote, "Is  
11 search ads more broken than ever in creating RPM?"

12 And you answer your own question by saying, "If  
13 anything, I'd argue the opposite."

14 Do you see that?

15 A I do.

16 Q And let's look through each bullet point.  
17 Targeting.

18 What is targeting?

19 A So here I think it was in reference to the general  
20 set of processes that match advertiser keywords to user  
21 searches.

22 Q You state, "Probably an area which still has a lot  
23 of headroom, but capturing that headroom has proven very  
24 challenging."

25 Do you see that statement?

1           A     I do.

2           Q     And we haven't defined this term yet.  Headroom,  
3 would you agree, is the difference between what an  
4 advertiser has bid on and the difference between the next  
5 runner-up bid?

6           A     Not in this context, no.

7           Q     Okay.

8                     How would you define "headroom"?

9           A     So in this particular context, what I would have  
10 had in mind is there is a set of searches that people are  
11 issuing on google.com that would be relevant to an  
12 advertiser and the good or service that they're advertising.

13                     And then there is a smaller set of searches that  
14 an advertiser is likely matching in practice.

15                     And so headroom here would be all of the searches  
16 that people are issuing that would be good for an advertiser  
17 to be matching against but in practice aren't for whatever  
18 reason.

19           Q     So in your definition of headroom, it's that you  
20 could have advertisers' ads appear in response to more  
21 queries, simply put?

22           A     I think that's a fair characterization.

23           Q     The next bullet, Prediction Stack.

24                     You state, "If anything, we may be generating too  
25 much revenue versus too little."

1 Do you see that statement?

2 A I do.

3 Q And what's a "prediction stack"?

4 A So these would be the collection of our systems  
5 that try and predict quality, the PCTR, PLQ, and PCQ that  
6 I've referenced in the past.

7 Q And going to your last full sentence, "Within  
8 ClickQuality, I think that the general belief is that we're  
9 likely showing more low quality ads that we ought to not be  
10 showing relative to high quality ads that are not making  
11 their way through the auction."

12 Did you make that statement?

13 A I believe that I did or it looks like I did.

14 Q The next bullet, Auction/Pricing.

15 THE COURT: I'm sorry. What is -- can you explain  
16 what "ClickQuality" is? Is that a different group?

17 THE WITNESS: Sure.

18 THE COURT: If so, what do they do?

19 THE WITNESS: Yeah. So it's an overloaded term.

20 So here I was probably referencing a team whose  
21 name is the click quality team. That ClickQuality team are  
22 the sort of like engineers/stewards of our landing page  
23 prediction and creative quality prediction models.

24 THE COURT: I see.

25 Just also to be clear, these bullets points are --

1 if I understand correctly, these are other areas where you  
2 are suggesting improvements can be made to hit the  
3 20 percent -- the 20 percent number?

4 THE WITNESS: Yeah.

5 So I guess probably back when I was authoring this  
6 paper, this was sort of my mental model for how the ads  
7 quality team is organized. There's teams that are doing  
8 like keyword search matching. There's teams that are  
9 working on predicting quality. There's teams that are  
10 working on the auction. There's teams that are working on  
11 the look and feel of the ads. And I was trying to provide  
12 commentary on what kinds of opportunities might there be  
13 within each team to innovate and how might those innovations  
14 contribute either positively or negatively to the LT RPM  
15 estimate.

16 So in the case of this prediction stack, final  
17 sentence that we just read, you know, I think this was me  
18 theorizing at the time that probably there was more  
19 opportunity for us to identify lower quality ads that we are  
20 showing that we should probably stop showing, relative to  
21 high quality ads that we aren't showing but should.

22 And so, therefore, if as we improve quality, we'll  
23 be taking away more ads than we're identifying to show, my  
24 expectation would then be that you'd have a negative net  
25 impact to revenue, and so therefore it would be a drag

1 against an LT RPM OKR.

2 THE COURT: Okay.

3 BY MR. DAHLQUIST:

4 Q To the next bullet point, Auction/Pricing, you  
5 state, "The general belief here is that there's more juice  
6 in getting prices right (higher) than in improving the  
7 allocation of ads."

8 Did you make that statement?

9 A It appears that I did.

10 Q The next bullet point, Ads UI.

11 And Ads UI is user interface, correct?

12 A I'm sorry, what was that?

13 Q Sir, the UI is user interface, correct?

14 A Correct.

15 Q And the bullet under Ads UI, you stated, "The  
16 fraction of clicks going to ads on pages with ads climbing  
17 ever higher and there is seemingly a real risk that we might  
18 be approaching some asymptote for what is possible here. If  
19 anything, 100 percent of clicks going to ads is a clear  
20 ceiling."

21 Did you make that statement?

22 A It appears so.

23 Q And let me make sure I understand that.

24 You were saying that the number of users that are  
25 clicking on ads is climbing higher and higher every day,



1 agree?

2 A No, I don't believe that's what I'm saying.

3 Q You're stating that there is an asymptote which  
4 would be 100 percent of clicks going to ads in response to a  
5 user query?

6 A That I think I'm saying as a, you know, the laws  
7 of physics would only permit all of the clicks to go to ads  
8 as a limit.

9 Q You can't get more than 100 percent of clicks  
10 going to ads, right?

11 A That is correct.

12 Q But you say you're reaching some asymptote, a  
13 ceiling, that could reach to 100 percent, correct?

14 A I'm not sure that's what I'm saying here.

15 I'm saying that we might be approaching an  
16 asymptote. I'm not declaring necessarily what that  
17 asymptote is that we're approaching. I only note that  
18 obviously the numbers is never going to go above 100  
19 percent.

20 Q Thank you.

21 THE COURT: In other words, there is some ceiling  
22 that's less than 100? I mean --

23 THE WITNESS: That would be -- my expectation is  
24 that it is unlikely to think we'll reach a point where users  
25 are exclusively clicking on ads -- on searches that are

1 showing ads.

2 THE COURT: Right.

3 THE WITNESS: But I'm not sure what that number  
4 may be in practice, just that there must be some upper bound  
5 to it.

6 THE COURT: Okay.

7 BY MR. DAHLQUIST:

8 Q And, Dr. Juda, in this memo, UPX467, you reference  
9 some of the external structural headwinds and internal  
10 structural headwinds that you were facing that might not  
11 allow you and your group to reach your 20 percent OKR.

12 Would we agree with that generalization?

13 A That sounds right.

14 Q Nowhere in this memo at UPX467 do you have any  
15 mention of competitors, correct?

16 A As in other search engines?

17 Q Correct.

18 A Or in other advertising platforms or?

19 Q Nowhere in UPX467 do you mention other competitors  
20 as a reason why you may not hit your 20 percent OKR revenue  
21 goals, correct?

22 A I'd have to read the document in full, but  
23 certainly the parts that we've referenced to date, I haven't  
24 seen such reference.

25 Q It's a two-page memo; please take a minute to read

1 it.

2 And my question is, nowhere in your memo do you  
3 mention competitors as a reason why you will not hit your  
4 20 percent revenue goals?

5 A So there's some implicit references here to  
6 competitors and competition, but I agree it's not explicitly  
7 called out.

8 Q We're done with that document.

9 Let's go to UPX465.

10 THE COURT: I'm sorry, we're a little bit shy of  
11 11:00, so why don't we go ahead and take a break before you  
12 move to another document.

13 So why don't we -- we'll take about 15 minutes and  
14 we'll resume a little bit after ten after 11:00. Thank you,  
15 all, very much.

16 MR. DAHLQUIST: Thank you, Your Honor.

17 COURTROOM DEPUTY: All rise. This Court stands in  
18 recess.

19 (Recess from 10:55 a.m. to 11:13 a.m.)

20 COURTROOM DEPUTY: All rise. This Honorable Court  
21 is again in session. Be seated and come to order.

22 THE COURT: Please be seated, everyone.

23 Mr. Dahlquist, can I just ask where you see  
24 yourself in your examination?

25 MR. DAHLQUIST: That's a great question. I've

1     been asking myself that question.

2             I conservatively have 45 minutes.  Hopefully I can  
3     get it done in that.  So I certainly anticipate finishing  
4     before lunch, I guess, is the goal.

5             THE COURT:  Okay.

6             MR. DAHLQUIST:  But I do have a little bit more  
7     material, Your Honor.

8             THE COURT:  Why don't you proceed.  Thank you.

9             MR. DAHLQUIST:  Thank you, Your Honor.

10     BY MR. DAHLQUIST:

11             Q     Dr. Juda, welcome back.  If we could please turn  
12     to UPX465.

13             The title is "Pitch on Adam Juda delivering next  
14     level performance."  And let me know when you're there.

15             A     I am there.

16             Q     Okay.

17             UPX465 was a memo you wrote to your supervisor  
18     looking for a promotion, would you agree with that very  
19     general characterization?

20             A     That sounds right.

21             Probably more so like informing him on how to  
22     advocate on my behalf.

23             Q     And at this time in February of 2020, who did you  
24     report to; was it Mr. Tischler?

25             A     No, I believe at this point it was Darshan Kantak.

1 Q And who does Darshan Kantak report to?

2 A At the time, it may have been Shiv, Shivakumar  
3 Venkataraman.

4 Q Okay.

5 And let me ask. Did you receive the promotion  
6 that you advocated for yourself?

7 A Eventually, yes. That spring promotion cycle was  
8 canceled on account of COVID complexities.

9 Q Looking at UPX465, I'd like to ask you some  
10 questions about it.

11 You say at the top, "You are the PM project  
12 manager lead for the core ads quality, both search and  
13 shopping."

14 Do you see that statement?

15 A I do.

16 Q And there you're referencing search, are you  
17 meaning text ads?

18 A I am.

19 Q As well as search ads syndication. What is search  
20 ad syndication?

21 A So one of the services that we provide as an ads  
22 organization is third-party search engines can outsource to  
23 us the display of ads on their website in response to intent  
24 or queries.

25 Q You hope to send search ads out to other search

1 engines who would contract with Google for the service,  
2 correct?

3 A Not only search engines, but yes.

4 Q You state, "We manage and optimize the serving,  
5 quality and pricing of the," and there's an X number in  
6 there, "business that is search ads."

7 Do you see that?

8 A I do.

9 Q And I believe we talked about earlier, or I stated  
10 that you recall the search ads business being over  
11 \$100 billion a year business, correct?

12 A I recall saying that.

13 Q The next statement that you made is "Over the past  
14 five years, we have launched X percent of revenue innovation  
15 per year on average, while additionally enabling a few  
16 points of growth each year via companion pricing and tuning  
17 launches of our sibling Ads UI team's work."

18 Do you see that?

19 A I do.

20 Q And earlier with the Court, we had a discussion of  
21 you had a 20 percent OKR, or objective or key result,  
22 correct?

23 A Correct.

24 Q And is this number here, which is redacted so  
25 we're not going to read it, but would you agree that number

1 is the actual translation of revenue goal that came from  
2 your 20 percent OKR?

3 A No.

4 As alluded to by me using the word "innovation"  
5 and not just revenue as a standalone term.

6 Q Would you agree that over -- as you stated in this  
7 memo in February of 2020 that over the past five years, you  
8 launched X percent of revenue innovation per year on  
9 average, agree?

10 A Agree.

11 THE COURT: I'm sorry, how would you distinguish  
12 revenue from revenue innovation?

13 THE WITNESS: Yeah.

14 So to me, the number here would be in like the  
15 same units as that plus 20 percent long-term Rasta RPM  
16 objective.

17 That number can be somewhat orthogonal from how  
18 much additional revenue the company actually makes in  
19 practice, so this isn't intended to necessarily mean me  
20 making a statement like the such ads revenue that we report  
21 to Wall Street was surely 9 percent higher than it otherwise  
22 would have been, but it's rather just saying, with respect  
23 to that 20 percent goal, you know, the number of percentage  
24 share goes against that 20 point objective.

25 THE COURT: So this percentage is a measure, if

1 one were to look at this number, it's to be measured against  
2 the 20?

3 THE WITNESS: The 20 percent, not against the  
4 amount of revenue that the company actually made.

5 THE COURT: Got you. Okay.

6 BY MR. DAHLQUIST:

7 Q And you agree that you -- I think we said earlier,  
8 your work in the search ads team, you believe you've helped  
9 to increase revenue at Google over the time?

10 A Directionally, yes.

11 Q At the bottom of the next paragraph states, you  
12 describe yourself as one of the most prolific reviewers of  
13 ads quality launches in history.

14 Would you agree with that statement?

15 A I certainly did at the time. It's now been three  
16 years of people who've also been posting, so I'm not sure  
17 what the comparison would be these days.

18 Q So you also state that you spend an incredible  
19 amount of time with tons of lawyers ensuring people  
20 throughout the planet appreciate that we operate a clean and  
21 law abiding product.

22 Do you see that statement?

23 A I do.

24 Q What is the reference that you spend a ton of time  
25 with lawyers mean?



1 MS. WASZMER: Objection, privilege.

2 MR. DAHLQUIST: Sorry, I'm not -- let me withdraw  
3 the question. I'll move on.

4 BY MR. DAHLQUIST:

5 Q Let's go to the next page.

6 Or, I'm sorry, staying on here, the next heading  
7 is "Some major accomplishments" -- "some historical major  
8 accomplishments," to be specific.

9 Do you see that heading?

10 A I do.

11 Q The last sentence in this first paragraph here  
12 states, "I was the project manager of the LTV project,  
13 whereby we explicitly incorporated other quality signals  
14 into the ranking function and which has subsequently spawned  
15 several billions dollars per year of further improvements."

16 Do you agree with that statement?

17 A So it's probably a bit incomplete because I would  
18 still say it's referring to the Rasta RPM goal rather than  
19 explicit Google revenue; otherwise, I still buy that.

20 Q Sir, on UPX465, which is a memo you drafted on  
21 February 2020, correct?

22 A It appears so.

23 Q And you state that you're the project man of the  
24 LTV project right there, correct?

25 A Yes.

1 Q Would you agree that the LTV project subsequently  
2 spawned several billions dollars per year of further  
3 improvements? Yes or no?

4 A As measured in RPM OKR terms or as measured as  
5 realized revenue reported to main street by the company?

6 Q I'm using your words.

7 Do you agree that in February of 2020, when you  
8 wrote this memo, you stated that "As the project manager of  
9 the LTV project, you helped to spawn several billion dollars  
10 per year of further improvements"; yes or no?

11 A So I agree that's what this document says.

12 Q Thank you.

13 If we go down.

14 And they're incorporating the impact of formats  
15 into the auction.

16 Do you see that heading?

17 A I do.

18 Q And, again, these numbers are redacted.

19 Let me try to expedite this.

20 Let's go down to the last line of that. You're  
21 talking about an ads formats. An ad format was a launch  
22 that was made to the ad auction process, correct?

23 A Can you repeat the question?

24 Q Certainly.

25 Google and your group, the ads quality group, made

1 a number of launches that impacted the ads format to the  
2 search ads auction process, correct?

3 A I'd probably describe it more as incorporating  
4 formats into the auction, rather than necessarily impacting  
5 the formats themselves.

6 Q And the last sentence of this document, UPX465, in  
7 this paragraph states, "Since that launch, several billion  
8 dollars per year of additional revenue has been generated by  
9 pairing Ads UI launches with pricing adjustments (where to  
10 my team's credit, the pricing mechanisms have improved since  
11 the original launch)."

12 Did you make that statement?

13 A It appears that I did.

14 Q The next paragraph has a heading of "FTC versus  
15 1-800 contacts."

16 Do you see that heading?

17 A I do.

18 Q Towards the bottom, you state that you're also "a  
19 contributor to Google's original defense to the DOJ on  
20 antitrust concerns Project Eagle."

21 Do you see that statement?

22 A I do.

23 Q Sir, what is Project Eagle?

24 A So that was the internal reference to -- and it  
25 was probably the FTC rather than DOJ -- investigation into

1 Google many years ago.

2 MS. WASZMER: And, counsel, here I'm just going to  
3 object to further questions if they would elicit privileged  
4 information.

5 MR. DAHLQUIST: I am moving on.

6 BY MR. DAHLQUIST:

7 Q To next page, please, sir, Bates stamp ends 455.  
8 Up at the top, the first full paragraph has the header,  
9 "Keeper of many skeletons within ads."

10 Do you see that heading?

11 A I do.

12 Q What do you mean by "you're the keeper of many  
13 skeletons within ads"?

14 A So there's many aspects of the ads system that are  
15 relatively thankless and grungy tasks, but it's important  
16 that someone pay attention to them and continue to be their  
17 steward. And I was the steward of such thankless tasks.

18 Q And I think the next topic, we're going to ask you  
19 about one of those.

20 Are you familiar with a proposal at Google called  
21 "Incognito"?

22 A I'm not sure of the name of the proposal was  
23 "Incognito." I certainly am familiar what, like, an  
24 incognito mode is.

25 Q Okay.

1           Let's go down to the next -- another paragraph on  
2 this same document.

3           Actually, it's on next page, top of the next page  
4 that ends 456.

5           The first full paragraph with the heading  
6 "Incognito."

7           You state that you've been "collaborating with the  
8 search team on their incognito ambitions."

9           Do you see that statement?

10          A     I do.

11          Q     And was Incognito a proposal at Google to have  
12 more privacy at Google?

13          A     That's not my recollection of what the effort was.

14          Q     We'll get to a document that'll provide some more  
15 specificity.

16                 But while we're on this one, you helped define  
17 that "the privacy initiative at Google would potentially  
18 cost Google billions per year in revenue."

19                 Do you see that statement?

20          A     I do see that statement.

21          Q     And you credit, in this memo where you're seeking  
22 a promotion, your efforts from -- efforts that would have  
23 cost Google billions to which "ultimate user needs and  
24 impact Google Search ads by revenue only" -- and it's  
25 X number right there.

1 Do you see that statement?

2 A I do.

3 Q You helped to work with the team on Incognito to  
4 scale it back in order to make it less of a lower revenue  
5 impact on Google, correct?

6 A That's not how I would characterize my  
7 contribution.

8 Q In 2019, would you agree that Google considered an  
9 Incognito Proposal that would have applied across all Google  
10 properties at a server level?

11 A I'm not sure. I'd have to look at the  
12 documentation to know.

13 Q We can do just that.

14 If we can please -- I think we're done with this  
15 document. And go to UPX811, which should be in your binder.

16 And on this one, we're not going to focus on  
17 email, we're going to go right to the attachment which  
18 starts at 4407.

19 And, sir, do you agree that -- do you recognize  
20 this presentation as part of the Incognito project at Google  
21 at UPX811?

22 A I don't immediately recall it. It seems  
23 plausible.

24 Q And if we can turn to the next page, Bates stamp  
25 ending 4420, I think this one might be redacted so we'll be

1 cautious but I'd like to ask you some questions about it.

2 Well, here -- actually, let's do this first.

3 Let's start earlier at 4408, which is the first page after  
4 the title page.

5 And you see the heading is Product Proposal.

6 That's what we can share today. Do you see that heading?

7 A I do.

8 Q And under Product Proposal, there were a number of  
9 bullets there, and we won't read any of them specifically,  
10 but it was a proposal where Google would have collected  
11 significantly less data from users.

12 Would you agree with that?

13 A Not necessarily.

14 Q In the Incognito Proposal, Google would is  
15 implemented it on the server side of Google, not only  
16 limited to Chrome; isn't that correct?

17 A I'm not sure.

18 Q Google's Incognito Proposal was never implemented  
19 to the best of your knowledge; is that correct?

20 A I mean, so we have an incognito mode. I forget  
21 what, if any, changes to the incognito mode were made in  
22 response to this proposal.

23 Q And the incognito mode is a mode on Chrome,  
24 correct, that a user can select?

25 A Certainly, the Google Chrome incognito mode is.

1 I believe there's other web browsers that also have  
2 variations of that functionality. It may not be called  
3 incognito everywhere.

4 Q I'm focused on the Google product. There's an  
5 incognito mode on Chrome, correct?

6 A Correct.

7 Q The proposal -- the privacy proposal in front of  
8 you is more, in addition to what is available on Google  
9 Chrome in the incognito mode, agree?

10 A I'd probably characterize maybe more different  
11 than in addition.

12 Q So it's more different than what is currently  
13 available in Chrome incognito mode, agree?

14 A Agreed.

15 Q And as part of this proposal, let's go to the  
16 original page I was sending you to, 4420.

17 So we're at UPX811, Bates stamp 4420. And, again,  
18 this is confidential and redacted so we're not going to call  
19 any specifics.

20 But there, Google compares itself to another  
21 search engine. Do you agree with that?

22 A I'm not sure if this is a search engine or a  
23 browser comparison.

24 MR. DAHLQUIST: And, Your Honor, can I say the  
25 name?



1           Your Honor, I would request permission to identify  
2 the other entity that is on this page.

3           Google, I don't know if they have an objection to  
4 that?

5           MS. WASZMER: I think you can ask him the question  
6 of the name. I just don't -- the content below it is  
7 redacted.

8           MR. DAHLQUIST: I won't go into the content,  
9 Your Honor.

10          THE COURT: Okay.

11 BY MR. DAHLQUIST:

12          Q     Sir, on UPX811 is Google comparing itself to  
13 DuckDuckGo?

14          A     That appears to be the case.

15          Q     And Google is comparing the privacy proposal at  
16 Google, which is proposed in a UPX811, against what  
17 DuckDuckGo, at least, was as of that day. Do you agree with  
18 that?

19          A     That's my read of the slide.

20          Q     And there's -- without going into specifics,  
21 there's five boxes and DuckDuckGo is checked on all the  
22 boxes, agreed?

23          MS. WASZMER: Counsel, objection. You're going  
24 into confidential material now.

25          MR. DAHLQUIST: Okay. Let me try to restate the

1 question.

2 Your Honor, I guess I'd like a ruling on the  
3 confidentiality of this document and how far I can go.

4 On behalf of the United States, we don't believe  
5 this document, certainly not the checkboxes, should be  
6 confidential.

7 THE COURT: So, I'm sorry, can we be more  
8 specific? When you say "document," it's a very long  
9 document.

10 MR. DAHLQUIST: Certainly.

11 Understood, Your Honor.

12 I'll reference a specific page, UPX811, Bates  
13 stamp 4420.

14 We understand there's a number of product  
15 proposals which were never implemented, and I don't need to  
16 disclose those.

17 THE COURT: So you want to just refer to the box?

18 MR. DAHLQUIST: I want to refer to the boxes,  
19 correct, Your Honor.

20 MS. WASZMER: Your Honor, the reason this was  
21 redacted is it describes Google's proposed product design as  
22 compared with other companies, which is highly confidential  
23 and sensitive.

24 It is at the core of product design that the  
25 company considered.

1 THE COURT: Right.

2 But these are fairly basic -- the box -- these  
3 titles that are in the first line -- you know, the first  
4 column don't seem to me to be the kind of thing that is sort  
5 of a trade secret of Google's. I mean, these are fairly  
6 high level --

7 MS. WASZMER: Your Honor, this was a product  
8 design that has not been disclosed outside of the company  
9 that was considered.

10 THE COURT: No, I understand that.

11 But this is just a comparison of the two products  
12 at the time. If you want to not -- if the last column is a  
13 concern, then I'm not sure what the first three columns, why  
14 that's an issue.

15 MS. WASZMER: Your Honor, the first three columns  
16 include information about Google's proposal. You see,  
17 Google is one of the columns. And there's features on the  
18 left-hand side. There's checkboxes that reflect the  
19 company's discussion of what it was considering.

20 THE COURT: I'm maybe not reading this.

21 You've got features in column 1, DuckDuckGo;  
22 whether it has those features or not in 2; whether  
23 presumably Google at this point in time, when the document  
24 is written, has those features or not. And then column 4 is  
25 what Google would look like with the -- if the proposal were

1 implemented.

2 MS. WASZMER: Correct, Your Honor. That's the  
3 part that I'm talking about is the proposal.

4 THE COURT: Right.

5 And I'm saying, I don't think he's getting into  
6 the proposal.

7 MS. WASZMER: If counsel would like to ask about  
8 what features another search engine has, there's no issue.

9 THE COURT: Well, look, I -- what do you propose  
10 to get into, Mr. Dahlquist?

11 MR. DAHLQUIST: I'm trying to establish  
12 Your Honor, that -- one, that Google compared itself to  
13 DuckDuckGo, so I think we've got that.

14 THE COURT: Right.

15 MR. DAHLQUIST: And, two, that Google was lacking  
16 in multiple of these features as of the time of this  
17 proposal, and Google ultimately decided to not implement a  
18 feature which would have matched many of those same  
19 elements.

20 MS. WASZMER: Your Honor, if he wants to ask the  
21 witness those questions, I have no issue. It's really he  
22 just doesn't need this slide to do it.

23 MR. DAHLQUIST: Well, I can certainly start as a  
24 minimum predicate that, Your Honor.

25 But I would -- I respectfully submit even the

1 titles in the box --

2 Sure.

3 THE COURT: Let's do this.

4 I think the box is fine; the chart is fine. It is  
5 not the kind of thing that it seems to me weighing the  
6 factors I have to -- I mean, if the point here is that  
7 Google contemplated a particular set of features, and in  
8 doing so, it was comparing itself against what we now know  
9 to be DuckDuckGo, and it made certain decisions about  
10 whether to implement those features or not, that at least,  
11 in this context, sort of goes to the core of the case.

12 We're not talking about the level of detail that's  
13 on the left side of the slide. So if just the box can be  
14 shown, then that is fine. I don't think that is -- that  
15 does not rise to the level of something that, in my view,  
16 needs to be sealed.

17 MR. DAHLQUIST: Thank you, Your Honor.

18 MS. WASZMER: We understand, Your Honor.

19 MR. DAHLQUIST: We don't have this slide prepared  
20 to display publicly.

21 BY MR. DAHLQUIST:

22 Q Sir, just focusing on, not on any of the detail  
23 under product proposal, the chart on the right-hand side,  
24 there's five boxes there, and that DuckDuckGo checks every  
25 one. Let's just run through a couple of them.

1           On the first one, DuckDuckGo doesn't save IP  
2 addresses, correct?

3           A     My arm's length understanding is that it's a  
4 little bit complicated due to DuckDuckGo's relationship with  
5 Bing and what kind of information goes back and forth  
6 between those two parties.

7           Q     Looking at UPX811, on page 4420, solely at the  
8 chart, in this presentation, stated that Google -- that  
9 DuckDuckGo doesn't save IP addresses, correct?

10          A     I agree that's what this slide reflects, though  
11 I'm not actually convinced that's factually accurate.

12          Q     And has a box that says for Google has an X, it  
13 says, "Eventually expires."

14                   Do you see that?

15          A     I do.

16          Q     And under this proposal, it would have been a  
17 check that Google would not have saved IP addresses,  
18 correct?

19          A     I guess all I can say is that the slide contains a  
20 check. It's relatively unexpressed regarding what the check  
21 implies.

22          Q     Okay.

23                   And we'll get to it in a minute. You did a whole  
24 analysis of the Incognito program, and that's the next  
25 document we're going to get to, but let's focus here on this

1 chart.

2 The next box says "Doesn't save user agent."

3 Do you see that?

4 There's a check next to DuckDuckGo that they don't  
5 save user agent. Agree?

6 A I agree there's a check there.

7 Q And Google has an X meaning that it does save user  
8 agent. Agree?

9 A I agree there's an X there.

10 Q And, sir, do you have an understanding -- do you  
11 agree that Google, as of this time, does save user agent  
12 data?

13 A I'm not sure what we're saving or not saving at  
14 the moment.

15 Q Okay.

16 And under this -- it says, "With this proposal --"  
17 it would have been a check.

18 THE COURT: Can I interrupt, please?

19 What does "user agent" mean?

20 THE WITNESS: So what comes to my mind for user  
21 agent is various metadata that a browser would be expressing  
22 to a server when issuing a search. So it might say  
23 something like Chrome Version 10 on a Windows 95 machine  
24 might be the user agent.

25 THE COURT: Okay. So it's technical information?

1           THE WITNESS: Technical information, usually about  
2 the state of the user's machine.

3           THE COURT: Okay. Thank you.

4 BY MR. DAHLQUIST:

5           Q     And under the Incognito Proposal, Google would not  
6 have retained that information, agree?

7           A     So the table just says a check. I'm not sure what  
8 was necessarily proposing regarding the information.

9           Q     The third column is "Doesn't save cookie ID." See  
10 that? It says DuckDuckGo doesn't save cookie ID, agree?

11          A     That's what the slide says.

12          Q     Under Google it has a red X again, that Google  
13 saving a cookie IDs eventually expires.

14                   Do you see that?

15          A     I do see that.

16          Q     And under the proposal would have been a check  
17 that Google wouldn't have saved cookie IDs?

18          A     I see the check.

19          Q     And then the next two boxes, DuckDuckGo and Google  
20 are aligned. There's two things that DuckDuckGo does that  
21 even under current but under a proposal, Google does do,  
22 agree?

23                   And I almost need new glasses to read it all.

24          A     Yeah, I mean, so I see some pseudonymous  
25 references, as well as some personalization controls that



1 are being referenced.

2 Q Sure.

3 A So I see sort of just a lot of checks on that  
4 side.

5 Q It's a check minus, correct, to be more specific?

6 A The graphic is a check minus.

7 Q Okay.

8 And under the proposal, the Incognito Proposal  
9 would have gone with to a clear check, correct?

10 A The check is a standalone, yes.

11 Q All right. Let's move to a document that you  
12 actually wrote and will have maybe a little more information  
13 on.

14 UPX9.

15 It's entitled, "Ads PA ramifications of  
16 Incognito++." It says, "Adam, 'drawer of short straw'  
17 Juda."

18 Is this a document you wrote?

19 A Yes.

20 Q And before when you were talking about keeper of  
21 skeletons is this perhaps one of the examples of things that  
22 you were a drawer of the short straw on?

23 A So it wasn't in that same section, but probably it  
24 shares some of the characteristics of things that were in  
25 that section.

1 Q And this is a proposal that you created, correct?

2 A I would have to look through the entire deck, but  
3 I suspect it's something to which I largely contributed.

4 Q And so as we talked about before, the Incognito  
5 Proposal would have blinded the IP addresses from users,  
6 similar to DuckDuckGo, correct?

7 A So, again, I think the comparison at DuckDuckGo  
8 here is challenging given their partnership with the third  
9 party.

10 Q Let's turn to -- and a lot of this is still  
11 confidential, but let's go to the third page, I think, Bates  
12 stamp ending 4470.

13 It starts, one summary -- "One slide summary of  
14 what follows."

15 Do you see that?

16 A I do.

17 Q And when you wrote this document in UPX9, you  
18 stated that, "If Incognito actual adoption," and that number  
19 is percent, "is less than X, the monetary impact is likely,  
20 again, X, per year, (perhaps well less)."

21 Do you see that number?

22 A I do.

23 Q And so you had an estimate of what an actual  
24 adoption -- a prediction of what an actual adoption of full  
25 Incognito might be, correct?

1           A     I would probably describe this less as a  
2 prediction and more as a case analysis of a number of  
3 different scenarios.

4           Q     Okay.

5                     You ran a case analysis. You analyzed what the  
6 Incognito Program, if implemented, would have on Google,  
7 agree?

8           A     So Incognito mode already existed, so there was an  
9 Incognito mode with a certain level of adoption that was  
10 already estimated by us.

11                    So this is asking more of a hypothetical of, if  
12 people were to use Incognito at this rate under the  
13 proposal, what might the impact be.

14           Q     But this is a proposal of Incognito++. This is  
15 taking the current Incognito to a different level. Agree?

16           A     So I guess I wouldn't necessarily describe this as  
17 levels of Incognito, but, rather, what would have happened  
18 if Incognito mode functioned differently than it does today,  
19 or did at that time.

20           Q     You stated that if the adoption was X percent,  
21 that it would have an impact of, and I think from back to  
22 your memo, we can say this word, not the actual number, but  
23 it would cost billions of dollars to Google, correct?

24           A     So the slide here expresses an inequality, where  
25 it's noting less than rather than providing an absolute

1 estimate. So that would be an upper bound on the impact,  
2 not necessarily a best effort estimate.

3 Q Okay.

4 And then the next bullet point you say,  
5 "If Incognito adoptions become mainstream," right -- and  
6 that's a much larger view than what your first bullet point  
7 was, correct? Mainstream would be more, do we agree with  
8 that?

9 A I agree.

10 Q "Monetary impact could be X percent as a lower  
11 bound."

12 Do you see that statement?

13 A I do.

14 Q And that number is a magnitude -- is significantly  
15 higher than your number in the first bullet point. Agree?

16 A For some definition of significant.

17 Q It's still billions of dollars, but it's more  
18 billions of dollars than in the first bullet point. Agree?

19 A I agree.

20 Q If Incognito mode, as proposed in your memo on  
21 UPX9, was implemented, it would have significantly harmed  
22 Google's revenue. Agree?

23 A I think that's hard to surmise depending on the  
24 time frame over which one applies it.

25 Q If Google had implemented Incognito mode has

1 proposed in UPX9, Google would have been limited in  
2 opportunities to serve search ads and earn revenue. Agree?

3 A Not necessarily.

4 And I think the ads that we serve might have been  
5 different. I'm not sure we would have forwent the  
6 opportunity to be able to serve ads.

7 Q Let's go to another document.

8 You're familiar -- so we're done with that  
9 document. Thank you, sir.

10 You're familiar with the search ads auction launch  
11 called rGSP. Agree?

12 A I am.

13 Q And rGSP stands for randomized general second  
14 price auction. Correct?

15 A I usually refer to it as generalized rather than  
16 general, but, yes.

17 Q If we can go to UPX1045, which should be in your  
18 binder.

19 And try to expedite this.

20 Let's go to Bates stamp 3390.

21 A I'm sorry, can you please repeat the UPX number?

22 Q Of course.

23 So UPX1045.

24 A Okay.

25 Q And we're going to the -- skipping the email,

1 going to the -- one of the title pages of the deck, Bates  
2 stamp 3390.

3 A Thank you. I've now found it.

4 Q The title is "rGSP AQ ER." Do you see that?

5 A I do.

6 Q And AQ ER stands for ads quality engineering  
7 review?

8 A It does.

9 Q rGSP was a launch that was incorporated into the  
10 Google ad auction in around 2019; is that correct?

11 A Seems right.

12 Q And rGSP is still running in the Google ad  
13 auction today, correct?

14 A That is correct.

15 Q And there's a lot of complexity here, but let's  
16 try to simplify this.

17 Slide deck 3393, we'll turn a couple pages in,  
18 says "In a nutshell."

19 Do you see that slide?

20 A I do.

21 Q So "In a nutshell, rGSP introduces a probability  
22 of swapping between two ads when the LTV scores are close."

23 Do you agree with that statement at a high level?

24 A At a high level, I do.

25 Q "rGSP introduces the probability that the top

1 two ads, ad positions on a SERP can be switched." Agree?

2 A Agreed.

3 Q The second bullet states -- and it's when they're  
4 close, agree, as stated here? When the ultimate LTV scores  
5 of those two ads are close, they can be swapped?

6 A As a general description, that's what's being said  
7 here.

8 Q The second bullet says, "Where FP," which is  
9 format pricing, correct?

10 A Probably.

11 Q "Where format pricing defined a click cost curve  
12 by selling uplift, rGSP defines a click cost curve by  
13 selling a winning probability."

14 Do you see that statement?

15 A I do.

16 Q As part of rGSP, Google is selling not only the  
17 LTV but selling a winning probability. Would you agree with  
18 that?

19 A Not necessarily.

20 Q RGSP swapping only happens when LTV scores are  
21 close. So an advertiser can increase its bid to avoid being  
22 swapped.

23 Would you agree with that?

24 A It's not the only mechanism by which swapping  
25 could be avoided, but it is one of them, yes.

1 Q And all else being equal, how much higher would an  
2 advertiser need to bid in order to exceed the next closest  
3 bid and avoid swapping under rGSP?

4 A I don't recall the magnitude.

5 Q Is it 2X or 3X? Do you recall?

6 A I don't recall. We'd have to look at  
7 documentation.

8 Q Would you agree that a bidder -- the next bidder  
9 needs to bid 3.7 times higher in order to avoid swapping  
10 under rGSP?

11 A I'm not sure.

12 Q Do you think that's probable?

13 A I wouldn't go as far as to say probable. I'd say  
14 possible.

15 Q And to get into the nitty-gritty a little more,  
16 rGSP applies an exponential factor the PCTR term that is  
17 part of the LTV function. Agree?

18 A Can you repeat the question?

19 Q Certainly.

20 rGSP is a mechanism that applies an additional  
21 exponentially factor to the PCTR term within the LTV ad  
22 auction function?

23 A I disagree.

24 Q What -- think back to the simplified LTV equation.  
25 LTV equals bid times PCTR minus beta. Agree?



1           Where does the rGSP exponent apply in that  
2 equation?

3           A     There is no rGSP exponent.

4           Q     All right.

5           Let me ask this very simple question:  Would you  
6 agree that rGSP applies to an exponential factor to a  
7 subset of the PCTR terms within the auction ranking  
8 function?

9           A     No.

10          Q     If you can please turn to your deposition,  
11 October 14th, 2021, page 53, line 12.  Let me know when  
12 you're there.  October 14, 2021, page 53, line 12, through  
13 53, line 17.

14          A     Okay.

15          Q     Sir, were you deposed on October 14th and were you  
16 asked the following question and give the following answer?

17                "What does rGSP do?  Strike my question about  
18 impact.  What does rGSP do?

19                "Answer:  rGSP applies an exponential factor to  
20 a subset of the PCTR terms within the auction ranking  
21 function."

22                Were you asked that question?  Did you give that  
23 answer?

24          A     It looks like I was asked that question.  It looks  
25 like I provided that answer, but it also looks like I

1 confused "launches" when providing that answer.

2 Q Let me -- and we're done with the deposition.

3 A Okay.

4 Q Let me try to take a step back.

5 A Sure.

6 Q The rGSP changes the ad auction LTV equation,  
7 agree?

8 A No.

9 There's another launch that I think we were  
10 discussing during the deposition that does such.

11 Q rGSP is still running today, agree?

12 A Agreed.

13 Q Let's turn in the same document to page 3412.

14 And rGSP has the --

15 A I'm sorry. Which UPX are we looking at?

16 Q Certainly.

17 We're still in the same UPX, UPX1045, and the  
18 Bates number is 3412.

19 A Okay.

20 I'm there.

21 Q Within the ads quality team, the rGSP was given  
22 the code name, "Polyjuice." Do you agree with that?

23 A Seems plausible.

24 Q And do you understand that Polyjuice is a Harry  
25 Potter reference?

1           A     Correct.

2           Q     I have daughters and during COVID, we read all of  
3 the books so I am very familiar with this, unfortunately.

4                     Polyjuice, in Harry Potter, is a magic potion that  
5 allows someone to disguise themselves as someone else.

6           Would you agree with that? Do you know that? Do you know  
7 what the Harry Potter reference to Polyjuice is?

8           A     I did read all the books. I can't say I committed  
9 to memory every single function of each magical item. What  
10 you're describing sounds plausible to me.

11          Q     I didn't memorize all the potions either, but I  
12 remember that one.

13                     As of 2019, when rGSP was being tested, did your  
14 team -- wait. Let me strike the question.

15                     As of 2019, when rGSP was being tested, your  
16 team did not see any evidence that rGSP led to better  
17 quality of ads. Do you agree with that?

18          A     I'm not sure. I'd have to look at the data to see  
19 that.

20          Q     Okay.

21                     In this same document, we're going to go back to  
22 the front of the email so UPX1045, first page. This is a  
23 summary of meeting notes from October 17, 2019, and it looks  
24 like you were one of the attendees at this meeting.

25                     Do you see that?

1           A     I do.

2           Q     If we can go to the second page that ends Bates  
3 stamp 4064, there's a couple comments here, one, two,  
4 three -- the fourth comment down is from somebody that,  
5 I think, you've referenced before as Shiv?

6           A     Correct.

7           Q     And Shiv asks, "Does exploration lead to better  
8 quality?" And the answer from another one of your team  
9 members is "Haven't seen that it does."

10                   Do you see that?

11          A     I do.

12          Q     And do you agree that as of 2019 when rGSP is  
13 being tested, your team did not see that any evidence that  
14 rGSP led to better quality of ads, correct?

15          A     I'm not sure.

16          Q     Okay.

17                   However, rGSP did result in price increases  
18 across all ads on Google, correct?

19          A     Incorrect.

20                   My recollection is that rGSP resulted in a  
21 decrease in costs per click for roughly 40 percent of the ad  
22 clicks.

23                   MR. DAHLQUIST: Your Honor, if I may approach?

24 BY MR. DAHLQUIST:

25          Q     Sir, I've handed you a document that's marked

1 UPX1046.

2 And this document is confidential, so we won't be  
3 able to show it up on the screen. But I'd like to ask you a  
4 question or I'd like to call your attention.

5 UPX1046.

6 MR. DAHLQUIST: And I think, Your Honor, this is  
7 the same topic we've been talking about. So with your  
8 permission, can I read the title?

9 THE COURT: Any objection?

10 MS. WASZMER: No objection.

11 THE COURT: All right.

12 BY MR. DAHLQUIST:

13 Q UPX1046 is entitled "Impact of Polyjuice rGSP  
14 launch on call ads and formats."

15 Do you see that?

16 A I do.

17 Q In the first full paragraph -- or at the bottom,  
18 the last full paragraph under the heading "Call Only Ads."  
19 Do you see that heading?

20 A I do.

21 Q There's a sentence towards the -- the  
22 second-to-last full sentence that starts, "While the."  
23 Do you see that?

24 A I do.

25 Can I please read the entire paragraph just to

1 acquire some context?

2 Q Of course. Please.

3 A Thank you.

4 Okay.

5 Q And let me re-ask my question then in reference  
6 while you're looking at 1046.

7 Would you agree that rGSP resulted in a price  
8 increase across all ads?

9 A I do not.

10 Q All right.

11 Sticking on the same topic of rGSP, let's turn  
12 to UPX59.

13 A Okay. I'm on UPX59.

14 Q You're faster than me.

15 UPX59 is entitled "Randomization we can explain to  
16 advertisers."

17 Do you see that heading?

18 A I do.

19 Q Here, this is a reference to randomization is  
20 rGSP. Do we agree on that?

21 A I'm not sure based only on that title.

22 Q Okay.

23 If you look at the memo, I think the memo here  
24 you're talking about rGSP, maybe some others as well, but,  
25 at a minimum, you're talking about rGSP.

1           Let me look -- let's talk about the -- let's see.  
2   What is confidential in this one?

3           MR. DAHLQUIST: Ms. Gatas-Johnson, could you pull  
4   out for a minute, is the first -- okay. Great. Thank you.  
5   BY MR. DAHLQUIST:

6           Q    Under "Background," let's look at the first full  
7   sentence.

8           States, "There are few important metrics to  
9   advertisers we need to be cognizant of if we want to launch  
10   randomization (and especially if we aim to use these as a  
11   way to replace format pricing)."

12           Do you see that statement?

13           A    I do.

14           Q    Do you now agree that randomization relates to  
15   rGSP?

16           A    It's plausible.

17           Q    In this memo, your team discussed how to explain  
18   rGSP to advertisers, correct?

19           A    Maybe.

20           Q    Let's go -- stay on the first page, about middle,  
21   there's a heading "What are some relevant things" with a  
22   couple bullets below it.

23           Do you see that?

24           A    I do see that section.

25           Q    States, "What are some relevant things that we

1 communicate?"

2           The first bullet point, "The ad with the highest  
3 ad rank gets the highest position, auction position."

4           Do you see that statement?

5           A     I do.

6           Q     The second bullet says "NB." Do you know what  
7 "NB" stands for?

8           A     Oh, I think it's some Latin. I forget what it  
9 stands for, though.

10          Q     It states, "We used to say, 'you pay the minimum  
11 to beat the runner-up' but now we just say that your CPC is  
12 based on your competition and the ad rank threshold. This  
13 gives us freedom to do things like config pricing."

14          Do you see that statement?

15          A     I do.

16          Q     And would you agree that config pricing is another  
17 type of launch at Google?

18          A     Immediately coming to mind is more configuration  
19 auctions than a concept of configuration pricing so I'm not  
20 necessarily sure about that term itself.

21          Q     Configuration pricing is part of the search ads  
22 auction. Would you agree with that?

23          A     It might be an outcome ramification of the  
24 configuration option but, even of that, I'm not entirely  
25 confident.



1           Q     And thanks to my team who just handed me a note  
2 that NB is perhaps nota bene. It means not well. Do you  
3 agree with that? Or note well, meaning, like, well noted?

4           A     Yes, so it sounds like it's probably "please  
5 note."

6           Q     Please note?

7           A     Is probably the vernacular interpretation for  
8 that.

9           Q     Let's turn to the second page where there's a  
10 comment that you made.

11                   And I should have asked -- I mean -- well, you'll  
12 see in a minute. I believe you commented on this memo.  
13 Do you agree with that?

14           A     It's conceivable. It's been a while.

15           Q     I agree.

16                   And I'd like to -- on the second page, under the  
17 heading, "What are some other important considerations" --  
18 and I know this is small print so it's probably using the  
19 paper copy is best.

20                   Do you see the heading "What are some important  
21 considerations." And I want to talk about the last two  
22 bullets in that section.

23                   And maybe we can pull up together with comment 22,  
24 which I believe is your comment. Do you see both of those?

25           A     Could I take a moment to review?

1 Q Of course.

2 A I don't see an attribution on comment 22 so I'm  
3 not necessarily sure who definitively authored it.

4 Q I think in your deposition you agreed that this  
5 was something you most likely said. I can show you that if  
6 you'd like.

7 A I'm happy to believe you that that was what was in  
8 the deposition.

9 Q Looking under this, what are some other important  
10 considerations, the bullet on the screen in front of you,  
11 with reference to UPX59 states, "Easy to tune with the  
12 ability to raise prices (shift the curve upwards or make it  
13 steeper at the higher end) in small increments over time,  
14 (aka 'inflation')." "

15 Do you see that?

16 A I do see that.

17 Q And do you agree that rGSP gave Google ability to  
18 raise prices in small increments over time?

19 A Not necessarily as reflected by the large  
20 parenthetical that's trying to clarify what that thing is  
21 trying to say.

22 Q The next bullet on UPX59 states, "We don't want to  
23 have to stay 'We randomize' - that will have perception  
24 problems."

25 Do you see that?

1           A     I do.

2           Q     And this is the element that you gave a comment  
3 to, I believe, and you have comment 22, and this is your  
4 statement, I believe, "If we say things like 'We run an  
5 auction focused on clicks' - we give the most expected  
6 clicks to the highest ranked advertiser, and so on, then,  
7 yes, I think we can tell a good story."

8                     Do you see that statement?

9           A     I do.

10          Q     And do you agree you made that statement?

11          A     It sounds like a previous instance of me said that  
12 I did.

13                     I at the moment don't have a recollection of  
14 saying so.

15          Q     Okay. I'll take that as a yes.

16                     Your next statement, "If I have to say we randomly  
17 disable you if you don't bid high enough, then I'm going to  
18 have another bad year at GMN, wink emoji."

19                     Do you see that?

20          A     I do.

21          Q     And GMN is what?

22          A     I believe that acronym was Google Marketing Next.

23          Q     And you supported a message to advertisers that  
24 would be the ad auction runs and we give the most clicks to  
25 the highest rank advertiser. Correct? That's what you're

1 saying if we say things like that?

2 A So it appears that I'm making a hypothetical  
3 conjecture here where I say, if we say things like.

4 Q And you had a wink emoji because you knew that  
5 giving that message, "if we randomly disable you," your  
6 statement wouldn't be entirely correct, right?

7 Let me withdraw the question. Let me state a  
8 better question.

9 You were worried about what you would tell  
10 advertising customers at the next GMN meeting on how to  
11 explain rGSP. Agree?

12 A I'm not sure that's what I can infer from this  
13 comment.

14 Q And you added a wink emoji because you knew that  
15 your proposed messaging, being proposed by you and the team,  
16 was not entirely accurate. Agree?

17 A No, that's not my interpretation of this comment  
18 as I read it today.

19 Q Okay.

20 Your Honor, if I can have a minute.

21 THE COURT: Sure.

22 (Plaintiff's counsel conferred off the record.)

23 BY MR. DAHLQUIST:

24 Q Sir, we just made a reference here to GMN.  
25 Is that Google Marketing Next?

1           A     I believe so, yes.

2           Q     And is that a forum where you engage and speak to  
3 advertisers?

4           A     Varies on the year in terms of how active of a  
5 participant I am, but it is such a forum in general.

6           Q     And you've attended GMN before, correct?

7           A     I believe so, yes.

8           MR. DAHLQUIST: Your Honor, no further questions  
9 at this time.

10          THE COURT: All right. Mr. Cavanaugh, anything  
11 from States?

12          MR. CAVANAUGH: No questions, Your Honor.

13          THE COURT: Ms. Waszmer.

14          MS. WASZMER: Your Honor, we're just going to take  
15 a minute to switch up. Thank you.

16                 (Pause)

17          MS. WASZMER: And, Your Honor, before we get  
18 started, we're just going to pass out some binders with a  
19 hard copy of demonstratives that we'll show on the screen.  
20 None of it's confidential.

21                 May I approach?

22          THE COURT: You may.

23

24

25

- - -

CROSS-EXAMINATION

BY MS. WASZMER:

Q Okay.

Dr. Juda, nice to see you. We're going to liven things up a bit before lunch.

MS. WASZMER: Just to make my appearance, Wendy Waszmer on behalf of Google.

BY MS. WASZMER:

Q Dr. Juda, just let me start by getting some background picked up that wasn't picked up yesterday.

Let's just repeat: What is your current role at Google?

A I'm a vice president of product management at Google.

Q Okay.

And I think Mr. Dahlquist asked you briefly about your education, but can you just tell the Court what degrees you had before you came to Google.

THE COURT: I'm sorry, can I just ask you to either move that mic a little closer or keep your voice up.

MS. WASZMER: Sure.

BY MS. WASZMER:

Q Can you start by telling the Court what degrees you had before you came to Google?

1           A     Sure.

2                     So I guess working backwards, my most recent  
3 degree is a Ph.D. in information technology and management  
4 offered by the Harvard Business School and Harvard School of  
5 Engineering and Applied Sciences.

6                     Two years prior, I acquired a master's of science  
7 in computer science from Harvard School of Engineering and  
8 Applied Sciences, the computer science department.

9                     And four years prior to then, I had received a  
10 bachelor's of science in engineering -- in civil and  
11 environmental engineering from Princeton University where I  
12 graduated summa cum laude.

13           Q     Okay.

14                     And I think Mr. Dahlquist asked you about your  
15 Ph.D. just to go back to that for a second.

16                     At any point during your studies, did you study ad  
17 auctions?

18           A     I did.

19           Q     And what did you study, just generally?

20           A     A variety of -- so I guess, in general, auction  
21 design and sort of the place where economic auction design  
22 meets computer science and what's sort of computationally  
23 possible. So from an ads auction perspective, we were  
24 already studying things like search ad auctions, wireless  
25 spectrum auctions, eBay, all sort of kidney exchanges, all

1 sorts of mechanisms to get goods from one set of parties to  
2 another set of parties.

3 Q And we've heard the term "ads quality." Let me  
4 just do ads quality, AQ. At Google what does that team do?

5 A So I think of us in general as managing all of the  
6 processes between a user hitting enter on google.com and  
7 actually seeing search ads in response.

8 So it ranges from identifying which advertisers  
9 would like to show on the search and what ads they would  
10 like to show, followed by evaluating whether we think users  
11 would be interested in seeing said ads.

12 And then finally conducting the auction that  
13 determines which advertisers are going to show on a page.

14 Q And just if it's not obvious from your testimony  
15 yesterday and today, can you explain to the Court why does  
16 Google care about the quality of ads?

17 A So in my mind it's directly consistent with our  
18 company's mission.

19 So Google's mission is to organize the world's  
20 information and make it universally accessible and useful.

21 Ads are commercial information. So in my mind  
22 they very much are directly spoken to within Google's  
23 mission, and so we try to make the ads awesome.

24 Q If Google is able to increase ads quality, what  
25 do you see as flowing from that in terms of any benefits for



1 users or advertisers?

2 A I'm sorry, can you repeat the question?

3 Q Yes.

4 If Google increases ads quality, what, if any,  
5 benefits do you see flowing to users and advertisers from  
6 that?

7 A So on the user front, improving the quality of the  
8 ads that a user sees is more likely to help them achieve  
9 whatever their search goal is, sort of more quickly, more  
10 effectively, which should ultimately result in a happier,  
11 more delighted user population.

12 On the advertiser side, if we're consistently  
13 showing higher quality ads, it increases the likelihood both  
14 of users interacting with those ads in the near term. And  
15 so sending traffic to advertisers' websites, that can help  
16 them sort of sell their goods and services.

17 It also increases the likelihood of users  
18 considering ads in the future, and so should also give  
19 advertisers a greater likelihood on a going-forward basis of  
20 also being able to effectively sell their goods and services  
21 via our ads.

22 Q And, Dr. Juda, yesterday I think Mr. Dahlquist  
23 asked you about the terms "ads blindness" and "ads  
24 sightedness."

25 Do you remember that?

1           A     I do.

2           Q     How, if at all, do those terms play into your  
3 thinking about long-term value and quality of ads?

4           A     So as I've been mentioning earlier, in general  
5 when we're evaluating launches, we try and estimate a more  
6 steady-state, longer-term view on whether launches are good  
7 or bad. And so not only is it interesting to know about the  
8 short-term implications of a launch, but because if the  
9 quality of the experience is changing for users, users'  
10 propensity for clicking on the ads may increase or decrease  
11 in the future, where, if the propensity to click decreases,  
12 that's what we usually refer to as user blindness; if the  
13 propensity for users to click on ads increases, that would  
14 be user sightedness.

15                     We want to take into consideration those long-term  
16 user behavior changes when evaluating a launch.

17           Q     And we'll get this in more detail, but, Dr. Juda,  
18 in the course of your work with ads quality, have you ever  
19 been involved with launches that you predicted would be  
20 rev -- short-term revenue negative?

21           A     Certainly.

22           Q     And have you ever been involved with launches that  
23 you predicted would be revenue neutral?

24           A     Certainly.

25           Q     Okay.

1           Now, let me ask you, in terms of the value to  
2     advertisers and value to users that you just identified,  
3     would the hope be -- what's the hope if advertisers see  
4     value and users see value with regard to long-term revenue?

5           A     That it should hopefully increase over time in a  
6     way that benefits users and advertisers and Google alike.

7           Q     Okay.

8                     I'm going to just address a few of the documents  
9     that Mr. Dahlquist raised before we go to the lunch break.

10                    Can you turn in your binder back to UPX467?

11           A     In the old binders?

12           Q     I'm not going to put this on the screen.  UPX467  
13     in the government's binder.

14                    And I'm not going to refer to specific language,  
15     I'm just going to ask you quickly about some of your  
16     discussion with the Court.  Or just have a look at it.

17           A     So I am at 467.

18           Q     Okay.

19                    And as you recall, this was a document in which  
20     Mr. Dahlquist and the Court asked you questions about Rasta  
21     RPM.

22                    Do you recall that?

23           A     I do.

24           Q     I think in sum and substance you've answered some  
25     of the Court's questions making a distinction between Rasta

1 RPM and revenue that Google may ultimately make as a  
2 company?

3 A Uh-huh.

4 Q Okay.

5 Could you explain that? Why is there a  
6 distinction?

7 A I think it's still a phenomena that we're still  
8 trying to observe to this date.

9 You know, I think, probably in a nutshell, the  
10 answer is, because advertisers respond to our launches in  
11 more magnificent ways than our current methodologies allow  
12 us to estimate.

13 And so even when a launch appears that an  
14 advertiser should be spending, for example, an extra \$10, it  
15 seems in aggregate we don't actually see a \$10 increase in  
16 spend and so something must be happening there.

17 Q Okay.

18 And let me link up your comment to something you  
19 said yesterday.

20 I believe Mr. Dahlquist asked you some questions  
21 about who impacts the auction. Do you recall that?

22 A I do.

23 Q And in some of your testimony, I believe you  
24 mentioned users, advertisers, and Google. Can you explain  
25 what you meant by that?

1           A     Sure.

2                     So users, advertisers, and Google all have roles  
3 to play in terms of what the auction determines as a final  
4 outcome.

5                     So if we focus on advertisers first, they're  
6 providing us things like ad copy, and they're providing us  
7 with landing pages so that the quality signals are a  
8 function of what they're providing us as inputs.

9 Advertisers also give us a maximum cost-per-click bid on an  
10 optional basis, which is going to create the upper bounds at  
11 how much they can possibly be charged. So those are  
12 elements that an advertiser participates in when it comes to  
13 ranking and pricing.

14                    From a user perspective, interesting signals in  
15 our function are things like predict the click-through rate.  
16 Predict the click-through rate is trying to predict the  
17 likelihood of a user to click on ads. And it's -- the  
18 machine learning models that try and come up with that  
19 prediction are grounded on actual user activity. So it  
20 looks like -- it looks at a selection of historical  
21 impressions and a collection of historical clicks to try and  
22 predict the current click-through rate.

23                    So if users aren't clicking on an ad, I would  
24 expect our systems to predict a click-through rate that is  
25 extraordinarily low and so then those ads are unlikely to

1 appear at all on the page.

2 And then, finally, on the Google side, we have,  
3 you know, roles to play such as engineering the functional  
4 form that tries to combine some of the short-term revenue  
5 versus quality aspects of the ads. We're engineering these  
6 machine learning systems to try and predict click-through  
7 rate correctly. We're doing the -- you know, the  
8 multiplication and the subtraction and whatnot to actually  
9 compute a number.

10 Q And I think Mr. Dahlquist has used the term  
11 "control," I'm going to put that in quotes, over the past  
12 two days with questions about whether you and the ads  
13 quality team can control prices.

14 Does the ads quality team control prices at  
15 Google?

16 A I don't believe so.

17 Q And I also believe with regard to this document,  
18 Mr. Dahlquist questions went to whether, through ads  
19 launches, the ads quality team could essentially deliver  
20 20 percent revenue to Google. Is that true?

21 A I don't believe we have that capability.

22 Q Okay.

23 Let's pause and go back to the basics of the ad  
24 auction. And just before --

25 MS. WASZMER: Your Honor, I'll see if I have time.

1 I'm going to go into the simulation of the ad auction.  
2 Maybe I can do that after lunch but just some basics for  
3 Dr. Juda.

4 BY MS. WASZMER:

5 Q Can you just describe -- because we're going to go  
6 from query to how the ad auction works to the ad showing.  
7 Just to start out, an advertiser would like to use -- buy  
8 Google ads and go into the ad auction. How does an  
9 advertiser start with Google?

10 A So one option is that they can use a web browser  
11 to navigate to ads.google.com. That would enable this  
12 business to enter an account creation flow where they would  
13 begin to specify a variety of inputs into the advertising  
14 system, ranging from billing information, such as their  
15 credit card or checking account, an expression of the kinds  
16 of searches they would like to show their ads against, how  
17 much they're willing to pay per click.

18 They may specify a variety of high level targeting  
19 dimensions so they may want to say something like, "Please  
20 only show my ads between 9:00 a.m. and 5:00 p.m. because my  
21 business is only open between those hours."

22 And they would also then provide examples of the  
23 advertising copy. So what is the text that, you know, the  
24 advertiser would like to show the user, as well as to where  
25 should the user be taken if they were the click on an ad.

1           Q     And, Dr. Juda, throughout this trial I think the  
2 Court is going to hear testimony about small advertisers,  
3 large advertisers. In your experience, what size of  
4 advertisers buy Google ads via this interface that you're  
5 talking about?

6           A     So it's a full spectrum. You know, I would say  
7 usually the number of keywords that are physically  
8 convenient to manipulate through the website, I think  
9 typically results in some of our smaller advertisers using  
10 the website in practice.

11                     Whereas some of our larger advertisers, if they  
12 have millions or billions of keywords, are usually  
13 operationalizing that through the API because it's  
14 computationally feasible.

15           Q     Okay.

16                     And just to pause on what the advertiser is able  
17 to do when they start with Google, can advertisers pick  
18 their own keywords if they'd like to as they start to buy  
19 advertising?

20           A     For text ads, they can.

21           Q     Okay.

22                     And for text ads, staying with text ads, can  
23 advertisers set their max CPC or their max bid before they  
24 start to buy advertising?

25           A     That's --



1 Q Is that --

2 A That's an option available to them.

3 Q Now, just staying on max CPCs with text  
4 advertising in the auction, if an advertiser decides to set  
5 a max CPC in a text ad auction, is the cost that they would  
6 pay, will it ever exceed that max CPC?

7 A No. By construction, the actual cost per click  
8 will always be less than or equal to the bid.

9 Q Okay.

10 Are there instances where they'll pay less than  
11 their max CPC once the auction runs?

12 A Yes.

13 Q So let's put up --

14 MS. WASZMER: Your Honor, we're going to give a  
15 table of contents to where I'm going with the exam.

16 Okay. Dr. Juda --

17 THE COURT: I'm sorry to interrupt.

18 Can I ask you a question?

19 I'm coming to the Google website for the first  
20 time to become an advertiser. Does Google provide me any  
21 information that would help me determine what my max CPC is?  
22 In other words, I may not have any idea what a competitive  
23 bid is. So how would I know that if I'm visiting the  
24 website for the first time?

25 THE WITNESS: Sure.

1           So it's an imperfect methodology. But there are  
2 some tools that we provide to advertisers where, if an  
3 advertiser specifies the kinds of searches that they're  
4 interested in advertising on, they can be provided some,  
5 like, rough estimates of what the cost per clicks are on a  
6 particular search.

7           It's a very imprecise estimate because we don't  
8 yet know the quality of the advertisements, we don't know  
9 the margins of the business to know what would be  
10 sustainable or not sustainable.

11           But it can provide at least some basic grounding  
12 of how much clicks for a particular topic might cost.

13           But performance very much can vary.

14           THE COURT: Okay.

15           So I could go to the API -- I don't know if that's  
16 the right word or not. But, in other words, I could provide  
17 certain variables concerning my ads and Google would provide  
18 me some information on potential pricing?

19           THE WITNESS: Yeah.

20           So I don't know if those reports are available via  
21 the API or not, but certainly my recollection is that one  
22 can log into the ads.google.com website, and during the  
23 flow, it can provide you some basic sense for how much costs  
24 might click on average.

25           THE COURT: Thank you.

1 MS. WASZMER: And, Your Honor, I'm about to start  
2 a new section. Would you like me to pause for lunch?

3 THE COURT: Yeah. Why don't we go ahead and just  
4 do that before you launch into the new section.

5 So why don't we take lunch, we'll start at 1:30.

6 Mr. Juda, I'll just ask you not to please discuss  
7 your testimony with anyone during the lunch break.

8 We'll see you all then -- thank you -- afterwards.  
9 Thank you.

10 COURTROOM DEPUTY: All rise. The Court stands in  
11 recess.

12 (Recess from 12:25 p.m. to 1:30 p.m.)  
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C E R T I F I C A T E

I, William P. Zaremba, RMR, CRR, certify that the foregoing is a correct transcript from the record of proceedings in the above-titled matter.

Date: October 4, 2023



William P. Zaremba, RMR, CRR

<p><b>BY MR. DAHLQUIST:</b> [23] 4088/11 4092/7 4098/21 4107/16 4109/20 4111/1 4116/10 4124/3 4140/24 4142/4 4146/3 4148/7 4150/10 4154/6 4155/4 4158/6 4163/11 4167/21 4170/4 4182/24 4183/12 4185/5 4190/23</p> <p><b>BY MS. WASZMER:</b> [4] 4192/3 4192/9 4192/23 4201/4</p> <p><b>COURTROOM</b> <b>DEPUTY:</b> [5] 4087/2 4087/6 4149/17 4149/20 4205/10</p> <p><b>MR. CAVANAUGH:</b> [1] 4191/12</p> <p><b>MR. DAHLQUIST:</b> [30] 4087/15 4087/23 4088/5 4098/20 4107/13 4109/15 4110/18 4110/25 4123/23 4140/23 4149/16 4149/25 4150/6 4150/9 4155/2 4158/5 4162/24 4163/8 4163/25 4164/10 4164/18 4166/11 4166/15 4166/23 4167/17 4167/19 4182/23 4183/6 4185/3 4191/8</p> <p><b>MR. SCHMIDTLEIN:</b> [1] 4087/18</p> <p><b>MS. WASZMER:</b> [23] 4107/11 4109/13 4110/14 4123/20 4155/1 4158/2 4163/5 4163/23 4164/20 4165/7 4165/15 4166/2 4166/7 4166/20 4167/18 4183/10 4191/14 4191/17 4192/7 4192/22 4200/25 4203/14 4205/1</p> <p><b>THE COURT:</b> [65] 4087/4 4087/12 4087/22 4087/25 4088/3 4092/6 4098/19 4107/15 4109/11 4110/21 4115/1 4116/8 4137/14 4137/19 4138/1 4138/5 4139/11 4139/16 4139/22 4140/6 4140/10 4140/13 4140/21 4141/7 4141/9 4141/13 4142/2 4144/15 4144/18 4144/24 4146/2 4147/21 4148/2 4148/6 4149/10 4149/22 4150/5 4150/8 4153/11 4153/25</p>	<p>4154/5 4163/10 4164/7 4164/17 4165/1 4165/10 4165/20 4166/4 4166/9 4166/14 4167/3 4169/18 4169/25 4170/3 4183/9 4183/11 4190/21 4191/10 4191/13 4191/22 4192/20 4203/17 4204/14 4204/25 4205/3</p> <p><b>THE WITNESS:</b> [32] 4088/2 4109/9 4109/12 4109/18 4115/8 4116/9 4137/17 4137/20 4138/3 4138/6 4139/15 4139/17 4140/1 4140/7 4140/12 4140/18 4140/22 4141/8 4141/11 4141/15 4142/3 4144/17 4144/19 4145/4 4147/23 4148/3 4153/13 4154/3 4169/20 4170/1 4203/25 4204/19</p> <p><b>\$</b></p> <p><b>\$10</b> [2] 4198/14 4198/15</p> <p><b>\$100</b> [1] 4152/11</p> <p><b>\$100 billion</b> [1] 4152/11</p> <p><b>'</b></p> <p><b>'actual'</b> [1] 4105/5 <b>'drawer'</b> [1] 4171/16 <b>'inflation'</b> [1] 4188/14 <b>'intentional'</b> [1] 4101/8 <b>'We</b> [2] 4188/23 4189/4 <b>'you</b> [1] 4186/10</p> <p><b>.</b></p> <p><b>.1</b> [1] 4140/4 <b>.2</b> [1] 4140/4 <b>.3</b> [1] 4140/4</p> <p><b>0</b></p> <p><b>002</b> [2] 4104/9 4104/17 <b>0340</b> [1] 4084/4</p> <p><b>1</b></p> <p><b>1 percent</b> [2] 4138/19 4139/3</p> <p><b>1-800</b> [1] 4157/15</p> <p><b>10</b> [3] 4089/19 4089/23 4169/23</p> <p><b>100</b> [2] 4147/18 4147/22</p> <p><b>100 percent</b> [4] 4146/19 4147/4 4147/9 4147/13</p> <p><b>10019</b> [1] 4085/9</p> <p><b>10036-6710</b> [1] 4084/20</p> <p><b>1046</b> [1] 4184/6 <b>10:55</b> [1] 4149/19</p> <p><b>1100</b> [1] 4084/3 <b>1133</b> [1] 4084/19</p>	<p><b>11:00</b> [2] 4149/11 4149/14</p> <p><b>11:13</b> [1] 4149/19</p> <p><b>12</b> [2] 4179/11 4179/12</p> <p><b>12:25</b> [1] 4205/12</p> <p><b>1300</b> [1] 4084/15</p> <p><b>1301</b> [1] 4085/8</p> <p><b>14</b> [1] 4179/12</p> <p><b>14th</b> [5] 4109/16 4109/22 4110/2 4179/11 4179/15</p> <p><b>15</b> [5] 4104/10 4104/18 4126/22 4128/9 4149/13</p> <p><b>15th</b> [5] 4126/9 4126/13 4126/19 4128/7 4128/13</p> <p><b>16</b> [1] 4083/7</p> <p><b>17</b> [2] 4179/13 4181/23</p> <p><b>19</b> [2] 4126/15 4126/19</p> <p><b>1:30</b> [2] 4205/5 4205/12</p> <p><b>2</b></p> <p><b>20</b> [3] 4140/18 4153/24 4154/2</p> <p><b>20 percent</b> [34] 4129/12 4129/19 4129/19 4129/21 4129/23 4130/19 4131/5 4133/21 4133/25 4134/7 4134/18 4134/20 4134/24 4135/1 4136/4 4139/11 4139/12 4139/23 4139/25 4140/9 4140/17 4141/1 4141/5 4145/3 4145/3 4148/11 4148/20 4149/4 4152/21 4153/2 4153/15 4153/23 4154/3 4200/20</p> <p><b>20-3010</b> [2] 4083/4 4087/7</p> <p><b>20001</b> [1] 4085/14</p> <p><b>20024</b> [1] 4085/4</p> <p><b>2018</b> [3] 4098/9 4101/24 4105/10</p> <p><b>2019</b> [10] 4132/3 4132/7 4137/13 4141/4 4160/8 4176/10 4181/13 4181/15 4181/23 4182/12</p> <p><b>202</b> [4] 4084/4 4084/9 4085/4 4085/14</p> <p><b>2020</b> [7] 4131/9 4131/13 4132/7 4150/23 4153/7 4155/21 4156/7</p> <p><b>2021</b> [8] 4109/16 4109/22 4126/10 4126/13 4128/7 4128/13 4179/11 4179/12</p> <p><b>2023</b> [2] 4083/5 4206/7</p> <p><b>209</b> [1] 4084/8</p> <p><b>212</b> [2] 4084/21 4085/9</p> <p><b>22</b> [3] 4187/23 4188/2</p>	<p>4189/3</p> <p><b>2200</b> [1] 4084/20</p> <p><b>24</b> [1] 4128/14</p> <p><b>2793</b> [1] 4084/21</p> <p><b>2870</b> [2] 4104/2 4104/3</p> <p><b>2X</b> [1] 4178/5</p> <p><b>3</b></p> <p><b>3.7</b> [1] 4178/9</p> <p><b>3010</b> [2] 4083/4 4087/7</p> <p><b>307-0340</b> [1] 4084/4</p> <p><b>30th</b> [1] 4105/10</p> <p><b>318</b> [8] 4109/8 4109/16 4109/16 4109/22 4109/22 4109/23 4109/24 4109/25</p> <p><b>3249</b> [1] 4085/14</p> <p><b>332</b> [1] 4142/8</p> <p><b>333</b> [1] 4085/13</p> <p><b>335-2793</b> [1] 4084/21</p> <p><b>3390</b> [2] 4175/20 4176/2</p> <p><b>3393</b> [1] 4176/17</p> <p><b>3412</b> [2] 4180/13 4180/18</p> <p><b>354-3249</b> [1] 4085/14</p> <p><b>3X</b> [1] 4178/5</p> <p><b>4</b></p> <p><b>40 percent</b> [2] 4103/22 4182/21</p> <p><b>401</b> [4] 4126/13 4126/15 4126/18 4126/19</p> <p><b>402</b> [1] 4126/15</p> <p><b>402/1</b> [1] 4126/20</p> <p><b>4064</b> [1] 4182/3</p> <p><b>40th</b> [1] 4085/8</p> <p><b>412</b> [3] 4128/8 4128/9 4128/14</p> <p><b>413</b> [2] 4128/8 4128/14</p> <p><b>434-5000</b> [1] 4085/4</p> <p><b>4407</b> [1] 4160/18</p> <p><b>4408</b> [1] 4161/3</p> <p><b>4420</b> [5] 4160/25 4162/16 4162/17 4164/13 4168/7</p> <p><b>4470</b> [1] 4172/12</p> <p><b>45</b> [1] 4150/2</p> <p><b>455</b> [1] 4158/7</p> <p><b>456</b> [1] 4159/4</p> <p><b>467</b> [1] 4197/17</p> <p><b>497-7702</b> [1] 4085/9</p> <p><b>5</b></p> <p><b>5000</b> [1] 4085/4</p> <p><b>508-6000</b> [1] 4084/16</p> <p><b>509</b> [2] 4104/1 4111/4</p> <p><b>53</b> [3] 4179/11 4179/12 4179/13</p> <p><b>55</b> [1] 4092/9</p> <p><b>580</b> [1] 4112/4</p> <p><b>581</b> [1] 4112/13</p> <p><b>582</b> [1] 4113/1</p> <p><b>5:00 p.m</b> [1] 4201/20</p> <p><b>6</b></p> <p><b>600</b> [1] 4084/8</p> <p><b>6000</b> [1] 4084/16</p>	<p><b>60604</b> [1] 4084/9</p> <p><b>6710</b> [1] 4084/20</p> <p><b>680</b> [1] 4085/3</p> <p><b>7</b></p> <p><b>720</b> [1] 4084/16</p> <p><b>77</b> [1] 4116/15</p> <p><b>7702</b> [1] 4085/9</p> <p><b>772</b> [1] 4116/16</p> <p><b>779</b> [4] 4123/10 4123/16 4123/17 4124/4</p> <p><b>783</b> [3] 4119/8 4119/9 4119/11</p> <p><b>792</b> [1] 4125/6</p> <p><b>7th</b> [1] 4084/15</p> <p><b>8</b></p> <p><b>800</b> [1] 4157/15</p> <p><b>80203</b> [1] 4084/16</p> <p><b>805-8563</b> [1] 4084/9</p> <p><b>8563</b> [1] 4084/9</p> <p><b>874-002</b> [2] 4104/9 4104/17</p> <p><b>9</b></p> <p><b>95</b> [1] 4169/23</p> <p><b>9:00 a.m</b> [1] 4201/20</p> <p><b>9:30</b> [1] 4083/6</p> <p><b>A</b></p> <p><b>a.m</b> [4] 4083/6 4149/19 4149/19 4201/20</p> <p><b>abiding</b> [1] 4154/21</p> <p><b>ability</b> [4] 4107/20 4109/3 4188/12 4188/17</p> <p><b>able</b> [9] 4103/13 4105/19 4133/25 4141/5 4175/6 4183/3 4194/24 4195/20 4202/16</p> <p><b>about</b> [65] 4089/18 4090/7 4090/16 4090/17 4090/21 4091/4 4092/6 4093/16 4094/8 4096/16 4097/1 4097/2 4097/12 4101/13 4102/24 4103/3 4103/5 4107/3 4110/23 4112/22 4117/14 4122/22 4123/1 4125/7 4125/8 4125/9 4129/15 4132/10 4134/11 4149/13 4151/10 4152/9 4156/21 4158/19 4161/1 4165/16 4166/3 4166/7 4167/9 4167/12 4170/1 4171/20 4172/4 4179/17 4183/7 4184/24 4184/25 4185/1 4185/20 4186/20 4187/21 4190/9 4192/17 4193/14 4194/16 4195/23 4196/3 4196/7 4197/15 4197/20</p>
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<b>A</b>	4122/6 4122/11 4134/12 4134/13 4134/16 4136/19 4137/11 4139/13 4139/13 4139/14 4151/20 4156/21 4156/22 4176/10 4176/12 4177/1 4178/21 4180/6 4182/21 4186/2 4186/3 4186/12 4189/24 4193/16 4193/24 4199/6 4199/23 4200/23 4201/1 4201/6 4201/6 4201/8 4201/25 4203/5 <b>ad's [1]</b> 4113/11 <b>ADAM [3]</b> 4088/7 4150/13 4171/16 <b>added [1]</b> 4190/14 <b>addition [5]</b> 4099/7 4101/13 4139/1 4162/8 4162/11 <b>additional [4]</b> 4095/7 4153/18 4157/8 4178/20 <b>additionally [1]</b> 4152/15 <b>address [2]</b> 4087/21 4197/8 <b>addresses [4]</b> 4168/2 4168/9 4168/17 4172/5 <b>adept [1]</b> 4139/18 <b>adjust [1]</b> 4113/19 <b>adjusted [1]</b> 4111/13 <b>adjusting [2]</b> 4113/5 4114/3 <b>adjustments [1]</b> 4157/9 <b>adoption [5]</b> 4172/18 4172/24 4172/24 4173/9 4173/20 <b>adoptions [1]</b> 4174/5 <b>ads [159]</b> <b>ads' [1]</b> 4136/4 <b>ads.google.com [2]</b> 4201/11 4204/22 <b>adventures [2]</b> 4114/13 4116/12 <b>advertisement [2]</b> 4088/20 4089/2 <b>advertisements [1]</b> 4204/8 <b>advertiser [28]</b> 4088/20 4089/21 4095/21 4096/1 4100/13 4100/19 4106/12 4137/3 4139/5 4142/20 4143/4 4143/12 4143/14 4143/16 4177/21 4178/2 4189/6 4189/25 4195/12 4198/14 4199/12 4201/7 4201/9 4201/24 4202/16 4203/4 4203/20 4204/3 <b>advertisers [35]</b> 4091/7 4095/25 4096/4	4096/12 4097/22 4099/8 4124/13 4124/19 4138/24 4184/16 4185/9 4185/18 4189/23 4191/3 4194/8 4194/13 4195/1 4195/5 4195/19 4197/2 4197/3 4197/6 4198/10 4198/24 4199/2 4199/5 4199/9 4202/2 4202/3 4202/4 4202/9 4202/11 4202/17 4202/23 4204/2 <b>advertisers' [3]</b> 4089/1 4143/20 4195/15 <b>advertising [12]</b> 4100/20 4100/21 4124/18 4143/12 4148/18 4190/10 4201/13 4201/23 4202/19 4202/24 4203/4 4204/4 <b>advocate [1]</b> 4150/22 <b>advocated [1]</b> 4151/6 <b>affect [2]</b> 4101/5 4114/8 <b>after [6]</b> 4108/15 4129/24 4149/14 4149/14 4161/3 4201/2 <b>afterwards [1]</b> 4205/8 <b>again [18]</b> 4087/24 4091/22 4091/23 4096/19 4106/6 4106/22 4107/24 4113/2 4114/17 4117/24 4128/18 4134/22 4149/21 4156/18 4162/17 4170/12 4172/7 4172/20 <b>against [10]</b> 4131/1 4135/24 4143/17 4146/1 4153/24 4154/1 4154/3 4163/16 4167/8 4201/16 <b>agent [7]</b> 4169/2 4169/5 4169/8 4169/11 4169/19 4169/21 4169/24 <b>aggregate [9]</b> 4103/1 4108/14 4125/4 4127/25 4128/20 4128/20 4141/5 4141/18 4198/15 <b>aggregated [1]</b> 4100/17 <b>ago [3]</b> 4133/21 4134/11 4158/1 <b>agree [124]</b> 4090/12 4091/9 4093/8 4093/10 4093/22 4094/14 4094/18 4094/21 4094/24 4096/1 4096/20 4097/7 4098/1 4099/2 4099/12 4100/1 4100/4 4100/8 4101/9 4102/7 4103/10	4103/15 4103/18 4105/7 4105/14 4107/17 4108/16 4108/23 4111/14 4113/7 4113/12 4113/16 4113/17 4114/8 4118/15 4119/16 4120/11 4120/18 4120/23 4121/25 4122/4 4122/5 4122/9 4122/20 4123/7 4124/14 4127/9 4127/22 4127/25 4129/6 4129/7 4133/4 4134/1 4134/24 4135/16 4136/2 4143/3 4147/1 4148/12 4149/6 4150/18 4152/25 4153/6 4153/9 4153/10 4154/7 4154/14 4155/16 4156/1 4156/7 4156/11 4160/8 4160/19 4161/12 4162/9 4162/13 4162/21 4163/17 4168/10 4169/5 4169/6 4169/8 4169/9 4169/11 4170/6 4170/10 4170/22 4173/7 4173/15 4174/7 4174/9 4174/15 4174/18 4174/19 4174/22 4175/2 4175/11 4176/23 4177/1 4177/4 4177/17 4177/23 4178/8 4178/17 4178/25 4179/6 4180/7 4180/11 4180/22 4181/6 4181/17 4182/12 4184/7 4184/20 4185/14 4186/16 4186/22 4187/3 4187/13 4187/15 4188/17 4189/10 4190/11 4190/16 <b>agreed [10]</b> 4115/4 4116/20 4116/21 4119/6 4135/17 4162/14 4163/22 4177/2 4180/12 4188/4 <b>agreeing [1]</b> 4120/13 <b>ahead [5]</b> 4110/24 4123/22 4124/1 4149/11 4205/3 <b>aided [1]</b> 4085/16 <b>aim [1]</b> 4185/10 <b>aka [1]</b> 4188/14 <b>al [2]</b> 4083/3 4087/8 <b>albeit [1]</b> 4102/25 <b>algorithm [1]</b> 4089/24 <b>algorithmic [1]</b> 4113/11 <b>algorithms [5]</b> 4088/25 4089/9 4089/14 4093/5 4093/23 <b>aligned [1]</b> 4170/20 <b>alike [1]</b> 4197/6	<b>all [48]</b> 4087/2 4087/12 4087/13 4087/25 4088/3 4095/5 4095/14 4097/25 4098/24 4102/25 4104/8 4106/16 4124/18 4129/12 4131/18 4131/20 4133/8 4138/21 4140/9 4140/10 4143/15 4147/7 4149/15 4149/17 4149/20 4160/9 4163/21 4168/19 4170/23 4171/11 4178/1 4179/4 4181/2 4181/8 4181/11 4182/18 4183/11 4184/8 4184/10 4191/10 4193/25 4193/25 4194/5 4196/2 4199/2 4200/1 4205/8 4205/10 <b>All right [1]</b> 4140/10 <b>allocation [1]</b> 4146/7 <b>allow [2]</b> 4148/11 4198/11 <b>allowed [1]</b> 4109/9 <b>allows [1]</b> 4181/5 <b>alluded [1]</b> 4153/4 <b>allusion [2]</b> 4118/20 4119/3 <b>almost [2]</b> 4137/9 4170/23 <b>alone [2]</b> 4133/21 4133/25 <b>along [2]</b> 4125/19 4130/25 <b>already [4]</b> 4116/19 4173/8 4173/10 4193/24 <b>also [14]</b> 4090/3 4101/5 4144/25 4154/16 4154/18 4157/18 4162/1 4179/25 4195/17 4195/18 4195/20 4199/9 4200/17 4201/22 <b>Although [1]</b> 4131/13 <b>always [2]</b> 4130/6 4203/8 <b>am [15]</b> 4091/24 4109/9 4114/16 4116/13 4116/18 4126/14 4128/11 4150/15 4151/18 4158/5 4158/23 4175/12 4181/3 4191/5 4197/17 <b>ambitions [1]</b> 4159/8 <b>AMERICA [2]</b> 4083/3 4087/7 <b>Americas [2]</b> 4084/19 4085/8 <b>AMIT [2]</b> 4083/9 4087/3 <b>Amit P [1]</b> 4087/3 <b>amount [7]</b> 4100/21 4115/10 4125/2
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<p><b>A</b></p> <p><b>amount...</b> [4] 4132/25 4133/16 4154/4 4154/19</p> <p><b>analysis</b> [3] 4168/24 4173/2 4173/5</p> <p><b>analyzed</b> [1] 4173/5</p> <p><b>annotated</b> [1] 4098/25</p> <p><b>annual</b> [1] 4140/19</p> <p><b>annually</b> [1] 4140/15</p> <p><b>another</b> [15] 4091/14 4096/19 4101/16 4114/7 4141/7 4149/12 4159/1 4162/20 4166/8 4175/7 4180/9 4182/8 4186/16 4189/18 4194/2</p> <p><b>answer</b> [20] 4090/21 4091/5 4098/2 4108/12 4110/3 4110/6 4110/10 4112/20 4121/2 4125/9 4128/15 4128/18 4142/12 4179/16 4179/19 4179/23 4179/25 4180/1 4182/8 4198/10</p> <p><b>answered</b> [1] 4197/24</p> <p><b>answering</b> [1] 4135/19</p> <p><b>anticipate</b> [1] 4150/3</p> <p><b>antitrust</b> [3] 4084/7 4084/13 4157/20</p> <p><b>any</b> [17] 4095/20 4098/22 4119/19 4124/19 4148/14 4161/9 4161/21 4162/19 4167/22 4181/16 4182/13 4183/9 4193/16 4194/25 4195/4 4203/20 4203/22</p> <p><b>anymore</b> [2] 4131/20 4134/1</p> <p><b>anyone</b> [1] 4205/7</p> <p><b>anything</b> [5] 4118/22 4142/13 4143/24 4146/19 4191/10</p> <p><b>API</b> [4] 4088/21 4202/13 4204/15 4204/21</p> <p><b>apologies</b> [1] 4112/2</p> <p><b>apologize</b> [2] 4093/2 4119/10</p> <p><b>appear</b> [6] 4093/9 4110/11 4117/17 4132/2 4143/20 4200/1</p> <p><b>appearance</b> [1] 4192/7</p> <p><b>APPEARANCES</b> [2] 4083/11 4084/23</p> <p><b>appears</b> [11] 4105/12 4118/6 4127/12 4128/23 4146/9 4146/22 4155/22 4157/13 4163/14 4190/2 4198/13</p> <p><b>applied</b> [3] 4160/9 4193/5 4193/8</p> <p><b>applies</b> [5] 4174/24 4178/16 4178/20</p>	<p>4179/6 4179/19</p> <p><b>apply</b> [2] 4137/24 4179/1</p> <p><b>appreciate</b> [3] 4116/8 4131/16 4154/20</p> <p><b>appreciates</b> [1] 4114/24</p> <p><b>approach</b> [2] 4182/23 4191/21</p> <p><b>approaching</b> [3] 4146/18 4147/15 4147/17</p> <p><b>approximate</b> [1] 4136/10</p> <p><b>AQ</b> [6] 4097/11 4099/4 4129/17 4176/4 4176/6 4194/4</p> <p><b>are</b> [100] 4087/14 4087/15 4088/4 4090/2 4090/6 4090/20 4091/21 4094/11 4094/16 4095/2 4095/3 4095/7 4096/12 4096/16 4096/21 4100/20 4101/7 4102/8 4102/16 4103/6 4105/4 4105/19 4108/19 4108/24 4108/25 4109/13 4110/8 4111/13 4113/2 4113/10 4113/10 4113/10 4115/19 4120/2 4121/8 4122/21 4122/21 4124/8 4127/10 4131/24 4132/10 4132/21 4135/6 4136/16 4136/24 4138/21 4138/23 4138/24 4139/1 4141/17 4143/10 4143/16 4144/10 4144/21 4144/25 4145/1 4145/2 4145/7 4145/8 4145/9 4145/10 4145/19 4146/24 4147/25 4147/25 4151/11 4151/16 4156/18 4158/14 4158/20 4165/2 4165/3 4165/5 4170/20 4171/1 4176/22 4177/5 4177/20 4180/15 4185/8 4185/21 4185/25 4187/17 4187/20 4188/9 4194/13 4194/21 4194/22 4196/6 4199/7 4199/11 4199/15 4199/19 4199/25 4202/7 4202/12 4203/10 4204/1 4204/5 4204/20</p> <p><b>area</b> [1] 4142/22</p> <p><b>areas</b> [3] 4126/4 4127/10 4145/1</p> <p><b>aren't</b> [3] 4143/17 4145/21 4199/23</p>	<p><b>arguably</b> [1] 4091/2</p> <p><b>argue</b> [1] 4142/13</p> <p><b>arm's</b> [1] 4168/3</p> <p><b>arms</b> [1] 4141/25</p> <p><b>around</b> [3] 4125/15 4132/7 4176/10</p> <p><b>articulates</b> [1] 4131/7</p> <p><b>articulating</b> [1] 4101/12</p> <p><b>as</b> [111] 4088/8 4090/2 4090/3 4091/4 4095/2 4095/3 4096/24 4097/22 4098/13 4098/16 4100/7 4101/11 4101/11 4101/20 4103/12 4103/13 4103/21 4104/18 4107/2 4107/18 4108/20 4109/2 4109/10 4110/6 4111/12 4111/19 4112/22 4113/21 4113/22 4114/22 4115/25 4115/25 4118/4 4118/7 4118/18 4118/23 4119/1 4124/1 4126/1 4126/3 4126/17 4127/9 4132/1 4132/24 4136/1 4137/21 4139/20 4140/4 4145/22 4147/6 4147/8 4148/16 4148/20 4149/3 4151/19 4151/19 4151/21 4153/4 4153/5 4153/6 4153/15 4154/12 4156/4 4156/4 4156/4 4156/8 4157/3 4160/20 4162/15 4163/17 4164/21 4166/16 4166/23 4169/11 4170/25 4170/25 4172/4 4173/1 4173/2 4173/16 4174/10 4174/20 4175/15 4177/4 4177/6 4177/16 4178/13 4178/13 4181/5 4181/13 4181/15 4182/5 4182/12 4184/24 4185/10 4188/19 4189/15 4190/18 4194/5 4194/25 4196/4 4196/12 4197/19 4198/1 4199/3 4199/8 4200/3 4201/14 4201/24 4201/24 4202/18</p> <p><b>ask</b> [34] 4094/8 4103/5 4106/22 4108/22 4115/2 4116/4 4123/9 4126/17 4127/3 4127/4 4127/8 4127/24 4129/15 4131/25 4134/22 4138/6 4138/9 4141/7 4149/23 4151/5 4151/9 4158/18 4161/1 4163/5 4166/7 4166/20</p>	<p>4179/5 4183/3 4184/5 4192/20 4197/1 4197/15 4203/18 4205/6</p> <p><b>asked</b> [17] 4089/18 4090/20 4091/15 4110/2 4110/15 4125/8 4128/15 4133/20 4179/16 4179/22 4179/24 4187/11 4192/17 4193/14 4195/23 4197/20 4198/20</p> <p><b>asking</b> [4] 4135/19 4141/20 4150/1 4173/11</p> <p><b>asks</b> [1] 4182/7</p> <p><b>aspects</b> [2] 4158/14 4200/5</p> <p><b>assert</b> [1] 4098/4</p> <p><b>assertion</b> [1] 4098/3</p> <p><b>assessment</b> [1] 4115/12</p> <p><b>associated</b> [1] 4089/4</p> <p><b>assumption</b> [1] 4136/13</p> <p><b>assure</b> [1] 4141/14</p> <p><b>asymptote</b> [5] 4146/18 4147/3 4147/12 4147/16 4147/17</p> <p><b>attachment</b> [2] 4112/1 4160/17</p> <p><b>attempt</b> [1] 4095/13</p> <p><b>attended</b> [1] 4191/6</p> <p><b>attendees</b> [1] 4181/24</p> <p><b>attention</b> [5] 4119/21 4123/18 4142/10 4158/16 4183/4</p> <p><b>attribution</b> [1] 4188/2</p> <p><b>auction</b> [77] 4101/6 4102/13 4102/14 4102/19 4102/23 4105/4 4105/15 4105/20 4105/21 4105/24 4106/8 4106/12 4106/14 4106/16 4107/5 4107/7 4107/9 4107/10 4107/18 4107/18 4107/22 4108/1 4108/2 4108/3 4111/10 4111/13 4114/19 4114/20 4116/17 4116/20 4117/2 4118/12 4118/17 4119/23 4120/6 4120/16 4120/20 4121/1 4122/2 4122/6 4122/7 4122/11 4124/4 4124/8 4144/11 4144/14 4145/10 4146/4 4156/15 4156/22 4157/2 4157/4 4175/10 4175/14 4176/10 4176/13 4178/22 4179/7 4179/20 4180/6 4186/3 4186/22 4189/5</p>	<p>4189/24 4193/20 4193/21 4193/23 4194/12 4198/21 4199/3 4200/24 4201/1 4201/6 4201/8 4203/4 4203/5 4203/11</p> <p><b>Auction/Pricing</b> [2] 4144/14 4146/4</p> <p><b>auctions</b> [7] 4105/2 4105/14 4112/9 4186/19 4193/17 4193/24 4193/25</p> <p><b>audience</b> [2] 4141/9 4141/16</p> <p><b>author</b> [2] 4093/20 4098/3</p> <p><b>author's</b> [1] 4122/14</p> <p><b>authored</b> [1] 4188/3</p> <p><b>authoring</b> [1] 4145/5</p> <p><b>Authority</b> [1] 4091/20</p> <p><b>authors</b> [1] 4122/25</p> <p><b>authorship</b> [1] 4093/19</p> <p><b>automatically</b> [1] 4138/14</p> <p><b>available</b> [5] 4109/4 4162/8 4162/13 4203/2 4204/20</p> <p><b>Avenue</b> [4] 4084/19 4085/3 4085/8 4085/13</p> <p><b>average</b> [10] 4103/2 4103/5 4103/6 4103/10 4105/24 4106/8 4138/19 4152/15 4153/9 4204/24</p> <p><b>avoid</b> [3] 4177/21 4178/3 4178/9</p> <p><b>avoided</b> [1] 4177/25</p> <p><b>away</b> [2] 4124/23 4145/23</p> <p><b>awesome</b> [1] 4194/23</p> <hr/> <p><b>B</b></p> <p><b>bachelor's</b> [1] 4193/10</p> <p><b>back</b> [29] 4088/1 4088/16 4090/3 4091/16 4096/25 4096/25 4099/18 4099/22 4103/8 4104/8 4105/13 4116/11 4123/9 4127/12 4127/13 4128/6 4136/9 4136/18 4145/5 4150/11 4160/4 4168/5 4173/21 4178/24 4180/4 4181/21 4193/15 4197/10 4200/23</p> <p><b>background</b> [2] 4185/6 4192/11</p> <p><b>backwards</b> [1] 4193/2</p> <p><b>bad</b> [2] 4189/18 4196/7</p> <p><b>bake</b> [2] 4136/16 4139/6</p> <p><b>ballpark</b> [1] 4125/4</p> <p><b>Barrett</b> [1] 4085/13</p> <p><b>based</b> [2] 4184/21 4186/12</p> <p><b>baseline</b> [2] 4096/24</p>
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<b>B</b>	4181/13 4181/15 4182/13 4190/15 4195/20 <b>belief [3]</b> 4105/2 4144/8 4146/5 <b>beliefs [1]</b> 4139/9 <b>believe [34]</b> 4092/21 4102/18 4103/21 4108/21 4110/16 4110/19 4111/8 4111/11 4118/18 4119/3 4126/24 4128/11 4131/17 4132/22 4144/13 4147/2 4150/25 4152/9 4154/8 4162/1 4164/4 4187/12 4187/24 4188/7 4189/3 4189/4 4189/22 4191/1 4191/7 4198/20 4198/23 4200/16 4200/17 4200/21 <b>believed [3]</b> 4108/9 4126/5 4127/11 <b>believes [1]</b> 4127/14 <b>BELKNAP [1]</b> 4084/18 <b>below [6]</b> 4121/1 4121/21 4126/16 4134/21 4163/6 4185/22 <b>BENCH [1]</b> 4083/9 <b>bene [1]</b> 4187/2 <b>benefits [16]</b> 4093/6 4093/24 4094/5 4094/11 4094/16 4094/25 4095/3 4095/4 4095/5 4095/7 4095/13 4095/21 4095/23 4194/25 4195/5 4197/6 <b>best [5]</b> 4133/15 4134/17 4161/19 4174/2 4187/19 <b>beta [4]</b> 4092/14 4096/21 4117/25 4178/25 <b>better [7]</b> 4099/9 4108/24 4110/7 4181/16 4182/7 4182/14 4190/8 <b>between [11]</b> 4115/24 4139/8 4139/12 4143/3 4143/4 4168/6 4176/22 4194/6 4197/25 4201/20 4201/21 <b>beyond [1]</b> 4132/8 <b>bid [25]</b> 4088/22 4088/22 4089/1 4089/3 4089/4 4089/6 4089/6 4089/10 4090/9 4092/14 4106/13 4106/20 4117/25 4143/4 4143/5 4177/21 4178/2 4178/3 4178/9 4178/25 4189/17 4199/9 4202/23 4203/8 4203/23 <b>bidder [3]</b> 4107/6 4178/8 4178/8	<b>bidders [5]</b> 4105/15 4105/19 4105/21 4107/6 4107/9 <b>billing [1]</b> 4201/14 <b>billion [4]</b> 4125/3 4152/11 4156/9 4157/7 <b>billions [8]</b> 4155/15 4156/2 4159/18 4159/23 4173/23 4174/17 4174/18 4202/12 <b>binder [7]</b> 4091/18 4111/19 4129/3 4160/15 4175/18 4197/10 4197/13 <b>binders [3]</b> 4091/17 4191/18 4197/11 <b>Bing [1]</b> 4168/5 <b>bit [13]</b> 4088/16 4090/17 4091/1 4094/15 4096/17 4105/17 4107/25 4149/10 4149/14 4150/6 4155/17 4168/4 4192/6 <b>blinded [1]</b> 4172/5 <b>blindness [2]</b> 4195/23 4196/12 <b>blocker [1]</b> 4115/23 <b>blush [1]</b> 4112/8 <b>bookable [4]</b> 4134/8 4135/12 4135/16 4135/18 <b>books [2]</b> 4181/3 4181/8 <b>both [4]</b> 4106/1 4151/12 4187/24 4195/13 <b>bottom [3]</b> 4154/11 4157/18 4183/17 <b>bound [3]</b> 4148/4 4174/1 4174/11 <b>boundaries [1]</b> 4128/4 <b>bounds [1]</b> 4199/10 <b>box [7]</b> 4164/17 4165/2 4167/1 4167/4 4167/13 4168/12 4169/2 <b>boxes [5]</b> 4163/21 4163/22 4164/18 4167/24 4170/19 <b>break [3]</b> 4149/11 4197/9 4205/7 <b>briefly [1]</b> 4192/17 <b>bring [1]</b> 4116/11 <b>Broadway [1]</b> 4084/15 <b>broken [1]</b> 4142/11 <b>browser [3]</b> 4162/23 4169/21 4201/10 <b>browsers [1]</b> 4162/1 <b>Bruce [1]</b> 4084/12 <b>bullet [27]</b> 4113/5 4116/22 4116/24 4117/9 4120/15 4123/18 4124/12 4125/14 4125/16 4125/18 4142/6 4142/16 4143/23 4144/14 4146/4	4146/10 4146/15 4174/4 4174/6 4174/15 4174/18 4177/3 4177/8 4186/2 4186/6 4188/10 4188/22 <b>bullets [4]</b> 4144/25 4161/9 4185/22 4187/22 <b>burn [1]</b> 4141/24 <b>business [7]</b> 4152/6 4152/10 4152/11 4193/4 4201/12 4201/21 4204/9 <b>button [1]</b> 4093/4 <b>buy [5]</b> 4155/19 4201/7 4202/4 4202/18 4202/24 <b>C</b> <b>calculation [1]</b> 4106/21 <b>calendar [1]</b> 4131/15 <b>call [9]</b> 4099/19 4101/8 4119/21 4123/18 4141/25 4162/18 4183/4 4183/14 4183/18 <b>called [5]</b> 4117/5 4149/7 4158/20 4162/2 4175/11 <b>Calling [1]</b> 4142/10 <b>came [3]</b> 4153/1 4192/19 4192/25 <b>can [124]</b> 4087/21 4088/20 4088/24 4092/8 4092/24 4093/2 4096/24 4096/25 4100/18 4100/20 4100/21 4101/17 4102/8 4102/14 4102/14 4102/18 4103/4 4103/11 4103/15 4103/18 4104/1 4106/1 4106/6 4106/7 4106/22 4107/13 4108/2 4108/23 4110/13 4110/20 4111/4 4111/16 4111/17 4112/3 4112/18 4113/16 4113/19 4114/8 4114/11 4115/2 4115/3 4115/7 4115/14 4116/14 4117/16 4118/9 4118/13 4118/16 4122/1 4122/6 4122/10 4123/9 4125/6 4126/8 4127/3 4128/19 4134/22 4135/8 4137/9 4137/20 4137/21 4138/6 4138/9 4139/2 4141/7 4144/15 4145/2 4149/23 4150/2 4151/22 4153/17 4156/23 4160/13 4160/14 4160/24 4161/6 4161/24 4162/24 4163/5 4164/3 4164/7 4166/23	4167/13 4168/19 4169/18 4173/22 4175/17 4175/21 4177/1 4177/5 4177/21 4178/18 4179/10 4182/2 4183/8 4183/25 4184/15 4187/23 4188/5 4189/7 4190/12 4190/20 4192/18 4192/20 4192/24 4194/15 4195/2 4195/15 4197/10 4198/24 4199/11 4200/13 4201/2 4201/5 4201/10 4202/17 4202/20 4202/22 4203/18 4204/4 4204/11 4204/13 4204/22 4204/23 <b>can't [10]</b> 4092/18 4106/4 4108/3 4122/19 4122/24 4131/19 4132/17 4133/10 4147/9 4181/8 <b>canceled [1]</b> 4151/8 <b>candidate [4]</b> 4116/25 4116/25 4117/2 4117/5 <b>capability [1]</b> 4200/21 <b>capture [4]</b> 4095/13 4095/14 4115/5 4116/2 <b>captured [2]</b> 4095/3 4095/8 <b>capturing [2]</b> 4095/4 4142/23 <b>card [1]</b> 4201/15 <b>care [2]</b> 4102/23 4194/16 <b>Carr [1]</b> 4084/14 <b>case [7]</b> 4106/24 4140/16 4145/16 4163/14 4167/11 4173/2 4173/5 <b>cases [1]</b> 4106/7 <b>cause [3]</b> 4103/2 4106/25 4142/1 <b>cautious [1]</b> 4161/1 <b>Cavanaugh [3]</b> 4084/18 4087/10 4191/10 <b>ceiling [3]</b> 4146/20 4147/13 4147/21 <b>Center [1]</b> 4084/14 <b>certain [3]</b> 4167/9 4173/9 4204/17 <b>certainly [26]</b> 4098/12 4101/1 4106/1 4106/23 4108/13 4109/15 4109/21 4114/23 4118/14 4126/19 4134/23 4135/9 4148/23 4150/3 4154/15 4156/24 4158/23 4161/25 4164/5 4164/10 4166/23 4178/19 4180/16 4196/21 4196/24 4204/21 <b>certainty [1]</b> 4122/19
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<b>C</b>	4105/5 4108/9 4115/15 4144/21 4177/11 4177/12 4182/21 4196/11 4196/13 4199/9 4199/15 4199/16 4199/17 4199/22 4199/24 4200/6 4201/17 4201/25 4203/7 4204/24 <b>click-through [5]</b> 4199/15 4199/16 4199/22 4199/24 4200/6 <b>clicked [2]</b> 4100/13 4115/20 <b>clicking [7]</b> 4115/22 4136/19 4136/24 4146/25 4147/25 4196/10 4199/23 <b>ClickQuality [3]</b> 4144/8 4144/16 4144/21 <b>clicks [14]</b> 4114/4 4125/5 4136/19 4146/16 4146/19 4147/4 4147/7 4147/9 4182/22 4189/6 4189/24 4199/21 4204/5 4204/12 <b>clicks' [1]</b> 4189/5 <b>climbing [2]</b> 4146/16 4146/25 <b>close [6]</b> 4110/13 4127/3 4176/22 4177/4 4177/5 4177/21 <b>closer [1]</b> 4192/21 <b>closest [1]</b> 4178/2 <b>closing [1]</b> 4105/4 <b>CO [1]</b> 4084/16 <b>coag.gov [1]</b> 4084/17 <b>code [1]</b> 4180/22 <b>cognizant [1]</b> 4185/9 <b>coin [2]</b> 4137/22 4138/10 <b>collaborating [1]</b> 4159/7 <b>collect [1]</b> 4138/4 <b>collected [1]</b> 4161/10 <b>collection [3]</b> 4140/15 4144/4 4199/21 <b>Colorado [3]</b> 4084/12 4084/12 4084/14 <b>COLUMBIA [1]</b> 4083/1 <b>column [5]</b> 4165/4 4165/12 4165/21 4165/24 4170/9 <b>columns [3]</b> 4165/13 4165/15 4165/17 <b>combine [1]</b> 4200/4 <b>come [5]</b> 4099/14 4123/14 4129/24 4149/21 4199/18 4132/15 4132/25 4133/1 4169/20 4199/12 <b>coming [5]</b> 4100/9 4108/24 4110/7	4186/18 4203/19 <b>comment [16]</b> 4104/10 4104/11 4104/14 4104/17 4104/18 4104/20 4182/4 4187/10 4187/23 4187/24 4188/2 4189/2 4189/3 4190/13 4190/17 4198/18 <b>comment 15 [2]</b> 4104/10 4104/18 <b>comment 22 [1]</b> 4187/23 <b>commentary [1]</b> 4145/12 <b>commented [2]</b> 4102/2 4187/12 <b>comments [12]</b> 4098/9 4098/10 4098/12 4098/14 4098/15 4098/18 4098/22 4098/23 4098/24 4102/5 4104/8 4182/3 <b>commercial [1]</b> 4194/21 <b>committed [1]</b> 4181/8 <b>communicate [1]</b> 4186/1 <b>companies [1]</b> 4164/22 <b>companion [1]</b> 4152/16 <b>company [8]</b> 4130/20 4137/10 4153/18 4154/4 4156/5 4164/25 4165/8 4198/2 <b>company's [2]</b> 4165/19 4194/18 <b>compare [1]</b> 4138/15 <b>compared [2]</b> 4164/22 4166/12 <b>compares [1]</b> 4162/20 <b>comparing [3]</b> 4163/12 4163/15 4167/8 <b>comparison [4]</b> 4154/17 4162/23 4165/11 4172/7 <b>competition [9]</b> 4091/20 4105/22 4105/24 4120/9 4120/10 4120/20 4120/25 4149/6 4186/12 <b>competitive [1]</b> 4203/22 <b>competitors [4]</b> 4148/15 4148/19 4149/3 4149/6 <b>complex [1]</b> 4096/19 <b>complexities [1]</b> 4151/8 <b>complexity [1]</b> 4176/15 <b>complicated [1]</b> 4168/4 <b>component [5]</b> 4099/11 4099/13 4100/2 4100/8 4121/4 <b>components [2]</b> 4113/12 4116/2	<b>computed [1]</b> 4107/2 <b>computation [4]</b> 4089/24 4090/11 4095/20 4117/15 <b>computationally [2]</b> 4193/22 4202/14 <b>computations [1]</b> 4113/10 <b>compute [2]</b> 4100/21 4200/9 <b>computer [4]</b> 4085/16 4193/7 4193/8 4193/22 <b>computer-aided [1]</b> 4085/16 <b>conceivable [1]</b> 4187/14 <b>concept [8]</b> 4091/1 4100/18 4111/9 4122/12 4125/24 4136/6 4136/9 4186/19 <b>concepts [1]</b> 4090/6 <b>conceptually [1]</b> 4102/16 <b>concern [4]</b> 4102/11 4134/2 4141/4 4165/13 <b>concerning [1]</b> 4204/17 <b>concerns [1]</b> 4157/20 <b>condition [1]</b> 4091/10 <b>conditions [1]</b> 4114/10 <b>conducting [1]</b> 4194/12 <b>conferred [1]</b> 4190/22 <b>confident [1]</b> 4186/25 <b>confidential [11]</b> 4113/9 4123/12 4131/24 4162/18 4163/24 4164/6 4164/22 4172/11 4183/2 4185/2 4191/20 <b>confidentiality [1]</b> 4164/3 <b>config [2]</b> 4186/13 4186/16 <b>configuration [4]</b> 4186/18 4186/19 4186/21 4186/24 <b>confirm [1]</b> 4126/18 <b>confused [1]</b> 4180/1 <b>conjecture [1]</b> 4190/3 <b>CONNOLLY [1]</b> 4085/3 <b>conservative [2]</b> 4134/8 4135/12 <b>conservatively [1]</b> 4150/2 <b>consider [2]</b> 4101/3 4127/17 <b>consideration [1]</b> 4196/15 <b>considerations [4]</b> 4097/17 4187/17 4187/21 4188/10 <b>considered [3]</b> 4160/8 4164/25 4165/9 <b>considering [2]</b> 4165/19 4195/18 <b>consistent [2]</b> 4117/14 4194/17	<b>consistently [1]</b> 4195/12 <b>Constitution [1]</b> 4085/13 <b>construction [1]</b> 4203/7 <b>Consumer [1]</b> 4084/13 <b>contacts [1]</b> 4157/15 <b>contains [1]</b> 4168/19 <b>contemplated [1]</b> 4167/7 <b>content [2]</b> 4163/6 4163/8 <b>contents [1]</b> 4203/15 <b>context [4]</b> 4143/6 4143/9 4167/11 4184/1 <b>continue [3]</b> 4087/14 4088/17 4158/16 <b>CONTINUED [2]</b> 4085/1 4088/10 <b>continuously [1]</b> 4140/2 <b>contract [1]</b> 4152/1 <b>contribute [1]</b> 4145/14 <b>contributed [3]</b> 4093/19 4136/3 4172/3 <b>contribution [2]</b> 4115/13 4160/7 <b>contributions [1]</b> 4125/11 <b>contributor [1]</b> 4157/19 <b>control [5]</b> 4138/12 4138/20 4200/11 4200/13 4200/14 <b>controls [1]</b> 4170/25 <b>convenient [1]</b> 4202/8 <b>conversation [1]</b> 4093/18 <b>conversations [1]</b> 4093/12 <b>conversion [1]</b> 4097/24 <b>conversions [1]</b> 4099/9 <b>convinced [1]</b> 4168/11 <b>cookie [4]</b> 4170/9 4170/10 4170/13 4170/17 <b>copy [4]</b> 4187/19 4191/19 4199/6 4201/23 <b>core [3]</b> 4151/12 4164/24 4167/11 <b>correct [150]</b> <b>correctly [2]</b> 4145/1 4200/7 <b>cost [20]</b> 4088/22 4097/22 4097/23 4100/10 4100/12 4100/15 4100/23 4100/23 4108/9 4114/4 4159/18 4159/23 4173/23 4177/11 4177/12 4199/9 4203/5 4203/7 4204/5 4204/12 <b>cost-per-click [2]</b> 4088/22 4199/9
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<p><b>C</b></p> <p><b>costs</b> [9] 4093/7 4093/25 4094/12 4095/1 4095/14 4095/24 4097/23 4182/21 4204/23</p> <p><b>could</b> [23] 4096/3 4096/11 4099/14 4100/8 4102/24 4103/1 4103/1 4106/11 4109/6 4109/18 4115/10 4128/6 4143/20 4147/13 4150/11 4174/10 4177/25 4185/3 4187/25 4198/5 4200/19 4204/15 4204/16</p> <p><b>counsel</b> [6] 4109/13 4110/21 4158/2 4163/23 4166/7 4190/22</p> <p><b>counsel's</b> [1] 4115/4</p> <p><b>count</b> [1] 4098/17</p> <p><b>counted</b> [1] 4098/15</p> <p><b>counterparts</b> [1] 4121/9</p> <p><b>couple</b> [6] 4119/10 4123/9 4167/25 4176/17 4182/3 4185/22</p> <p><b>course</b> [8] 4112/24 4120/14 4140/8 4140/20 4175/22 4184/2 4188/1 4196/18</p> <p><b>COURT</b> [15] 4083/1 4085/11 4085/12 4089/18 4110/15 4149/17 4149/20 4152/20 4192/18 4192/24 4194/15 4197/16 4197/20 4202/2 4205/10</p> <p><b>Court's</b> [2] 4140/25 4197/25</p> <p><b>cover</b> [1] 4111/25</p> <p><b>covered</b> [1] 4088/17</p> <p><b>COVID</b> [2] 4151/8 4181/2</p> <p><b>CPA</b> [3] 4099/10 4100/2 4100/14</p> <p><b>CPAs</b> [1] 4100/25</p> <p><b>CPC</b> [17] 4088/22 4089/6 4089/6 4099/10 4100/2 4100/7 4100/10 4100/11 4102/13 4106/15 4114/9 4186/11 4202/23 4203/5 4203/6 4203/11 4203/21</p> <p><b>CPCs</b> [11] 4100/5 4100/9 4100/25 4103/22 4106/17 4108/14 4113/19 4128/1 4128/17 4128/20 4203/3</p> <p><b>create</b> [2] 4125/15 4199/10</p> <p><b>created</b> [1] 4172/1</p>	<p><b>creates</b> [1] 4139/8</p> <p><b>creating</b> [1] 4142/11</p> <p><b>creation</b> [1] 4201/12</p> <p><b>creative</b> [1] 4144/23</p> <p><b>credit</b> [3] 4157/10 4159/21 4201/15</p> <p><b>Crespo</b> [1] 4114/18</p> <p><b>CROSS</b> [2] 4086/4 4192/2</p> <p><b>CROSS-EXAMINATION</b> [1] 4192/2</p> <p><b>CRR</b> [2] 4206/2 4206/8</p> <p><b>CTRs</b> [1] 4099/10</p> <p><b>cum</b> [1] 4193/12</p> <p><b>current</b> [5] 4170/21 4173/15 4192/12 4198/11 4199/22</p> <p><b>currently</b> [2] 4104/14 4162/12</p> <p><b>curve</b> [3] 4177/11 4177/12 4188/12</p> <p><b>customers</b> [1] 4190/10</p> <p><b>CV</b> [1] 4083/4</p> <p><b>cycle</b> [1] 4151/7</p> <hr/> <p><b>D</b></p> <p><b>D.C</b> [4] 4083/5 4084/3 4085/4 4085/14</p> <p><b>Dahlquist</b> [14] 4084/6 4087/24 4088/3 4115/1 4149/23 4166/10 4192/17 4193/14 4195/22 4197/9 4197/20 4198/20 4200/10 4200/18</p> <p><b>Darshan</b> [2] 4150/25 4151/1</p> <p><b>dashboard</b> [1] 4133/12</p> <p><b>data</b> [4] 4138/4 4161/11 4169/12 4181/18</p> <p><b>date</b> [4] 4109/13 4148/23 4198/8 4206/7</p> <p><b>dated</b> [2] 4113/13 4125/24</p> <p><b>Daubert</b> [1] 4087/20</p> <p><b>daughters</b> [1] 4181/2</p> <p><b>David</b> [2] 4084/6 4087/24</p> <p><b>David Dahlquist</b> [1] 4087/24</p> <p><b>david.dahlquist</b> [1] 4084/10</p> <p><b>day</b> [4] 4083/7 4092/5 4146/25 4163/17</p> <p><b>days</b> [2] 4154/17 4200/12</p> <p><b>Dear</b> [1] 4141/17</p> <p><b>decide</b> [2] 4087/18 4102/21</p> <p><b>decided</b> [1] 4166/17</p> <p><b>decides</b> [1] 4203/4</p> <p><b>decisions</b> [1] 4167/9</p> <p><b>deck</b> [3] 4172/2 4176/1 4176/17</p> <p><b>declaring</b> [1] 4147/16</p> <p><b>decrease</b> [2] 4182/21 4196/10</p>	<p><b>decreases</b> [1] 4196/11</p> <p><b>Defendant</b> [2] 4083/7 4085/2</p> <p><b>defense</b> [1] 4157/19</p> <p><b>define</b> [9] 4090/25 4098/6 4126/1 4126/3 4129/15 4136/7 4136/7 4143/8 4159/16</p> <p><b>defined</b> [6] 4099/13 4111/12 4126/1 4127/9 4143/2 4177/11</p> <p><b>defines</b> [1] 4177/12</p> <p><b>defining</b> [1] 4097/22</p> <p><b>definition</b> [11] 4091/9 4098/5 4101/2 4120/21 4121/3 4122/14 4122/18 4130/16 4135/21 4143/19 4174/16</p> <p><b>definitions</b> [5] 4099/15 4099/16 4120/22 4120/23 4135/18</p> <p><b>definitively</b> [3] 4106/5 4122/24 4188/3</p> <p><b>degree</b> [1] 4193/3</p> <p><b>degrees</b> [2] 4192/18 4192/24</p> <p><b>delighted</b> [1] 4195/11</p> <p><b>deliver</b> [2] 4129/12 4200/19</p> <p><b>delivering</b> [1] 4150/13</p> <p><b>delta</b> [1] 4139/12</p> <p><b>demonstratives</b> [1] 4191/19</p> <p><b>Denver</b> [1] 4084/16</p> <p><b>department</b> [4] 4084/2 4084/7 4084/12 4193/8</p> <p><b>depend</b> [2] 4120/21 4122/13</p> <p><b>depending</b> [2] 4128/3 4174/23</p> <p><b>depends</b> [1] 4114/10</p> <p><b>deposed</b> [2] 4128/13 4179/15</p> <p><b>deposition</b> [9] 4109/7 4110/13 4126/9 4128/6 4179/10 4180/2 4180/10 4188/4 4188/8</p> <p><b>describe</b> [9] 4098/13 4098/18 4100/7 4110/6 4154/12 4157/3 4173/1 4173/16 4201/5</p> <p><b>described</b> [3] 4108/18 4118/7 4118/25</p> <p><b>describes</b> [1] 4164/21</p> <p><b>describing</b> [1] 4181/10</p> <p><b>description</b> [1] 4177/6</p> <p><b>design</b> [5] 4164/21 4164/24 4165/8 4193/21 4193/21</p> <p><b>designed</b> [2] 4124/9 4124/13</p> <p><b>detail</b> [4] 4116/23 4167/12 4167/22 4196/17</p> <p><b>detailed</b> [1] 4113/10</p> <p><b>details</b> [1] 4103/24</p> <p><b>determine</b> [1] 4203/21</p>	<p><b>determines</b> [3] 4090/10 4194/13 4199/3</p> <p><b>develops</b> [1] 4117/15</p> <p><b>dictate</b> [1] 4108/3</p> <p><b>did</b> [31] 4110/3 4110/10 4119/9 4126/22 4128/15 4128/16 4128/22 4128/23 4144/12 4144/13 4144/13 4146/8 4146/9 4146/21 4150/23 4151/5 4154/15 4157/12 4157/13 4168/23 4173/19 4179/22 4181/8 4181/13 4181/16 4182/13 4182/17 4189/12 4193/16 4193/18 4193/19</p> <p><b>did you</b> [12] 4110/3 4110/10 4128/22 4144/12 4146/8 4146/21 4150/23 4151/5 4157/12 4179/22 4193/16 4193/19</p> <p><b>didn't</b> [6] 4098/22 4098/25 4106/25 4110/22 4130/10 4181/11</p> <p><b>difference</b> [2] 4143/3 4143/4</p> <p><b>different</b> [8] 4114/4 4135/18 4144/16 4162/10 4162/12 4173/3 4173/15 4175/5</p> <p><b>differently</b> [1] 4173/18</p> <p><b>dimensions</b> [1] 4201/19</p> <p><b>Dintzer</b> [2] 4084/2 4087/9</p> <p><b>direct</b> [4] 4086/4 4088/10 4102/23 4113/21</p> <p><b>directed</b> [1] 4087/20</p> <p><b>directer</b> [1] 4114/19</p> <p><b>Directionally</b> [1] 4154/10</p> <p><b>directions</b> [1] 4106/2</p> <p><b>directly</b> [14] 4101/5 4102/8 4102/12 4102/14 4102/16 4102/18 4103/11 4103/13 4103/15 4103/18 4121/18 4123/6 4194/17 4194/22</p> <p><b>disable</b> [2] 4189/17 4190/5</p> <p><b>disagree</b> [5] 4095/22 4096/6 4120/23 4131/21 4178/23</p> <p><b>disappointing</b> [1] 4115/20</p> <p><b>disclose</b> [1] 4164/16</p> <p><b>disclosed</b> [1] 4165/8</p>	<p><b>discrepancy</b> [1] 4139/8</p> <p><b>discuss</b> [1] 4205/6</p> <p><b>discussed</b> [1] 4185/17</p> <p><b>discussing</b> [1] 4180/10</p> <p><b>discussion</b> [6] 4096/2 4096/7 4097/5 4152/20 4165/19 4197/16</p> <p><b>disjunct</b> [1] 4181/5</p> <p><b>disjoint</b> [1] 4137/9</p> <p><b>display</b> [2] 4151/23 4167/20</p> <p><b>distinct</b> [1] 4136/6</p> <p><b>distinction</b> [3] 4115/24 4197/25 4198/6</p> <p><b>distinguish</b> [1] 4153/11</p> <p><b>DISTRICT</b> [3] 4083/1 4083/1 4083/10</p> <p><b>divide</b> [1] 4100/22</p> <p><b>divided</b> [2] 4138/7 4138/10</p> <p><b>Division</b> [1] 4084/7</p> <p><b>do</b> [238]</p> <p><b>do you</b> [40] 4090/25 4092/15 4093/8 4093/22 4094/14 4097/5 4098/1 4098/11 4099/12 4101/9 4103/15 4103/18 4105/7 4113/7 4120/11 4121/25 4122/5 4124/14 4136/7 4148/19 4149/2 4155/16 4156/7 4160/19 4162/21 4163/17 4166/9 4169/10 4176/23 4178/5 4180/22 4180/24 4181/17 4185/14 4187/13 4188/17 4189/10 4195/25 4197/22 4198/21</p> <p><b>do you have</b> [2] 4148/14 4169/10</p> <p><b>Do you know</b> [2] 4181/6 4181/6</p> <p><b>do you recognize</b> [1] 4160/19</p> <p><b>do you see</b> [72] 4094/6 4097/19 4099/20 4104/10 4104/17 4104/24 4111/22 4112/16 4113/3 4114/1 4114/5 4117/12 4117/22 4118/1 4120/3 4120/7 4121/6 4121/10 4121/19 4121/23 4124/6 4124/10 4125/11 4125/16 4125/20 4132/4 4132/18 4133/22 4134/9 4142/7 4142/14 4142/25 4144/1 4151/14 4152/7 4152/18 4154/22 4155/9 4156/16</p>
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<b>D</b>	<b>DOJ [4]</b> 4084/2 4087/9 4157/19 4157/25 <b>dollars [10]</b> 4115/16 4115/17 4125/3 4155/15 4156/2 4156/9 4157/8 4173/23 4174/17 4174/18 <b>don't [45]</b> 4090/23 4092/13 4093/20 4094/16 4098/13 4098/15 4098/19 4101/11 4103/12 4105/8 4106/10 4107/21 4108/21 4113/8 4113/21 4127/17 4147/2 4149/11 4149/13 4150/8 4160/22 4163/3 4163/6 4164/4 4164/15 4165/4 4166/5 4167/14 4167/19 4169/4 4178/4 4178/6 4188/2 4188/22 4189/13 4189/17 4198/15 4200/16 4200/21 4204/7 4204/8 4204/15 4204/20 4205/3 4205/5 <b>done [9]</b> 4102/8 4111/3 4111/4 4128/25 4149/8 4150/3 4160/14 4175/8 4180/2 <b>down [15]</b> 4091/8 4094/3 4103/1 4103/2 4103/5 4103/22 4106/17 4107/1 4108/2 4111/5 4134/4 4156/13 4156/20 4159/1 4182/4 <b>Dr [4]</b> 4092/2 4129/13 4130/10 4196/17 <b>Dr. [15]</b> 4088/12 4088/15 4107/17 4116/11 4123/9 4124/4 4136/2 4148/8 4150/11 4192/5 4192/10 4195/22 4201/3 4202/1 4203/16 <b>Dr. Juda [15]</b> 4088/12 4088/15 4107/17 4116/11 4123/9 4124/4 4136/2 4148/8 4150/11 4192/5 4192/10 4195/22 4201/3 4202/1 4203/16 <b>draft [2]</b> 4093/11 4093/15 <b>drafted [2]</b> 4093/21 4155/20 <b>drafter [1]</b> 4093/13 <b>drag [1]</b> 4145/25 <b>dramatically [1]</b> 4134/7 <b>drawer [1]</b> 4171/22 <b>draws [1]</b> 4128/3 <b>driven [1]</b> 4100/20 <b>driving [2]</b> 4099/9 4099/10 <b>DuckDuckGo [15]</b> 4163/13 4163/17	4163/21 4165/21 4166/13 4167/9 4167/24 4168/1 4168/9 4169/4 4170/10 4170/19 4170/20 4172/6 4172/7 <b>DuckDuckGo's [1]</b> 4168/4 <b>due [1]</b> 4168/4 <b>dummies [2]</b> 4111/21 4112/7 <b>duration [1]</b> 4112/21 <b>during [5]</b> 4180/10 4181/2 4193/16 4204/22 4205/7 <b>dwell [1]</b> 4112/1 <b>dynamic [1]</b> 4091/2	<b>end [3]</b> 4098/25 4116/5 4188/13 <b>ending [3]</b> 4142/8 4160/25 4172/12 <b>ends [3]</b> 4158/7 4159/4 4182/2 <b>enduring [1]</b> 4141/24 <b>engage [1]</b> 4191/2 <b>engine [3]</b> 4162/21 4162/22 4166/8 <b>engineering [8]</b> 4114/19 4176/6 4193/5 4193/7 4193/10 4193/11 4200/3 4200/5 <b>engineers [1]</b> 4144/22 <b>engineers/stewards [1]</b> 4144/22 <b>engines [4]</b> 4148/16 4151/22 4152/1 4152/3 <b>enough [5]</b> 4123/4 4138/25 4139/5 4139/6 4189/17 <b>ensuring [1]</b> 4154/19 <b>enter [3]</b> 4117/2 4194/6 4201/12 <b>entered [1]</b> 4106/20 <b>entering [1]</b> 4088/21 <b>enters [1]</b> 4106/12 <b>entire [4]</b> 4140/8 4140/20 4172/2 4183/25 <b>entirely [3]</b> 4186/24 4190/6 4190/16 <b>entitled [5]</b> 4091/20 4097/11 4171/15 4183/13 4184/15 <b>entity [1]</b> 4163/2 <b>enumerated [1]</b> 4119/5 <b>enumerating [1]</b> 4120/12 <b>environmental [1]</b> 4193/11 <b>equal [3]</b> 4136/12 4178/1 4203/8 <b>equals [5]</b> 4092/14 4114/3 4114/3 4117/25 4178/25 <b>equation [30]</b> 4092/12 4092/15 4092/19 4092/20 4094/17 4094/20 4094/24 4095/3 4095/9 4095/11 4096/4 4107/2 4112/22 4112/23 4117/20 4117/24 4118/4 4118/11 4118/15 4118/21 4118/23 4119/1 4119/6 4120/19 4120/24 4121/13 4139/24 4178/24 4179/2 4180/6 <b>ER [2]</b> 4176/4 4176/6 <b>especially [1]</b> 4185/10 <b>essentially [1]</b> 4200/19 <b>establish [1]</b> 4166/11 <b>established [3]</b> 4088/19 4099/24 4116/19	<b>establishes [1]</b> 4122/8 <b>estimate [28]</b> 4089/1 4089/9 4089/14 4089/15 4090/10 4094/25 4095/11 4106/19 4133/15 4135/15 4136/15 4136/16 4136/22 4137/1 4137/16 4137/16 4137/18 4138/11 4138/12 4138/22 4139/9 4145/15 4172/23 4174/1 4174/2 4196/5 4198/12 4204/7 <b>estimated [2]</b> 4089/4 4173/10 <b>estimates [1]</b> 4204/5 <b>estimating [1]</b> 4136/23 <b>et [3]</b> 4083/3 4087/8 4099/10 <b>et al [1]</b> 4087/8 <b>et cetera [1]</b> 4099/10 <b>euphemism [1]</b> 4130/12 <b>evaluating [4]</b> 4116/7 4194/10 4196/5 4196/16 <b>even [7]</b> 4107/24 4115/21 4115/23 4166/25 4170/21 4186/24 4198/13 <b>events [1]</b> 4090/12 <b>eventually [3]</b> 4151/7 4168/13 4170/13 <b>ever [10]</b> 4091/5 4118/7 4139/18 4141/20 4141/21 4142/11 4146/17 4196/18 4196/22 4203/6 <b>every [4]</b> 4137/21 4146/25 4167/24 4181/9 <b>everyone [4]</b> 4087/5 4087/12 4141/21 4149/22 <b>everywhere [1]</b> 4162/3 <b>evidence [3]</b> 4091/22 4181/16 4182/13 <b>evidenced [1]</b> 4103/21 <b>exact [1]</b> 4134/20 <b>exactly [1]</b> 4090/23 <b>exam [1]</b> 4203/15 <b>examination [3]</b> 4088/10 4149/24 4192/2 <b>example [5]</b> 4102/21 4105/1 4108/3 4136/18 4198/14 <b>examples [4]</b> 4106/1 4122/22 4171/21 4201/22 <b>exceed [5]</b> 4093/7 4093/25 4105/6 4178/2 4203/6 <b>exceeded [1]</b> 4141/1 <b>exceptions [1]</b> 4106/7
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<b>E</b>	4137/3 4137/4 4178/16 4178/21 4179/6 4179/19 <b>factors [1]</b> 4167/6 <b>factually [1]</b> 4168/11 <b>failure [2]</b> 4120/2 4120/5 <b>fair [9]</b> 4094/1 4095/16 4108/20 4108/24 4110/7 4124/15 4124/22 4127/17 4143/22 <b>fairly [2]</b> 4165/2 4165/5 <b>familiar [13]</b> 4090/23 4111/9 4114/17 4117/20 4117/24 4122/15 4125/22 4129/8 4158/20 4158/23 4175/8 4175/10 4181/3 <b>far [2]</b> 4164/3 4178/13 <b>faster [1]</b> 4184/14 <b>feasible [1]</b> 4202/14 <b>feature [1]</b> 4166/18 <b>features [8]</b> 4165/17 4165/21 4165/22 4165/24 4166/8 4166/16 4167/7 4167/10 <b>February [4]</b> 4150/23 4153/7 4155/21 4156/7 <b>federal [1]</b> 4141/13 <b>feel [2]</b> 4126/17 4145/11 <b>few [5]</b> 4107/6 4129/15 4152/15 4185/8 4197/8 <b>filed [1]</b> 4087/20 <b>final [2]</b> 4145/16 4199/3 <b>finally [2]</b> 4194/12 4200/2 <b>find [1]</b> 4123/8 <b>fine [3]</b> 4167/4 4167/4 4167/14 <b>finishing [1]</b> 4150/3 <b>first [36]</b> 4093/23 4094/8 4094/10 4094/17 4097/16 4097/21 4112/8 4119/21 4123/18 4124/12 4125/14 4125/16 4132/2 4134/6 4155/11 4158/8 4159/5 4161/2 4161/3 4165/3 4165/3 4165/13 4165/15 4168/1 4174/6 4174/15 4174/18 4181/22 4183/17 4185/4 4185/6 4185/20 4186/2 4199/5 4203/19 4203/24 <b>five [5]</b> 4116/22 4152/14 4153/7 4163/21 4167/24 <b>fix [1]</b> 4093/1 <b>flag [1]</b> 4110/14 <b>flavor [4]</b> 4117/21 4118/5 4118/8 4119/1	<b>flip [1]</b> 4137/22 <b>Floor [2]</b> 4084/15 4085/8 <b>flow [2]</b> 4201/12 4204/23 <b>flowing [2]</b> 4194/25 4195/5 <b>focus [5]</b> 4093/22 4097/16 4160/16 4168/25 4199/5 <b>focused [5]</b> 4101/19 4103/7 4135/21 4162/4 4189/5 <b>focusing [2]</b> 4116/24 4167/22 <b>followed [1]</b> 4194/10 <b>following [5]</b> 4110/2 4110/3 4140/25 4179/16 4179/16 <b>follows [2]</b> 4088/9 4172/14 <b>foregoing [1]</b> 4206/3 <b>forget [3]</b> 4093/13 4161/20 4186/8 <b>form [3]</b> 4118/21 4119/4 4200/4 <b>format [7]</b> 4101/7 4103/16 4156/21 4157/1 4177/9 4177/11 4185/11 <b>formats [8]</b> 4099/10 4133/7 4133/14 4156/14 4156/21 4157/4 4157/5 4183/14 <b>former [1]</b> 4105/4 <b>formula [11]</b> 4094/2 4095/17 4095/19 4096/19 4096/20 4097/1 4097/4 4097/8 4113/16 4123/4 4133/20 <b>formulas [1]</b> 4096/8 <b>formulated [1]</b> 4118/14 <b>forth [2]</b> 4141/22 4168/5 <b>forthcoming [1]</b> 4130/14 <b>forum [2]</b> 4191/2 4191/5 <b>forward [8]</b> 4088/18 4091/6 4098/19 4110/20 4128/25 4131/14 4132/7 4195/19 <b>forward-looking [1]</b> 4131/14 <b>forwent [1]</b> 4175/5 <b>found [4]</b> 4091/23 4097/13 4097/14 4176/3 <b>four [1]</b> 4193/9 <b>fourth [1]</b> 4182/4 <b>FP [1]</b> 4177/8 <b>fraction [1]</b> 4146/16 <b>fragile [2]</b> 4129/13 4131/8 <b>frame [1]</b> 4174/24 <b>frankly [1]</b> 4101/2	<b>free [3]</b> 4124/18 4124/23 4126/17 <b>freedom [1]</b> 4186/13 <b>French [1]</b> 4130/7 <b>front [5]</b> 4103/9 4162/7 4181/22 4188/10 4195/7 <b>FTC [2]</b> 4157/14 4157/25 <b>full [13]</b> 4094/3 4094/4 4134/16 4144/7 4148/22 4158/8 4159/5 4172/24 4183/17 4183/18 4183/22 4185/6 4202/6 <b>fully [2]</b> 4095/8 4119/5 <b>function [15]</b> 4102/22 4111/13 4112/20 4113/25 4118/19 4119/5 4121/2 4155/14 4178/17 4178/22 4179/8 4179/21 4181/9 4199/8 4199/15 <b>functional [3]</b> 4118/21 4119/4 4200/3 <b>functionality [1]</b> 4162/2 <b>functioned [1]</b> 4173/18 <b>further [6]</b> 4088/8 4155/15 4156/2 4156/10 4158/3 4191/8 <b>future [5]</b> 4115/22 4115/22 4136/20 4195/18 4196/11	4194/1 4196/17 <b>gets [2]</b> 4117/5 4186/3 <b>getting [3]</b> 4146/6 4166/5 4192/10 <b>give [16]</b> 4110/3 4110/10 4115/16 4115/17 4124/23 4128/15 4130/16 4137/6 4138/11 4179/16 4179/22 4189/5 4189/24 4195/18 4199/9 4203/14 <b>given [5]</b> 4089/21 4092/1 4116/5 4172/8 4180/21 <b>gives [1]</b> 4186/13 <b>giving [3]</b> 4132/24 4133/3 4190/5 <b>glasses [1]</b> 4170/23 <b>GMN [5]</b> 4189/18 4189/21 4190/10 4190/24 4191/6 <b>go [55]</b> 4091/16 4096/25 4101/4 4103/1 4103/2 4103/5 4103/6 4104/7 4106/9 4106/25 4108/4 4109/14 4110/24 4112/3 4112/12 4113/24 4114/12 4115/16 4117/19 4119/8 4123/22 4124/1 4125/5 4130/15 4134/4 4136/18 4147/7 4147/18 4149/9 4149/11 4155/5 4156/13 4156/20 4159/1 4160/15 4160/17 4162/15 4163/8 4164/3 4172/11 4175/7 4175/17 4175/20 4178/13 4181/21 4182/2 4185/20 4193/15 4197/9 4200/23 4201/1 4201/5 4201/8 4204/15 4205/3 <b>go ahead [3]</b> 4110/24 4123/22 4124/1 <b>goal [19]</b> 4112/23 4129/19 4129/20 4129/21 4129/23 4130/19 4134/18 4134/24 4134/25 4136/5 4139/24 4141/5 4141/18 4141/23 4150/4 4153/1 4153/23 4155/18 4195/9 <b>goals [5]</b> 4130/24 4131/18 4136/4 4148/21 4149/4 <b>goes [4]</b> 4090/9 4153/24 4167/11 4168/5 <b>going [71]</b> 4090/16 4091/6 4094/7 4096/16 4096/18 4097/16
<b>F</b>	<b>facing [1]</b> 4148/10 <b>fact [6]</b> 4103/21 4108/15 4108/15 4118/20 4119/4 4136/24 <b>factor [7]</b> 4136/24			

<b>G</b>	4197/13 <b>graduated [1]</b> 4193/12 <b>granularity [1]</b> 4108/11 <b>graphic [1]</b> 4171/6 <b>great [6]</b> 4091/25 4097/15 4120/1 4128/12 4149/25 4185/4 <b>greater [4]</b> 4102/21 4117/11 4117/16 4195/19 <b>gritty [1]</b> 4178/15 <b>grounded [1]</b> 4199/19 <b>grounding [1]</b> 4204/11 <b>group [10]</b> 4099/22 4134/25 4138/12 4138/13 4138/18 4141/1 4144/16 4148/11 4156/25 4156/25 <b>growth [1]</b> 4152/16 <b>grungy [1]</b> 4158/15 <b>guess [11]</b> 4094/10 4102/11 4124/16 4139/20 4145/5 4150/4 4164/2 4168/19 4173/16 4193/2 4193/20	4111/6 4116/22 4121/25 4122/5 4122/9 4124/21 4131/5 4133/25 4138/25 4141/1 4142/22 4142/23 4143/4 4155/14 4157/8 4157/14 4158/8 4165/8 4165/22 4165/24 4166/8 4168/12 4168/12 4169/7 4170/12 4174/25 4180/14 4200/10 <b>hasn't [1]</b> 4138/25 <b>have [102]</b> 4089/4 4090/9 4092/4 4092/13 4092/25 4097/14 4098/3 4099/10 4100/2 4100/8 4101/18 4102/6 4102/15 4103/10 4106/8 4106/10 4106/12 4107/20 4107/21 4108/5 4108/13 4108/18 4109/6 4111/6 4112/23 4117/24 4118/7 4118/25 4119/17 4122/15 4122/25 4123/24 4124/1 4125/24 4126/6 4126/12 4127/4 4131/18 4135/18 4136/17 4138/22 4143/9 4143/20 4145/24 4148/14 4148/22 4150/2 4150/6 4151/2 4152/14 4153/22 4157/10 4159/11 4159/22 4160/9 4160/11 4161/10 4161/20 4162/1 4163/3 4166/18 4166/21 4167/6 4167/19 4168/16 4168/17 4169/10 4169/17 4170/6 4170/16 4170/17 4171/9 4171/12 4172/2 4172/5 4173/6 4173/17 4173/21 4174/21 4175/1 4175/4 4175/5 4178/6 4181/2 4181/18 4187/11 4188/23 4188/23 4189/3 4189/13 4189/16 4189/18 4190/20 4196/18 4196/22 4197/16 4199/2 4200/2 4200/21 4200/25 4202/12 4203/22 <b>haven't [4]</b> 4106/3 4143/2 4148/23 4182/9 <b>having [3]</b> 4088/7 4093/12 4093/17 <b>he [3]</b> 4114/24 4166/20 4166/21 <b>he's [2]</b> 4114/20 4166/5	<b>header [4]</b> 4097/20 4116/19 4142/6 4158/8 <b>heading [21]</b> 4100/9 4113/2 4113/3 4121/6 4121/17 4130/17 4155/6 4155/9 4156/16 4157/14 4157/16 4158/10 4159/5 4161/5 4161/6 4183/18 4183/19 4184/17 4185/21 4187/17 4187/20 <b>headroom [6]</b> 4142/23 4142/23 4143/2 4143/8 4143/15 4143/19 <b>heads [2]</b> 4137/24 4138/11 <b>headwinds [4]</b> 4131/23 4134/5 4148/9 4148/10 <b>hear [1]</b> 4202/2 <b>heard [1]</b> 4194/3 <b>help [5]</b> 4131/20 4142/1 4195/8 4195/15 4203/21 <b>helped [7]</b> 4093/11 4093/15 4093/19 4154/8 4156/9 4159/16 4160/3 <b>here [38]</b> 4095/17 4095/20 4103/8 4103/9 4107/8 4118/19 4119/3 4119/20 4120/6 4122/21 4123/8 4131/24 4139/23 4142/19 4143/15 4144/20 4146/5 4146/18 4147/14 4149/5 4152/24 4153/14 4155/6 4155/11 4158/2 4161/2 4167/6 4168/25 4172/8 4173/24 4176/15 4177/4 4177/7 4182/3 4184/19 4184/23 4190/3 4190/24 <b>high [10]</b> 4106/20 4136/14 4136/21 4144/10 4145/21 4165/6 4176/23 4176/24 4189/17 4201/18 <b>higher [18]</b> 4099/10 4105/25 4108/14 4108/19 4108/25 4110/8 4135/4 4138/19 4146/6 4146/17 4146/25 4146/25 4153/21 4174/15 4178/1 4178/9 4188/13 4195/13 <b>highest [4]</b> 4186/2 4186/3 4189/6 4189/25 <b>highly [1]</b> 4164/22 <b>him [2]</b> 4150/21 4163/5 <b>historical [3]</b> 4155/7 4199/20 4199/21 <b>historically [5]</b> 4130/18 4131/3 4131/4	4136/3 4141/1 <b>history [1]</b> 4154/13 <b>hit [8]</b> 4134/18 4134/19 4134/25 4141/1 4141/5 4145/2 4148/20 4149/3 <b>hitting [1]</b> 4194/6 <b>holding [1]</b> 4136/12 <b>holistic [13]</b> 4115/12 4116/7 4125/7 4125/10 4125/12 4125/22 4126/1 4126/3 4127/9 4127/20 4128/1 4128/16 4137/6 <b>Honor [40]</b> 4087/6 4087/23 4088/5 4091/22 4107/11 4107/14 4110/14 4110/19 4110/25 4123/20 4125/8 4140/23 4149/16 4150/7 4150/9 4162/24 4163/1 4163/9 4164/2 4164/11 4164/19 4164/20 4165/7 4165/15 4166/2 4166/12 4166/20 4166/24 4167/17 4167/18 4182/23 4183/6 4190/20 4191/8 4191/12 4191/14 4191/17 4200/25 4203/14 4205/1 <b>HONORABLE [3]</b> 4083/9 4087/2 4149/20 <b>hope [4]</b> 4088/14 4151/25 4197/3 4197/3 <b>hopefully [2]</b> 4150/2 4197/5 <b>hours [1]</b> 4201/21 <b>how [44]</b> 4090/20 4090/25 4091/20 4092/5 4093/1 4093/13 4093/20 4094/20 4097/1 4097/11 4098/17 4098/18 4102/14 4102/19 4104/22 4130/25 4133/15 4134/8 4135/12 4136/7 4136/16 4137/9 4138/23 4138/23 4143/8 4145/6 4145/13 4150/21 4153/11 4153/17 4160/6 4164/3 4178/1 4185/17 4190/10 4191/4 4196/2 4199/11 4201/6 4201/8 4201/16 4203/23 4204/12 4204/23 <b>However [2]</b> 4118/25 4182/17 <b>huh [1]</b> 4198/3 <b>hundred [1]</b> 4125/2 <b>hydration [1]</b> 4092/4 <b>hypothetical [5]</b> 4091/5 4116/4 4136/11 4173/11 4190/2
	<b>H</b>			
	<b>had [20]</b> 4087/16 4087/20 4088/14 4093/18 4093/20 4096/2 4096/7 4098/10 4106/24 4110/16 4135/22 4143/10 4152/20 4152/21 4172/23 4174/25 4190/4 4192/19 4192/25 4193/9 <b>half [1]</b> 4139/3 <b>hand [2]</b> 4165/18 4167/23 <b>handed [2]</b> 4182/25 4187/1 <b>Handling [1]</b> 4125/11 <b>Hang [2]</b> 4104/5 4111/3 <b>happen [1]</b> 4091/5 <b>happened [2]</b> 4139/17 4173/17 <b>happening [2]</b> 4140/2 4198/16 <b>happens [2]</b> 4097/24 4177/20 <b>happier [1]</b> 4195/10 <b>happy [1]</b> 4188/7 <b>hard [2]</b> 4174/23 4191/19 <b>harder [1]</b> 4141/21 <b>harmed [1]</b> 4174/21 <b>Harry [3]</b> 4180/24 4181/4 4181/7 <b>Harvard [3]</b> 4193/4 4193/4 4193/7 <b>has [35]</b> 4087/19 4094/2 4100/24 4107/7 4108/5 4108/8 4111/2			

<b>I</b>	4152/12	4111/23 4111/25	4182/25 4196/4	<b>impression [1]</b> 4094/11
<b>I am [13]</b> 4091/24 4114/16 4116/13 4116/18 4126/14 4128/11 4150/15 4151/18 4158/5 4175/12 4181/3 4191/5 4197/17	<b>I say [1]</b> 4190/3 <b>I should [1]</b> 4187/11 <b>I think [64]</b> 4088/19 4090/6 4090/14 4090/21 4091/15 4094/9 4094/18 4095/2 4096/24 4098/9 4099/24 4101/10 4104/2 4104/18 4105/1 4106/7 4107/24 4109/2 4110/14 4111/4 4113/14 4114/17 4115/3 4115/11 4116/19 4118/18 4119/12 4120/21 4120/22 4122/16 4123/13 4125/7 4128/25 4139/17 4142/19 4143/22 4144/8 4145/17 4147/6 4154/7 4158/18 4160/14 4160/25 4163/5 4167/4 4172/7 4172/11 4173/21 4174/23 4175/4 4180/9 4182/5 4184/23 4186/8 4188/4 4189/7 4192/17 4193/14 4195/22 4197/24 4198/9 4200/10 4202/1 4202/8	4112/1 4114/24 4115/1 4116/14 4116/16 4117/9 4119/17 4119/21 4120/13 4120/15 4121/16 4122/16 4123/1 4123/8 4126/11 4126/22 4126/24 4131/25 4132/1 4135/11 4135/21 4137/14 4144/15 4146/12 4147/2 4147/6 4147/14 4147/14 4147/15 4147/16 4148/3 4149/10 4153/11 4154/16 4155/2 4155/6 4156/6 4158/2 4158/22 4160/11 4161/17 4162/4 4162/22 4164/7 4165/13 4165/20 4166/3 4166/5 4166/11 4168/11 4169/13 4170/7 4175/5 4175/21 4178/11 4180/15 4180/20 4181/18 4182/15 4184/13 4184/21 4186/19 4186/24 4188/2 4188/7 4189/17 4190/2 4190/12 4192/14 4192/20 4195/2 4197/8 4197/12 4197/14 4197/15 4200/11 4201/1 4203/15 4203/17 4203/19 4203/23 4205/1	<b>ID [2]</b> 4170/9 4170/10 <b>idea [3]</b> 4139/23 4140/8 4203/22 <b>ideally [1]</b> 4140/8 <b>identical [1]</b> 4100/9 <b>identified [1]</b> 4197/2 <b>identifies [1]</b> 4120/5 <b>identify [4]</b> 4126/4 4127/10 4145/19 4163/1 <b>identifying [2]</b> 4145/23 4194/8 <b>IDs [2]</b> 4170/13 4170/17 <b>IL [1]</b> 4084/9 <b>imaginary [1]</b> 4106/24 <b>imagine [5]</b> 4106/11 4115/14 4118/9 4128/19 4139/2 <b>immediate [2]</b> 4136/15 4139/9 <b>immediately [2]</b> 4160/22 4186/18 <b>impact [23]</b> 4100/25 4101/14 4102/9 4103/11 4103/13 4103/18 4111/16 4118/16 4122/10 4123/4 4123/6 4136/15 4145/25 4156/14 4159/24 4160/5 4172/19 4173/13 4173/21 4174/1 4174/10 4179/18 4183/13 <b>impacted [2]</b> 4108/5 4157/1 <b>impacting [3]</b> 4102/17 4119/1 4157/4 <b>impacts [5]</b> 4100/3 4102/19 4112/9 4118/12 4198/21 <b>impeached [1]</b> 4110/16 <b>impeachment [2]</b> 4110/19 4110/20 <b>imperfect [1]</b> 4204/1 <b>implement [2]</b> 4166/17 4167/10 <b>implemented [9]</b> 4111/2 4111/6 4161/15 4161/18 4164/15 4166/1 4173/6 4174/21 4174/25 <b>implication [1]</b> 4107/19 <b>implications [1]</b> 4196/8 <b>implicit [1]</b> 4149/5 <b>implies [1]</b> 4168/21 <b>imply [1]</b> 4102/16 <b>important [6]</b> 4096/16 4158/15 4185/8 4187/17 4187/20 4188/9 <b>imposed [2]</b> 4129/19 4131/19 <b>imprecise [1]</b> 4204/7	<b>impressions [2]</b> 4114/4 4199/21 <b>improve [2]</b> 4099/8 4145/22 <b>improved [1]</b> 4157/10 <b>improvements [5]</b> 4099/9 4145/2 4155/15 4156/3 4156/10 <b>improving [2]</b> 4146/6 4195/7 <b>incidental [4]</b> 4099/19 4100/25 4101/3 4101/14 <b>include [3]</b> 4095/18 4095/20 4165/16 <b>included [3]</b> 4132/16 4133/7 4133/14 <b>including [2]</b> 4088/22 4089/16 <b>incognito [37]</b> 4158/21 4158/23 4158/24 4159/6 4159/8 4159/11 4160/3 4160/9 4160/20 4161/14 4161/18 4161/20 4161/21 4161/23 4161/25 4162/3 4162/5 4162/9 4162/13 4168/24 4170/5 4171/8 4171/16 4172/4 4172/18 4172/25 4173/6 4173/8 4173/9 4173/12 4173/14 4173/15 4173/17 4173/18 4174/5 4174/20 4174/25 <b>incomplete [1]</b> 4155/17 <b>inconsistent [1]</b> 4110/17 <b>incorporated [2]</b> 4155/13 4176/9 <b>incorporating [2]</b> 4156/14 4157/3 <b>Incorrect [2]</b> 4129/22 4182/19 <b>increase [11]</b> 4105/2 4108/8 4129/20 4135/14 4154/9 4177/21 4184/8 4194/24 4196/10 4197/5 4198/15 <b>increased [2]</b> 4111/7 4112/18 <b>increases [7]</b> 4127/15 4127/15 4182/17 4195/4 4195/13 4195/17 4196/13 <b>incredible [1]</b> 4154/18 <b>increments [2]</b> 4188/13 4188/18 <b>INDEX [1]</b> 4086/2 <b>indicating [1]</b> 4136/1 <b>indication [1]</b> 4092/5 <b>indirectly [1]</b> 4114/8 <b>individual [3]</b> 4100/12
<b>I can [12]</b> 4093/2 4106/1 4107/13 4118/9 4128/19 4150/2 4164/3 4166/23 4168/19 4188/5 4190/12 4201/2	<b>I understand [4]</b> 4089/5 4106/6 4146/23 4165/10 <b>I want [3]</b> 4092/17 4164/18 4187/21 <b>I was [14]</b> 4092/6 4093/13 4100/12 4110/18 4111/3 4112/2 4133/13 4144/20 4145/5 4145/11 4155/12 4158/17 4162/16 4179/24 <b>I wouldn't [4]</b> 4114/22 4123/7 4173/16 4178/13 <b>I'd [19]</b> 4088/15 4088/15 4097/1 4116/11 4119/17 4131/25 4142/13 4148/22 4151/9 4157/3 4160/11 4161/1 4162/10 4164/2 4178/13 4181/18 4183/3 4183/4 4187/16 <b>I'll [10]</b> 4099/17 4115/23 4126/17 4131/13 4133/19 4155/3 4164/12 4189/15 4200/25 4205/6 <b>I'm [100]</b> 4089/10 4093/17 4094/4 4094/7 4094/9 4098/16 4098/24 4100/7 4101/1 4101/20 4103/4 4104/3 4104/13 4104/14 4106/22 4109/25	<b>I'm going [6]</b> 4103/4 4112/1 4123/8 4197/8 4200/11 4203/15 <b>I'm just [4]</b> 4094/7 4126/11 4132/1 4197/15 <b>I'm not [11]</b> 4093/17 4098/24 4111/25 4131/25 4147/16 4155/2 4168/11 4169/13 4184/21 4186/19 4197/14 <b>I'm not sure [17]</b> 4098/16 4100/7 4101/20 4119/17 4121/16 4123/1 4148/3 4158/22 4160/11 4161/17 4162/22 4165/13 4170/7 4178/11 4181/18 4182/15 4190/12 <b>I'm sorry [15]</b> 4089/10 4094/4 4104/3 4106/22 4116/16 4126/22 4144/15 4146/12 4149/10 4153/11 4155/6 4164/7 4175/21 4192/20 4195/2 <b>I'm sure [1]</b> 4114/24 <b>I've [7]</b> 4127/1 4130/6 4144/6 4149/25 4176/3	<b>imposed [2]</b> 4129/19 4131/19 <b>imprecise [1]</b> 4204/7	



<b>L</b>	4173/15 4176/23 4176/24 4201/18 <b>levels [2]</b> 4139/2 4173/17 <b>levers [3]</b> 4101/7 4103/10 4103/11 <b>life [1]</b> 4138/7 <b>like [58]</b> 4088/15 4088/15 4093/19 4097/1 4098/17 4098/17 4100/15 4100/18 4109/3 4115/10 4116/11 4124/21 4125/4 4129/8 4133/10 4136/25 4137/23 4144/13 4144/22 4145/8 4150/21 4151/9 4153/14 4153/20 4158/23 4161/1 4164/2 4165/25 4166/7 4169/23 4179/24 4179/25 4179/25 4181/24 4183/3 4183/4 4186/13 4187/3 4187/4 4187/16 4188/6 4189/4 4189/11 4190/1 4190/3 4193/24 4194/9 4194/10 4199/6 4199/15 4199/20 4201/7 4201/16 4201/19 4201/24 4202/18 4204/5 4205/2 <b>likelihood [4]</b> 4195/13 4195/17 4195/19 4199/17 <b>likely [12]</b> 4105/4 4129/13 4131/8 4132/3 4133/17 4135/25 4141/24 4143/14 4144/9 4172/19 4188/5 4195/8 <b>limit [1]</b> 4147/8 <b>limited [4]</b> 4115/10 4131/14 4161/16 4175/1 <b>line [23]</b> 4092/23 4093/5 4095/23 4103/8 4109/16 4109/17 4109/22 4109/23 4109/23 4109/25 4110/1 4119/22 4126/15 4126/15 4126/19 4128/14 4128/14 4128/14 4156/20 4165/3 4179/11 4179/12 4179/13 <b>line 1 [1]</b> 4126/15 <b>line 12 [2]</b> 4179/11 4179/12 <b>line 17 [1]</b> 4179/13 <b>line 19 [2]</b> 4126/15 4126/19 <b>line 3 [1]</b> 4109/23 <b>line 8 [1]</b> 4109/17 <b>link [1]</b> 4198/18 <b>little [13]</b> 4088/16	4090/17 4105/17 4107/25 4130/16 4143/25 4149/10 4149/14 4150/6 4168/4 4171/12 4178/15 4192/21 <b>liven [1]</b> 4192/5 <b>LLC [2]</b> 4083/6 4087/8 <b>LLP [2]</b> 4084/19 4085/3 <b>loaded [1]</b> 4124/1 <b>log [1]</b> 4204/22 <b>long [31]</b> 4090/18 4090/20 4091/14 4092/5 4096/3 4113/25 4115/5 4116/5 4117/5 4117/21 4129/12 4129/25 4130/10 4133/21 4135/2 4136/6 4136/7 4136/9 4137/2 4137/3 4137/5 4137/8 4137/16 4139/9 4139/11 4140/14 4153/15 4164/8 4196/3 4196/15 4197/4 <b>long-term [20]</b> 4090/18 4091/14 4096/3 4115/5 4129/25 4135/2 4136/6 4136/7 4136/9 4137/2 4137/3 4137/5 4137/8 4137/16 4139/9 4139/11 4153/15 4196/3 4196/15 4197/4 <b>longer [4]</b> 4116/1 4116/2 4139/19 4196/6 <b>longer-term [1]</b> 4196/6 <b>look [24]</b> 4092/17 4096/17 4097/10 4104/7 4104/10 4109/6 4111/18 4119/19 4126/9 4126/16 4129/2 4142/16 4145/11 4154/1 4160/11 4165/25 4166/9 4172/2 4178/6 4181/18 4184/23 4185/1 4185/6 4197/16 <b>looked [5]</b> 4091/14 4091/17 4092/12 4096/22 4098/9 <b>looking [22]</b> 4092/23 4095/17 4095/19 4096/5 4096/15 4112/21 4115/21 4116/14 4117/9 4123/5 4124/4 4127/13 4131/14 4132/7 4135/11 4142/5 4150/18 4151/9 4168/7 4180/15 4184/6 4188/9 <b>looks [7]</b> 4144/13 4179/24 4179/24 4179/25 4181/23 4199/20 4199/20 <b>lot [8]</b> 4088/17 4090/15 4103/3 4103/5 4142/22 4171/3 4172/10 4176/15 <b>low [9]</b> 4106/13	4108/10 4121/13 4126/4 4127/10 4136/19 4139/2 4144/9 4199/25 <b>lower [9]</b> 4106/16 4121/8 4125/18 4127/14 4135/5 4140/14 4145/19 4160/4 4174/10 <b>LT [2]</b> 4145/14 4146/1 <b>LT RPM [2]</b> 4145/14 4146/1 <b>LTV [55]</b> 4090/4 4090/5 4090/11 4090/16 4090/17 4092/14 4092/19 4093/5 4093/23 4094/2 4094/20 4094/24 4095/17 4095/19 4096/20 4097/1 4097/4 4097/7 4106/21 4107/2 4112/22 4112/23 4113/16 4115/5 4117/6 4117/10 4117/11 4117/15 4117/16 4117/24 4117/25 4118/4 4118/11 4118/15 4118/23 4119/1 4119/15 4120/19 4120/24 4121/1 4121/13 4123/4 4155/12 4155/24 4156/1 4156/9 4176/22 4177/4 4177/17 4177/20 4178/17 4178/21 4178/24 4178/25 4180/6 <b>lunch [7]</b> 4150/4 4192/6 4197/9 4201/2 4205/2 4205/5 4205/7 <b>luxury [1]</b> 4138/22 <b>lying [1]</b> 4141/19	4131/4 4133/4 4133/8 4136/4 <b>make [23]</b> 4089/5 4098/22 4102/5 4104/5 4108/1 4111/3 4119/18 4120/13 4123/14 4123/21 4128/22 4133/25 4144/12 4146/8 4146/21 4146/23 4157/12 4160/4 4188/12 4192/7 4194/20 4194/23 4198/1 <b>makes [4]</b> 4100/24 4108/12 4137/10 4153/18 <b>making [5]</b> 4126/6 4144/10 4153/20 4190/2 4197/25 <b>man [1]</b> 4155/23 <b>manage [1]</b> 4152/4 <b>management [2]</b> 4192/14 4193/3 <b>manager [6]</b> 4141/16 4141/17 4141/25 4151/12 4155/12 4156/8 <b>managing [1]</b> 4194/5 <b>manipulate [1]</b> 4202/8 <b>many [9]</b> 4092/1 4098/14 4098/18 4125/5 4158/1 4158/9 4158/12 4158/14 4166/18 <b>margins [1]</b> 4204/9 <b>marked [2]</b> 4104/18 4182/25 <b>Marketing [2]</b> 4189/22 4190/25 <b>Markets [1]</b> 4091/20 <b>master's [1]</b> 4193/6 <b>match [1]</b> 4142/20 <b>matched [1]</b> 4166/18 <b>matching [3]</b> 4143/14 4143/17 4145/8 <b>material [2]</b> 4150/7 4163/24 <b>math [1]</b> 4112/15 <b>matter [1]</b> 4206/4 <b>max [10]</b> 4088/22 4088/22 4089/6 4202/23 4202/23 4203/3 4203/5 4203/6 4203/11 4203/21 <b>maximum [1]</b> 4199/9 <b>may [35]</b> 4095/14 4101/14 4106/12 4115/21 4115/25 4119/11 4119/12 4119/15 4120/19 4120/24 4121/5 4134/19 4134/19 4134/20 4134/20 4135/4 4135/15 4135/15 4135/18 4135/24 4140/13 4140/16 4143/24 4148/4 4148/20 4151/2	
			<b>M</b>		
			<b>machine [4]</b> 4169/23 4170/2 4199/18 4200/6 <b>made [19]</b> 4098/10 4098/18 4098/22 4104/20 4105/10 4107/7 4108/5 4115/3 4131/1 4145/2 4152/13 4154/4 4156/22 4156/25 4161/21 4167/9 4187/10 4189/10 4190/24 <b>magic [1]</b> 4181/4 <b>magical [1]</b> 4181/9 <b>magnificent [1]</b> 4198/11 <b>magnitude [3]</b> 4139/4 4174/14 4178/4 <b>main [1]</b> 4156/5 <b>Maine [1]</b> 4085/3 <b>mainstream [2]</b> 4174/5 4174/7 <b>major [2]</b> 4155/7 4155/7 <b>majority [5]</b> 4130/18		



<p><b>M</b></p> <p><b>may...</b> [9] 4162/2 4182/23 4191/21 4191/22 4196/10 4198/1 4201/18 4201/19 4203/22 <b>maybe</b> [14] 4105/13 4105/17 4111/23 4115/15 4115/22 4115/25 4130/15 4162/10 4165/20 4171/12 4184/24 4185/19 4187/23 4201/2</p> <p><b>me</b> [67] 4089/5 4089/10 4090/2 4091/23 4094/7 4095/18 4097/13 4099/2 4099/17 4102/5 4104/5 4104/12 4108/16 4108/22 4109/9 4109/18 4109/24 4111/3 4111/15 4114/15 4115/15 4115/21 4115/22 4118/3 4118/24 4126/2 4126/24 4127/3 4127/8 4127/24 4128/9 4130/21 4133/13 4141/13 4145/17 4146/23 4150/14 4151/5 4153/4 4153/14 4153/19 4155/2 4156/19 4163/25 4165/4 4167/5 4179/5 4179/11 4180/2 4180/4 4181/10 4181/14 4184/5 4184/14 4185/1 4187/1 4189/11 4190/7 4190/7 4192/10 4194/3 4197/1 4198/18 4203/20 4203/21 4204/18 4205/2</p> <p><b>mean</b> [15] 4115/7 4118/18 4124/16 4124/17 4139/19 4147/22 4153/19 4154/25 4158/12 4161/20 4165/5 4167/6 4169/19 4170/24 4187/11</p> <p><b>meaning</b> [3] 4151/17 4169/7 4187/3</p> <p><b>means</b> [7] 4105/21 4119/12 4121/12 4124/19 4124/20 4139/12 4187/2</p> <p><b>meant</b> [1] 4198/25</p> <p><b>measure</b> [4] 4112/15 4131/1 4140/3 4153/25</p> <p><b>measured</b> [3] 4154/1 4156/4 4156/4</p> <p><b>measurement</b> [1] 4107/1</p> <p><b>measuring</b> [1] 4139/18</p> <p><b>mechanical</b> [1] 4085/15</p>	<p><b>mechanism</b> [5] 4111/12 4122/7 4124/17 4177/24 4178/20</p> <p><b>mechanisms</b> [11] 4101/6 4102/10 4121/21 4122/1 4122/5 4122/20 4123/5 4124/5 4124/9 4157/10 4194/1</p> <p><b>meet</b> [1] 4131/19</p> <p><b>meeting</b> [3] 4181/23 4181/24 4190/10</p> <p><b>meets</b> [1] 4193/22</p> <p><b>MEHTA</b> [2] 4083/9 4087/3</p> <p><b>member</b> [3] 4101/23 4101/25 4114/23</p> <p><b>members</b> [2] 4122/15 4182/9</p> <p><b>memo</b> [25] 4097/11 4098/8 4104/21 4131/11 4131/17 4132/6 4135/21 4137/12 4137/13 4141/2 4148/8 4148/14 4148/25 4149/2 4150/17 4153/7 4155/20 4156/8 4159/21 4173/22 4174/20 4184/23 4184/23 4185/17 4187/12</p> <p><b>memorize</b> [1] 4181/11</p> <p><b>memory</b> [1] 4181/9</p> <p><b>mental</b> [1] 4145/6</p> <p><b>mention</b> [3] 4148/15 4148/19 4149/3</p> <p><b>mentioned</b> [5] 4095/2 4103/12 4109/2 4139/20 4198/24</p> <p><b>mentioning</b> [1] 4196/4</p> <p><b>Merit</b> [1] 4085/11</p> <p><b>message</b> [2] 4189/23 4190/5</p> <p><b>messaging</b> [1] 4190/15</p> <p><b>metadata</b> [1] 4169/21</p> <p><b>methodologies</b> [1] 4198/11</p> <p><b>methodology</b> [1] 4204/1</p> <p><b>metric</b> [1] 4100/17</p> <p><b>metrics</b> [1] 4185/8</p> <p><b>mic</b> [1] 4192/21</p> <p><b>middle</b> [1] 4185/20</p> <p><b>might</b> [27] 4091/7 4092/5 4095/7 4105/3 4105/6 4113/13 4115/9 4115/11 4116/5 4121/14 4121/14 4133/25 4141/5 4145/12 4145/13 4146/17 4147/15 4148/10 4160/25 4169/22 4169/24 4172/25 4173/13 4175/4 4186/23 4204/12 4204/24</p> <p><b>mille</b> [1] 4130/7</p>	<p><b>millions</b> [1] 4202/12</p> <p><b>mind</b> [14] 4102/13 4102/15 4103/12 4109/4 4120/12 4124/16 4127/4 4135/19 4135/22 4143/10 4169/20 4186/18 4194/17 4194/21</p> <p><b>mine</b> [1] 4114/22</p> <p><b>minimum</b> [3] 4166/24 4184/25 4186/10</p> <p><b>minus</b> [5] 4092/14 4117/25 4171/5 4171/6 4178/25</p> <p><b>minute</b> [8] 4099/1 4134/11 4148/25 4168/23 4185/4 4187/12 4190/20 4191/15</p> <p><b>minutes</b> [2] 4149/13 4150/2</p> <p><b>misdirect</b> [1] 4126/22</p> <p><b>Misread</b> [1] 4107/11</p> <p><b>mission</b> [3] 4194/18 4194/19 4194/23</p> <p><b>mode</b> [14] 4158/24 4161/20 4161/21 4161/23 4161/23 4161/25 4162/5 4162/9 4162/13 4173/8 4173/9 4173/18 4174/20 4174/25</p> <p><b>model</b> [1] 4145/6</p> <p><b>models</b> [2] 4144/23 4199/18</p> <p><b>modest</b> [1] 4133/18</p> <p><b>moment</b> [9] 4113/14 4115/11 4115/18 4115/25 4116/3 4126/16 4169/14 4187/25 4189/13</p> <p><b>monetary</b> [2] 4172/19 4174/10</p> <p><b>more</b> [70] 4090/2 4090/16 4095/9 4096/17 4096/19 4100/17 4102/24 4105/15 4105/17 4105/19 4105/21 4105/21 4105/24 4106/8 4107/9 4108/20 4108/22 4108/24 4110/7 4110/7 4115/12 4116/7 4116/22 4117/19 4119/17 4121/18 4122/1 4122/2 4127/24 4130/16 4131/7 4131/14 4133/20 4134/7 4135/12 4137/6 4139/18 4140/2 4141/23 4142/11 4143/20 4144/9 4145/18 4145/23 4146/5 4147/9 4150/6 4150/21 4157/3 4159/12 4159/14</p>	<p>4162/8 4162/10 4162/12 4164/7 4171/5 4171/12 4173/2 4173/11 4174/7 4174/17 4178/15 4186/18 4195/8 4195/9 4195/9 4195/11 4196/5 4196/17 4198/11</p> <p><b>morning</b> [9] 4083/7 4087/4 4087/6 4087/12 4087/23 4087/25 4088/2 4088/12 4088/13</p> <p><b>most</b> [14] 4099/4 4099/7 4100/2 4100/4 4100/24 4120/1 4132/15 4133/16 4139/1 4154/12 4188/5 4189/5 4189/24 4193/2</p> <p><b>motion</b> [1] 4087/20</p> <p><b>move</b> [11] 4088/17 4098/19 4098/20 4099/2 4110/20 4125/15 4125/19 4149/12 4155/3 4171/11 4192/21</p> <p><b>moving</b> [3] 4094/3 4128/25 4158/5</p> <p><b>Mr.</b> [18] 4087/14 4087/25 4088/3 4115/1 4115/2 4149/23 4150/24 4166/10 4191/10 4192/17 4193/14 4195/22 4197/9 4197/20 4198/20 4200/10 4200/18 4205/6</p> <p><b>Mr. Cavanaugh</b> [1] 4191/10</p> <p><b>Mr. Dahlquist</b> [12] 4088/3 4115/1 4149/23 4166/10 4192/17 4193/14 4195/22 4197/9 4197/20 4198/20 4200/10 4200/18</p> <p><b>Mr. Juda</b> [4] 4087/14 4087/25 4115/2 4205/6</p> <p><b>Mr. Tischler</b> [1] 4150/24</p> <p><b>Ms.</b> [2] 4185/3 4191/13</p> <p><b>Ms. Gatas-Johnson</b> [1] 4185/3</p> <p><b>Ms. Waszmer</b> [1] 4191/13</p> <p><b>much</b> [19] 4093/3 4093/20 4104/22 4132/16 4133/15 4136/23 4137/9 4138/21 4143/25 4149/15 4153/18 4174/6 4178/1 4194/22 4199/11 4201/17 4204/12 4204/13 4204/23</p> <p><b>multiple</b> [2] 4099/23 4166/16</p> <p><b>multiplication</b> [1]</p>	<p>4200/8</p> <p><b>multitude</b> [2] 4098/10 4098/13</p> <p><b>must</b> [3] 4117/11 4148/4 4198/16</p> <p><b>my</b> [47] 4092/25 4102/11 4102/13 4102/15 4103/6 4103/12 4109/4 4112/2 4119/14 4123/13 4123/13 4124/16 4126/17 4132/9 4134/2 4141/3 4141/16 4141/16 4141/20 4141/22 4141/25 4145/6 4145/23 4147/23 4149/2 4150/22 4157/10 4159/13 4160/6 4163/19 4167/15 4168/3 4169/20 4179/17 4182/20 4184/5 4187/1 4190/17 4192/7 4193/2 4194/17 4194/21 4201/20 4201/20 4203/21 4204/17 4204/21</p> <p><b>myself</b> [3] 4101/3 4122/13 4150/1</p>
<b>N</b>				
<p><b>naively</b> [1] 4115/9</p> <p><b>name</b> [7] 4114/17 4129/4 4144/21 4158/22 4162/25 4163/6 4180/22</p> <p><b>naturally</b> [1] 4124/19</p> <p><b>nav</b> [1] 4132/17</p> <p><b>navigate</b> [1] 4201/11</p> <p><b>NB</b> [3] 4186/6 4186/7 4187/2</p> <p><b>near</b> [1] 4195/14</p> <p><b>necessarily</b> [22] 4100/7 4101/21 4103/13 4114/22 4122/4 4122/13 4127/23 4128/3 4138/25 4139/4 4147/16 4153/19 4157/4 4161/13 4170/8 4173/16 4174/2 4175/3 4177/19 4186/20 4188/3 4188/19</p> <p><b>need</b> [12] 4103/4 4104/21 4121/18 4121/21 4126/16 4131/20 4133/21 4164/15 4166/22 4170/23 4178/2 4185/9</p> <p><b>needs</b> [3] 4159/23 4167/16 4178/9</p> <p><b>negates</b> [1] 4109/4</p> <p><b>negative</b> [3] 4140/4 4145/24 4196/20</p> <p><b>negatively</b> [1] 4145/14</p> <p><b>negligibly</b> [1] 4091/11</p> <p><b>net</b> [2] 4108/13 4145/24</p>				

<b>N</b>	4181/23 <b>nothing [1]</b> 4091/5 <b>noting [1]</b> 4173/25 <b>notion [1]</b> 4109/2 <b>now [19]</b> 4090/14 4090/16 4092/13 4093/4 4095/17 4097/1 4112/3 4117/20 4128/6 4134/7 4141/4 4154/15 4163/24 4167/8 4176/3 4185/14 4186/11 4197/1 4203/3 <b>nowhere [3]</b> 4148/14 4148/19 4149/2 <b>number [34]</b> 4089/16 4092/9 4098/15 4100/19 4100/22 4133/7 4133/16 4135/25 4140/15 4142/6 4145/3 4146/24 4148/3 4152/5 4152/24 4152/25 4153/14 4153/17 4153/23 4154/1 4157/1 4159/25 4161/8 4164/14 4172/18 4172/21 4173/2 4173/22 4174/14 4174/15 4175/21 4180/18 4200/9 4202/7 <b>numbers [8]</b> 4131/24 4132/24 4132/24 4133/3 4133/13 4138/15 4147/18 4156/18 <b>nutshell [4]</b> 4112/14 4176/18 4176/21 4198/9 <b>NW [2]</b> 4084/3 4085/13 <b>NY [2]</b> 4084/20 4085/9	<b>October 17 [1]</b> 4181/23 <b>odds [2]</b> 4110/22 4115/19 <b>off [4]</b> 4090/14 4096/25 4097/11 4190/22 <b>offered [1]</b> 4193/4 <b>Official [1]</b> 4085/12 <b>offset [2]</b> 4094/12 4094/25 <b>Oh [5]</b> 4111/24 4123/24 4126/22 4139/21 4186/8 <b>okay [78]</b> 4087/22 4089/13 4091/13 4092/3 4092/22 4093/14 4094/9 4094/23 4095/6 4095/10 4096/14 4098/7 4102/4 4104/16 4112/2 4112/5 4113/23 4119/19 4123/25 4124/2 4126/7 4126/21 4127/1 4127/2 4127/19 4128/5 4128/25 4131/22 4132/23 4134/3 4135/20 4135/23 4139/16 4140/21 4142/2 4143/7 4146/2 4148/6 4150/5 4150/16 4151/4 4154/5 4158/25 4163/10 4163/25 4168/22 4169/15 4169/25 4170/3 4171/7 4173/4 4174/3 4175/24 4179/14 4180/3 4180/19 4181/20 4182/16 4184/4 4184/13 4184/22 4185/4 4189/15 4190/19 4192/4 4192/16 4193/13 4196/25 4197/7 4197/18 4198/4 4198/17 4200/22 4202/15 4202/21 4203/9 4203/16 4204/14 <b>OKR [14]</b> 4130/19 4130/19 4130/22 4131/5 4134/7 4134/24 4135/25 4141/2 4146/1 4148/11 4148/20 4152/21 4153/2 4156/4 <b>old [2]</b> 4108/19 4197/11 <b>once [1]</b> 4203/11 <b>one [44]</b> 4088/24 4090/2 4094/5 4097/3 4104/7 4107/5 4107/6 4108/22 4112/21 4115/9 4117/19 4120/6 4125/5 4128/3 4128/7 4128/19 4131/8 4137/17 4137/20 4151/21 4154/1 4154/12 4158/19 4159/16 4160/16	4160/25 4165/17 4166/12 4167/25 4168/1 4171/21 4172/13 4172/13 4174/24 4176/1 4177/25 4181/12 4181/24 4182/3 4182/8 4185/2 4194/1 4201/10 4204/21 <b>one's [2]</b> 4120/21 4121/2 <b>ones [3]</b> 4108/20 4109/1 4110/9 <b>only [17]</b> 4093/18 4096/13 4107/5 4107/6 4147/7 4147/17 4152/3 4159/24 4161/15 4177/16 4177/20 4177/24 4183/18 4184/21 4196/7 4201/20 4201/21 <b>open [2]</b> 4127/4 4201/21 <b>operate [1]</b> 4154/20 <b>operationalizing [1]</b> 4202/13 <b>opportunities [2]</b> 4145/12 4175/2 <b>opportunity [2]</b> 4145/19 4175/6 <b>opposed [1]</b> 4107/18 <b>opposite [1]</b> 4142/13 <b>optimize [1]</b> 4152/4 <b>option [4]</b> 4102/9 4186/24 4201/10 4203/2 <b>optional [1]</b> 4199/10 <b>order [7]</b> 4122/10 4123/5 4130/16 4149/21 4160/4 4178/2 4178/9 <b>organization [1]</b> 4151/22 <b>organize [2]</b> 4130/24 4194/19 <b>organized [1]</b> 4145/7 <b>original [5]</b> 4141/12 4141/16 4157/11 4157/19 4162/16 <b>orthogonal [1]</b> 4153/17 <b>other [22]</b> 4094/4 4099/15 4106/16 4120/23 4133/7 4138/15 4141/17 4142/1 4145/1 4147/21 4148/16 4148/18 4148/19 4151/25 4155/13 4162/1 4163/2 4164/22 4187/17 4188/9 4203/22 4204/16 <b>others [2]</b> 4118/25 4184/24 <b>others' [1]</b> 4123/1 <b>otherwise [3]</b> 4113/13 4153/21 4155/19 <b>ought [1]</b> 4144/9	<b>our [22]</b> 4097/22 4101/6 4135/19 4135/25 4136/25 4137/23 4138/3 4138/14 4139/1 4139/9 4141/5 4144/4 4144/22 4152/17 4194/17 4195/21 4198/10 4198/11 4199/15 4199/24 4202/9 4202/11 <b>out [8]</b> 4100/9 4135/4 4141/24 4149/7 4151/25 4185/4 4191/18 4201/7 <b>outcome [5]</b> 4102/15 4108/1 4108/14 4186/23 4199/4 <b>output [1]</b> 4102/13 <b>outside [1]</b> 4165/8 <b>outsource [1]</b> 4151/22 <b>outstanding [1]</b> 4106/13 <b>over [31]</b> 4091/8 4091/11 4112/21 4112/24 4115/6 4125/11 4130/24 4131/3 4131/8 4132/1 4136/11 4136/17 4136/23 4137/7 4138/6 4138/23 4138/24 4139/17 4140/8 4140/14 4140/19 4152/10 4152/13 4153/6 4153/7 4154/9 4174/24 4188/13 4188/18 4197/5 4200/11 <b>overall [4]</b> 4103/2 4128/16 4140/7 4141/18 <b>overlapping [1]</b> 4090/6 <b>overloaded [1]</b> 4144/19 <b>overpromises [1]</b> 4115/14 <b>overwhelming [4]</b> 4130/18 4131/4 4133/4 4136/3 <b>own [2]</b> 4142/12 4202/18
	<b>O</b>		<b>P</b>	
<b>network [1]</b> 4134/16 <b>neutral [1]</b> 4196/23 <b>never [6]</b> 4091/2 4115/23 4118/23 4147/18 4161/18 4164/15 <b>new [12]</b> 4084/20 4085/9 4099/9 4106/12 4108/19 4108/25 4110/8 4139/7 4139/13 4170/23 4205/2 4205/4 <b>next [45]</b> 4094/3 4099/3 4099/4 4099/17 4101/4 4104/2 4112/12 4113/1 4113/24 4117/9 4119/8 4121/17 4121/17 4132/13 4133/19 4137/12 4143/4 4143/23 4144/14 4146/4 4146/10 4150/13 4152/13 4154/11 4155/5 4155/6 4157/14 4158/7 4158/18 4159/1 4159/3 4159/3 4160/24 4168/24 4169/2 4169/4 4170/19 4174/4 4178/2 4178/8 4188/22 4189/16 4189/22 4190/10 4190/25 <b>nice [3]</b> 4087/13 4141/21 4192/5 <b>night [2]</b> 4088/14 4091/10 <b>nitty [1]</b> 4178/15 <b>nitty-gritty [1]</b> 4178/15 <b>no [33]</b> 4083/4 4093/25 4101/10 4103/17 4103/20 4111/21 4111/23 4112/7 4112/8 4118/19 4119/11 4120/9 4120/20 4126/6 4136/5 4141/15 4143/6 4147/2 4150/25 4153/3 4156/3 4156/10 4165/10 4166/8 4166/21 4179/3 4179/9 4180/8 4183/10 4190/17 4191/8 4191/12 4203/7 <b>nomenclature [1]</b> 4100/18 <b>non [1]</b> 4108/12 <b>non-trivial [1]</b> 4108/12 <b>None [1]</b> 4191/20 <b>normal [2]</b> 4137/23 4139/7 <b>not [145]</b> <b>nota [1]</b> 4187/2 <b>nota bene [1]</b> 4187/2 <b>note [7]</b> 4130/13 4131/13 4147/17 4187/1 4187/3 4187/5 4187/6 <b>noted [3]</b> 4101/20 4118/18 4187/3 <b>notes [2]</b> 4133/6	<b>object [1]</b> 4158/3 <b>objection [6]</b> 4107/11 4155/1 4163/3 4163/23 4183/9 4183/10 <b>objective [7]</b> 4130/23 4131/2 4135/25 4140/19 4152/21 4153/16 4153/24 <b>observe [1]</b> 4198/8 <b>obvious [1]</b> 4194/14 <b>obviously [1]</b> 4147/18 <b>October [16]</b> 4083/5 4109/16 4109/22 4110/2 4126/9 4126/13 4126/19 4126/22 4128/7 4128/9 4128/13 4179/11 4179/12 4179/15 4181/23 4206/7 <b>October 14 [1]</b> 4179/12 <b>October 14th [1]</b> 4179/11 <b>October 15 [1]</b> 4126/22 <b>October 15th [4]</b> 4126/9 4126/13 4128/7 4128/13	<b>October 17 [1]</b> 4181/23 <b>odds [2]</b> 4110/22 4115/19 <b>off [4]</b> 4090/14 4096/25 4097/11 4190/22 <b>offered [1]</b> 4193/4 <b>Official [1]</b> 4085/12 <b>offset [2]</b> 4094/12 4094/25 <b>Oh [5]</b> 4111/24 4123/24 4126/22 4139/21 4186/8 <b>okay [78]</b> 4087/22 4089/13 4091/13 4092/3 4092/22 4093/14 4094/9 4094/23 4095/6 4095/10 4096/14 4098/7 4102/4 4104/16 4112/2 4112/5 4113/23 4119/19 4123/25 4124/2 4126/7 4126/21 4127/1 4127/2 4127/19 4128/5 4128/25 4131/22 4132/23 4134/3 4135/20 4135/23 4139/16 4140/21 4142/2 4143/7 4146/2 4148/6 4150/5 4150/16 4151/4 4154/5 4158/25 4163/10 4163/25 4168/22 4169/15 4169/25 4170/3 4171/7 4173/4 4174/3 4175/24 4179/14 4180/3 4180/19 4181/20 4182/16 4184/4 4184/13 4184/22 4185/4 4189/15 4190/19 4192/4 4192/16 4193/13 4196/25 4197/7 4197/18 4198/4 4198/17 4200/22 4202/15 4202/21 4203/9 4203/16 4204/14 <b>OKR [14]</b> 4130/19 4130/19 4130/22 4131/5 4134/7 4134/24 4135/25 4141/2 4146/1 4148/11 4148/20 4152/21 4153/2 4156/4 <b>old [2]</b> 4108/19 4197/11 <b>once [1]</b> 4203/11 <b>one [44]</b> 4088/24 4090/2 4094/5 4097/3 4104/7 4107/5 4107/6 4108/22 4112/21 4115/9 4117/19 4120/6 4125/5 4128/3 4128/7 4128/19 4131/8 4137/17 4137/20 4151/21 4154/1 4154/12 4158/19 4159/16 4160/16	<b>p.m [3]</b> 4201/20 4205/12 4205/12 <b>PA [1]</b> 4171/15 <b>page [60]</b> 4092/8 4092/17 4095/20 4096/5 4096/15 4096/18 4096/20 4097/16 4098/23 4104/1 4104/2 4104/8 4104/20 4109/8 4109/16 4109/22 4109/24 4112/12 4113/1 4113/24 4115/16 4116/14 4117/19 4119/8	

<b>P</b>	<b>particular [11]</b> 4089/2 4093/7 4093/17 4093/25 4107/25 4114/10 4133/12 4143/9 4167/7 4204/6 4204/12 <b>parties [3]</b> 4168/6 4194/1 4194/2 <b>partnership [1]</b> 4172/8 <b>parts [1]</b> 4148/23 <b>party [2]</b> 4151/22 4172/9 <b>pass [1]</b> 4191/18 <b>passed [1]</b> 4138/25 <b>past [6]</b> 4098/20 4134/6 4144/6 4152/13 4153/7 4200/11 <b>PATTERSON [1]</b> 4084/18 <b>pause [4]</b> 4191/16 4200/23 4202/16 4205/2 <b>pay [6]</b> 4097/23 4158/16 4186/10 4201/17 4203/6 4203/10 <b>paying [1]</b> 4124/19 <b>pbwt.com [1]</b> 4084/21 <b>PCQ [5]</b> 4096/8 4096/12 4096/15 4096/21 4144/5 <b>PCTR [8]</b> 4092/14 4117/25 4144/5 4178/16 4178/21 4178/25 4179/7 4179/20 <b>people [6]</b> 4142/1 4143/10 4143/16 4154/16 4154/19 4173/12 <b>per [29]</b> 4088/22 4097/23 4097/23 4097/23 4100/10 4100/15 4100/23 4100/23 4108/9 4130/4 4130/7 4130/19 4131/5 4138/19 4140/1 4140/11 4152/15 4153/8 4155/15 4156/2 4156/10 4157/8 4159/18 4172/20 4182/21 4199/9 4201/17 4203/7 4204/5 <b>percent [50]</b> 4103/22 4129/12 4129/19 4129/19 4129/21 4129/23 4130/19 4131/5 4133/21 4133/25 4134/7 4134/18 4134/20 4134/24 4135/1 4136/4 4138/19 4139/3 4139/3 4139/11 4139/12 4139/23 4139/25 4140/9 4140/17 4141/1 4141/5 4145/3 4145/3 4146/19 4147/4 4147/9 4147/13 4147/19	4148/11 4148/20 4149/4 4152/14 4152/21 4153/2 4153/8 4153/15 4153/21 4153/23 4154/3 4172/19 4173/20 4174/10 4182/21 4200/20 <b>percentage [4]</b> 4133/18 4135/14 4153/23 4153/25 <b>perception [1]</b> 4188/23 <b>performance [2]</b> 4150/14 4204/13 <b>perhaps [7]</b> 4099/15 4107/6 4132/14 4132/16 4171/21 4172/20 4187/2 <b>period [1]</b> 4136/11 <b>periods [1]</b> 4130/25 <b>permission [2]</b> 4163/1 4183/8 <b>permit [1]</b> 4147/7 <b>personalization [1]</b> 4170/25 <b>perspective [6]</b> 4100/18 4116/7 4135/2 4137/6 4193/23 4199/14 <b>Ph.D [2]</b> 4193/3 4193/15 <b>phenomena [1]</b> 4198/7 <b>physically [1]</b> 4202/7 <b>physics [1]</b> 4147/7 <b>pick [3]</b> 4088/15 4096/24 4202/17 <b>picked [2]</b> 4192/11 4192/11 <b>Pitch [1]</b> 4150/13 <b>place [4]</b> 4100/6 4102/21 4104/6 4193/21 <b>Plaintiff [2]</b> 4084/11 4087/10 <b>PLAINTIFF's [2]</b> 4086/5 4190/22 <b>Plaintiffs [4]</b> 4083/4 4084/2 4087/9 4088/7 <b>planet [1]</b> 4154/20 <b>PLAs [2]</b> 4132/2 4132/10 <b>platform [3]</b> 4130/1 4134/12 4135/15 <b>platforms [1]</b> 4148/18 <b>plausible [6]</b> 4106/4 4122/19 4160/23 4180/23 4181/10 4185/16 <b>play [4]</b> 4100/13 4196/2 4199/3 4200/3 <b>plays [1]</b> 4104/22 <b>please [21]</b> 4087/4 4107/15 4109/19 4113/24 4126/9 4135/8 4139/21 4148/25 4149/22 4150/11 4158/7 4160/14 4169/18 4175/21	4179/10 4183/25 4184/2 4187/4 4187/6 4201/19 4205/6 <b>PLQ [5]</b> 4096/8 4096/12 4096/15 4096/21 4144/5 <b>plus [3]</b> 4129/12 4131/13 4153/15 <b>PM [1]</b> 4151/11 <b>point [19]</b> 4098/20 4099/3 4119/18 4123/18 4124/12 4142/16 4146/4 4146/10 4147/24 4150/25 4153/24 4165/23 4167/6 4174/4 4174/6 4174/15 4174/18 4186/2 4193/16 <b>points [4]</b> 4116/22 4142/7 4144/25 4152/16 <b>Polyjuice [5]</b> 4180/22 4180/24 4181/4 4181/7 4183/13 <b>population [1]</b> 4195/11 <b>portions [2]</b> 4093/15 4113/9 <b>position [4]</b> 4117/8 4117/10 4186/3 4186/3 <b>positions [1]</b> 4177/1 <b>positive [7]</b> 4128/2 4128/21 4139/12 4140/4 4140/4 4140/17 4140/18 <b>positively [1]</b> 4145/14 <b>possessive [2]</b> 4114/22 4114/25 <b>possible [7]</b> 4106/15 4114/11 4128/21 4129/14 4146/18 4178/14 4193/23 <b>possibly [1]</b> 4199/11 <b>posting [1]</b> 4154/16 <b>postlaunch [2]</b> 4139/13 4139/13 <b>potential [1]</b> 4204/18 <b>potentially [3]</b> 4124/15 4133/6 4159/17 <b>potion [1]</b> 4181/4 <b>potions [1]</b> 4181/11 <b>Potter [3]</b> 4180/25 4181/4 4181/7 <b>practice [7]</b> 4134/17 4137/10 4143/14 4143/17 4148/4 4153/19 4202/10 <b>predicate [1]</b> 4166/24 <b>predict [9]</b> 4093/6 4093/24 4144/5 4199/15 4199/16 4199/16 4199/22 4199/24 4200/6 <b>predicted [9]</b> 4094/5 4094/11 4094/12 4094/25 4095/1 4095/23 4095/24 4196/19 4196/23	<b>predicting [1]</b> 4145/9 <b>prediction [8]</b> 4143/23 4144/3 4144/23 4144/23 4145/16 4172/24 4173/2 4199/19 <b>prelaunch [1]</b> 4139/14 <b>prepared [1]</b> 4167/19 <b>present [1]</b> 4120/9 <b>presentation [3]</b> 4112/6 4160/20 4168/8 <b>president [1]</b> 4192/14 <b>presiding [1]</b> 4087/3 <b>pressure [2]</b> 4120/6 4120/16 <b>presumably [4]</b> 4098/3 4099/6 4119/25 4165/23 <b>Prettyman [1]</b> 4085/13 <b>previous [5]</b> 4106/16 4108/25 4110/8 4136/18 4189/11 <b>previously [3]</b> 4088/8 4103/12 4109/2 <b>price [16]</b> 4101/15 4101/18 4101/19 4102/17 4102/25 4106/25 4116/20 4118/12 4119/23 4121/9 4122/8 4124/19 4126/4 4175/14 4182/17 4184/7 <b>priced [1]</b> 4091/21 <b>prices [38]</b> 4102/15 4103/2 4103/15 4105/3 4105/3 4105/6 4105/25 4106/9 4107/9 4107/18 4107/21 4108/2 4108/3 4108/8 4108/19 4108/19 4108/23 4108/24 4108/25 4109/4 4110/5 4110/7 4110/7 4110/8 4110/8 4113/2 4121/8 4125/15 4125/19 4126/5 4127/11 4127/15 4127/21 4146/6 4188/12 4188/18 4200/13 4200/14 <b>pricing [84]</b> 4097/2 4097/4 4097/8 4097/12 4097/17 4097/22 4097/24 4098/6 4099/19 4100/3 4101/5 4101/7 4101/8 4101/14 4101/17 4102/9 4102/19 4103/11 4103/14 4103/16 4103/19 4108/6 4111/16 4112/9 4113/6 4114/9 4114/14 4116/12 4118/16 4119/2 4119/11 4119/15 4119/22 4120/1 4120/18 4120/24 4121/5 4121/5 4121/12 4121/14 4121/21 4121/22
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<b>P</b>	<b>Professor Whinston's</b>	4203/13	4190/7 4190/8 4195/2 4203/18	<b>rate [6]</b> 4173/12 4199/15 4199/16 4199/22 4199/24 4200/7	
<b>pricing...</b> [42] 4121/25 4122/1 4122/2 4122/5 4122/9 4122/10 4122/12 4122/16 4122/20 4122/21 4122/22 4123/4 4123/5 4123/6 4124/5 4124/9 4124/17 4125/7 4125/10 4125/12 4125/23 4126/1 4126/3 4127/9 4127/20 4128/1 4128/16 4144/14 4146/4 4152/5 4152/16 4157/9 4157/10 4177/9 4177/11 4185/11 4186/13 4186/16 4186/19 4186/21 4199/13 4204/18	<b>[1]</b> 4087/19 <b>profit [1]</b> 4112/15 <b>profits [1]</b> 4112/18 <b>program [2]</b> 4168/24 4173/6 <b>progress [2]</b> 4131/1 4135/24 <b>project [13]</b> 4127/20 4128/16 4151/11 4155/12 4155/12 4155/23 4155/24 4156/1 4156/8 4156/9 4157/20 4157/23 4160/20 <b>prolific [1]</b> 4154/12 <b>promotion [4]</b> 4150/18 4151/5 4151/7 4159/22 <b>propensity [3]</b> 4196/10 4196/11 4196/13 <b>proper [1]</b> 4110/19 <b>properties [1]</b> 4160/10 <b>proposal [31]</b> 4158/20 4158/22 4159/11 4160/9 4161/5 4161/8 4161/10 4161/14 4161/18 4161/22 4162/7 4162/7 4162/15 4163/15 4165/16 4165/25 4166/3 4166/6 4166/17 4167/23 4168/16 4169/16 4170/5 4170/16 4170/21 4171/8 4171/8 4172/1 4172/5 4173/13 4173/14 <b>proposals [1]</b> 4164/15 <b>propose [1]</b> 4166/9 <b>proposed [6]</b> 4163/16 4164/21 4174/20 4175/1 4190/15 4190/15 <b>proposing [1]</b> 4170/8 <b>prose [1]</b> 4123/2 <b>Protection [1]</b> 4084/13 <b>proven [1]</b> 4142/23 <b>provide [11]</b> 4115/25 4145/11 4151/21 4159/14 4201/22 4203/20 4204/2 4204/11 4204/16 4204/17 4204/23 <b>provided [3]</b> 4098/14 4179/25 4204/4 <b>providing [7]</b> 4091/7 4098/12 4173/25 4180/1 4199/6 4199/6 4199/8 <b>pseudonymous [1]</b> 4170/24 <b>public [1]</b> 4092/23 <b>publicly [1]</b> 4167/20 <b>pull [2]</b> 4185/3 4187/23 <b>pulled [1]</b> 4091/9 <b>put [8]</b> 4087/17 4114/22 4132/6 4141/21 4143/21 4197/12 4200/11	<b>Q</b> <b>quality [88]</b> 4089/1 4089/3 4089/4 4089/7 4089/10 4089/11 4089/15 4089/15 4089/19 4089/19 4089/20 4089/24 4090/10 4097/4 4097/11 4099/5 4099/7 4099/9 4099/22 4100/2 4100/24 4101/14 4101/17 4101/18 4102/7 4102/8 4102/22 4102/24 4106/13 4106/19 4106/20 4106/24 4107/1 4110/4 4111/21 4112/7 4114/20 4114/23 4116/2 4116/5 4120/10 4121/1 4125/15 4129/11 4129/17 4129/20 4131/6 4133/20 4133/24 4134/25 4136/3 4136/19 4144/5 4144/9 4144/10 4144/21 4144/23 4145/7 4145/9 4145/19 4145/21 4145/22 4151/12 4152/5 4154/13 4155/13 4156/25 4176/6 4180/21 4181/17 4182/8 4182/14 4194/3 4194/4 4194/16 4194/24 4195/4 4195/7 4195/13 4196/3 4196/9 4196/18 4199/7 4200/5 4200/13 4200/14 4200/19 4204/8 <b>queries [2]</b> 4143/21 4151/24 <b>query [3]</b> 4132/17 4147/5 4201/6 <b>question [55]</b> 4089/18 4090/20 4091/14 4091/15 4091/16 4095/18 4098/2 4106/22 4107/13 4108/12 4108/17 4110/3 4110/4 4110/10 4115/2 4115/4 4116/4 4118/3 4118/10 4118/13 4123/22 4125/8 4125/9 4126/17 4127/3 4127/5 4127/8 4127/24 4128/15 4130/21 4134/22 4135/8 4135/19 4141/7 4142/12 4149/2 4149/25 4150/1 4155/3 4156/23 4163/5 4164/1 4178/18 4179/5 4179/16 4179/17 4179/22 4179/24 4181/14 4183/4 4184/5	<b>questions [13]</b> 4103/6 4140/25 4151/10 4158/3 4161/1 4166/21 4191/8 4191/12 4197/20 4197/25 4198/20 4200/12 4200/18 <b>quick [2]</b> 4094/8 4123/8 <b>quickly [2]</b> 4195/9 4197/15 <b>quite [1]</b> 4106/15 <b>quo [1]</b> 4138/4 <b>quotes [1]</b> 4200/11	<b>R</b> <b>raise [12]</b> 4103/15 4107/9 4107/17 4107/20 4108/19 4108/23 4109/3 4110/5 4128/16 4128/19 4188/12 4188/18 <b>raised [2]</b> 4127/21 4197/9 <b>raising [2]</b> 4105/3 4110/6 <b>Ralph [1]</b> 4084/14 <b>ramification [1]</b> 4186/23 <b>ramifications [2]</b> 4116/1 4171/15 <b>ran [2]</b> 4135/5 4173/5 <b>randomization [4]</b> 4184/15 4184/19 4185/10 4185/14 <b>randomize' [1]</b> 4188/23 <b>randomized [1]</b> 4175/13 <b>randomly [2]</b> 4189/16 4190/5 <b>ranges [1]</b> 4194/8 <b>ranging [1]</b> 4201/14 <b>rank [7]</b> 4090/3 4090/11 4117/8 4117/10 4186/3 4186/12 4189/25 <b>ranked [3]</b> 4090/2 4091/21 4189/6 <b>ranking [7]</b> 4089/16 4102/22 4113/6 4155/14 4179/7 4179/20 4199/13 <b>ranking/pricing [1]</b> 4113/6 <b>rare [1]</b> 4100/8 <b>Rasta [23]</b> 4129/12 4129/25 4130/1 4134/8 4134/11 4134/18 4135/2 4135/3 4135/12 4135/15 4136/1 4136/6 4136/7 4136/9 4136/20 4137/8 4137/15 4137/17 4139/11 4153/15 4155/18 4197/20 4197/25	<b>rather [13]</b> 4103/22 4106/18 4108/15 4116/4 4119/4 4125/5 4153/22 4155/18 4157/4 4157/25 4173/17 4173/25 4175/15 <b>re [4]</b> 4126/2 4126/17 4127/3 4184/5 <b>re-ask [3]</b> 4126/17 4127/3 4184/5 <b>re-start [1]</b> 4126/2 <b>reach [3]</b> 4147/13 4147/24 4148/11 <b>reaching [1]</b> 4147/12 <b>read [27]</b> 4092/18 4095/23 4096/18 4119/17 4123/13 4126/11 4126/12 4126/15 4126/25 4127/1 4128/7 4130/10 4131/25 4131/25 4132/13 4145/17 4148/22 4148/25 4152/25 4161/9 4163/19 4170/23 4181/2 4181/8 4183/8 4183/25 4190/18 <b>reading [6]</b> 4104/14 4110/15 4122/16 4123/19 4126/24 4165/20 <b>ready [4]</b> 4087/14 4088/4 4094/7 4094/9 <b>real [5]</b> 4094/8 4123/8 4134/19 4138/22 4146/17 <b>real-time [1]</b> 4138/22 <b>reality [1]</b> 4104/23 <b>realized [1]</b> 4156/5 <b>really [1]</b> 4166/21 <b>Realtime [1]</b> 4085/12 <b>reason [5]</b> 4093/1 4143/18 4148/20 4149/3 4164/20 <b>reasonable [2]</b> 4091/12 4111/15 <b>recall [15]</b> 4093/12 4093/17 4096/9 4098/11 4098/12 4112/6 4152/10 4152/12 4160/22 4178/4 4178/5 4178/6 4197/19 4197/22 4198/21 <b>recap [1]</b> 4116/17 <b>receive [1]</b> 4151/5 <b>received [1]</b> 4193/9 <b>recent [1]</b> 4193/2 <b>recess [4]</b> 4149/18 4149/19 4205/11 4205/12 <b>recognition [1]</b> 4140/13

<b>R</b>	4133/18 4139/2 4158/15 4168/20 <b>relevant [3]</b> 4143/11 4185/21 4185/25 <b>rely [1]</b> 4131/8 <b>remember [9]</b> 4090/23 4092/15 4093/18 4093/20 4097/5 4129/9 4129/10 4181/12 4195/25 <b>remove [1]</b> 4133/19 <b>repeat [7]</b> 4109/18 4118/13 4156/23 4175/21 4178/18 4192/12 4195/2 <b>replace [1]</b> 4185/11 <b>report [3]</b> 4150/24 4151/1 4153/20 <b>reported [1]</b> 4156/5 <b>Reporter [4]</b> 4085/11 4085/11 4085/12 4085/12 <b>reporting [1]</b> 4100/19 <b>reports [1]</b> 4204/20 <b>represent [2]</b> 4133/4 4133/16 <b>request [1]</b> 4163/1 <b>reserve [3]</b> 4121/5 4121/8 4121/12 <b>reserves [1]</b> 4101/7 <b>respect [4]</b> 4091/16 4096/10 4141/22 4153/22 <b>respectively [1]</b> 4166/25 <b>respond [4]</b> 4136/17 4138/23 4138/24 4198/10 <b>response [13]</b> 4091/8 4117/17 4125/9 4136/22 4137/3 4137/4 4137/5 4139/7 4143/20 4147/4 4151/23 4161/22 4194/7 <b>responses [1]</b> 4139/19 <b>rest [3]</b> 4109/4 4131/11 4136/12 <b>restate [4]</b> 4089/10 4107/13 4130/21 4163/25 <b>rested [1]</b> 4131/5 <b>restricted [1]</b> 4094/16 <b>result [6]</b> 4102/24 4139/25 4140/14 4152/21 4182/17 4195/10 <b>resulted [2]</b> 4182/20 4184/7 <b>results [2]</b> 4130/24 4202/9 <b>resume [1]</b> 4149/14 <b>RESUMED [1]</b> 4088/8 <b>retained [1]</b> 4170/6 <b>returning [2]</b> 4103/8 4127/13 <b>rev [1]</b> 4196/20 <b>revenue [56]</b> 4111/7 4115/10 4115/18	4124/20 4129/20 4130/4 4130/7 4130/19 4131/5 4131/18 4132/25 4132/25 4133/5 4135/14 4136/4 4136/5 4136/6 4136/15 4136/21 4136/23 4137/1 4137/10 4138/7 4138/9 4138/19 4139/25 4140/14 4141/20 4143/25 4145/25 4148/20 4149/4 4152/14 4153/1 4153/5 4153/8 4153/12 4153/12 4153/18 4153/20 4154/4 4154/9 4155/19 4156/5 4157/8 4159/18 4159/24 4160/4 4174/22 4175/2 4196/20 4196/23 4197/4 4198/1 4200/4 4200/20 <b>review [2]</b> 4176/7 4187/25 <b>reviewed [1]</b> 4098/9 <b>reviewers [1]</b> 4154/12 <b>reviewing [1]</b> 4132/1 <b>rewind [1]</b> 4088/16 <b>rGSP [41]</b> 4175/11 4175/13 4176/4 4176/9 4176/12 4176/21 4176/25 4177/12 4177/16 4177/20 4178/3 4178/10 4178/16 4178/20 4179/1 4179/3 4179/6 4179/17 4179/18 4179/19 4180/6 4180/11 4180/14 4180/21 4181/13 4181/15 4181/16 4182/12 4182/14 4182/17 4182/20 4183/13 4184/7 4184/11 4184/20 4184/24 4184/25 4185/15 4185/18 4188/17 4190/11 <b>right [40]</b> 4087/12 4087/25 4088/3 4092/13 4098/4 4100/10 4104/6 4105/23 4115/11 4119/24 4120/17 4129/5 4130/15 4134/20 4134/25 4138/5 4140/10 4140/18 4141/6 4146/6 4147/10 4148/2 4148/13 4150/20 4155/24 4159/25 4160/17 4165/1 4166/4 4166/14 4167/23 4171/11 4174/5 4176/11 4179/4 4183/11 4184/10 4190/6 4191/10 4204/16	<b>right-hand [1]</b> 4167/23 <b>rise [6]</b> 4087/2 4139/25 4149/17 4149/20 4167/15 4205/10 <b>risk [3]</b> 4125/18 4127/14 4146/17 <b>RMR [2]</b> 4206/2 4206/8 <b>role [1]</b> 4192/12 <b>roles [2]</b> 4199/2 4200/3 <b>Roman [1]</b> 4113/25 <b>ROSATI [1]</b> 4085/7 <b>rough [2]</b> 4141/17 4204/5 <b>roughly [1]</b> 4182/21 <b>round [1]</b> 4099/18 <b>RPM [28]</b> 4129/12 4129/25 4130/4 4130/6 4134/8 4134/8 4135/2 4135/12 4135/13 4135/16 4136/1 4136/6 4136/8 4136/9 4136/11 4137/8 4137/15 4138/11 4138/12 4139/11 4142/11 4145/14 4146/1 4153/15 4155/18 4156/4 4197/21 4198/1 <b>rudimentary [1]</b> 4092/19 <b>ruling [1]</b> 4164/2 <b>run [11]</b> 4093/2 4106/3 4116/5 4130/1 4134/12 4134/15 4135/3 4137/21 4140/14 4167/25 4189/4 <b>runner [2]</b> 4143/5 4186/11 <b>runner-up [1]</b> 4143/5 <b>runner-up' [1]</b> 4186/11 <b>running [4]</b> 4138/18 4139/1 4176/12 4180/11 <b>runs [4]</b> 4116/20 4117/15 4189/24 4203/11	<b>save [8]</b> 4168/1 4168/9 4169/2 4169/5 4169/7 4169/11 4170/9 4170/10 <b>saved [2]</b> 4168/17 4170/17 <b>saving [3]</b> 4169/13 4169/13 4170/13 <b>saw [1]</b> 4089/20 <b>say [34]</b> 4095/24 4096/1 4101/3 4105/1 4105/17 4106/4 4115/21 4119/9 4122/19 4122/24 4130/17 4135/6 4147/12 4151/11 4155/18 4162/24 4164/8 4168/19 4169/22 4173/22 4174/4 4178/13 4178/13 4181/8 4186/10 4186/11 4188/21 4189/4 4189/16 4190/1 4190/3 4190/3 4201/19 4202/6 <b>saying [18]</b> 4093/18 4100/1 4101/1 4102/18 4121/16 4131/19 4133/24 4142/12 4146/24 4147/2 4147/6 4147/14 4147/15 4152/12 4153/22 4166/5 4189/14 4190/1 <b>says [24]</b> 4093/5 4093/9 4097/17 4107/8 4113/5 4115/15 4119/22 4121/4 4121/8 4121/17 4125/14 4127/18 4156/11 4168/12 4168/13 4169/2 4169/16 4170/7 4170/10 4170/11 4171/16 4176/18 4177/8 4186/6 <b>scale [1]</b> 4160/4 <b>scenario [1]</b> 4120/7 <b>scenarios [3]</b> 4120/2 4120/5 4173/3 <b>Schmidlein [2]</b> 4085/2 4087/11 <b>School [3]</b> 4193/4 4193/4 4193/7 <b>science [5]</b> 4193/6 4193/7 4193/8 4193/10 4193/22 <b>Sciences [2]</b> 4193/5 4193/8 <b>scope [1]</b> 4094/17 <b>score [7]</b> 4089/19 4089/19 4089/23 4117/5 4117/6 4117/16 4117/16 <b>scores [3]</b> 4176/22 4177/4 4177/20 <b>screen [8]</b> 4092/13 4092/25 4093/1 4103/9 4183/3 4188/10 4191/19 4197/12
		<b>S</b>		
		<b>safer [3]</b> 4105/3 4107/9 4107/17 <b>said [16]</b> 4090/24 4106/7 4108/21 4109/5 4109/25 4125/2 4126/18 4127/12 4131/1 4131/13 4154/7 4177/6 4188/5 4189/11 4194/11 4198/19 <b>sale [1]</b> 4100/23 <b>sales [2]</b> 4100/19 4100/22 <b>Sallet [1]</b> 4084/12 <b>same [15]</b> 4092/19 4096/15 4121/2 4125/6 4127/15 4142/5 4153/15 4159/2 4166/18 4171/23 4180/13 4180/17 4181/21 4183/7 4184/11		

<b>S</b>	4142/14 4142/25 4144/1 4144/24 4149/23 4151/14 4152/7 4152/18 4154/22 4155/9 4156/16 4157/16 4157/21 4158/10 4159/9 4159/19 4159/20 4160/1 4161/5 4161/6 4165/16 4168/14 4169/3 4170/9 4170/14 4170/15 4170/18 4170/24 4171/3 4172/15 4172/21 4174/12 4176/4 4176/19 4177/14 4181/16 4181/18 4181/25 4182/10 4182/13 4183/15 4183/19 4183/23 4184/17 4185/1 4185/12 4185/23 4185/24 4186/4 4186/14 4187/12 4187/20 4187/24 4188/2 4188/15 4188/16 4188/25 4189/8 4189/19 4192/5 4194/25 4195/5 4197/3 4197/4 4198/15 4200/25 4205/8 <b>seeing [3]</b> 4116/6 4194/7 4194/11 <b>seek [2]</b> 4093/6 4093/23 <b>seeking [1]</b> 4159/21 <b>seem [1]</b> 4165/4 <b>seemingly [1]</b> 4146/17 <b>seems [9]</b> 4094/1 4113/14 4124/21 4133/8 4160/22 4167/5 4176/11 4180/23 4198/15 <b>seen [2]</b> 4148/24 4182/9 <b>sees [1]</b> 4195/8 <b>select [1]</b> 4161/24 <b>selection [1]</b> 4199/20 <b>sell [2]</b> 4195/16 4195/20 <b>selling [4]</b> 4177/12 4177/13 4177/16 4177/17 <b>semiannually [1]</b> 4140/16 <b>send [1]</b> 4151/25 <b>sending [2]</b> 4162/16 4195/15 <b>sense [1]</b> 4204/23 <b>sensitive [1]</b> 4164/23 <b>sentence [22]</b> 4094/8 4094/10 4099/14 4099/17 4099/21 4101/4 4101/12 4109/5 4121/16 4122/3 4132/2 4132/13 4133/19 4135/11 4135/22	4144/7 4145/17 4155/11 4157/6 4183/21 4183/22 4185/7 <b>sentences [1]</b> 4101/9 <b>SERP [2]</b> 4117/17 4177/1 <b>serve [3]</b> 4175/2 4175/4 4175/6 <b>server [3]</b> 4160/10 4161/15 4169/22 <b>service [2]</b> 4143/12 4152/1 <b>services [3]</b> 4151/21 4195/16 4195/20 <b>serving [1]</b> 4152/4 <b>session [2]</b> 4083/7 4149/21 <b>set [10]</b> 4114/10 4121/13 4142/20 4143/10 4143/13 4167/7 4194/1 4194/2 4202/23 4203/4 <b>settle [2]</b> 4091/8 4139/10 <b>setup [2]</b> 4090/12 4137/24 <b>several [4]</b> 4155/15 4156/2 4156/9 4157/7 <b>share [2]</b> 4153/24 4161/6 <b>shares [1]</b> 4171/24 <b>shelf [1]</b> 4109/10 <b>shift [1]</b> 4188/12 <b>Shiv [3]</b> 4151/2 4182/5 4182/7 <b>Shivakumar [1]</b> 4151/2 <b>shopping [3]</b> 4132/10 4133/1 4151/13 <b>short [9]</b> 4136/25 4136/25 4137/18 4137/19 4171/16 4171/22 4196/8 4196/20 4200/4 <b>short-term [5]</b> 4136/25 4137/18 4196/8 4196/20 4200/4 <b>should [21]</b> 4091/17 4097/11 4108/4 4111/18 4124/18 4126/5 4127/11 4129/2 4130/15 4140/16 4145/20 4145/21 4160/15 4164/5 4175/17 4187/11 4195/10 4195/18 4197/5 4198/14 4201/25 <b>shoulders [2]</b> 4131/6 4141/19 <b>show [12]</b> 4124/1 4136/21 4145/23 4183/3 4188/5 4191/19 4194/9 4194/10 4194/13 4201/16 4201/20 4201/24 <b>showing [11]</b> 4093/6 4093/24 4094/12	4144/9 4144/10 4145/20 4145/20 4145/21 4148/1 4195/13 4201/6 <b>shown [1]</b> 4167/14 <b>shows [1]</b> 4131/11 <b>shy [1]</b> 4149/10 <b>sibling [1]</b> 4152/17 <b>side [7]</b> 4161/15 4165/18 4167/13 4167/23 4171/4 4195/12 4200/2 <b>sightedness [2]</b> 4195/24 4196/14 <b>signals [4]</b> 4096/13 4155/13 4199/7 4199/14 <b>significant [2]</b> 4093/15 4174/16 <b>significantly [3]</b> 4161/11 4174/14 4174/21 <b>similar [1]</b> 4172/6 <b>simple [1]</b> 4179/5 <b>simplified [8]</b> 4094/15 4094/18 4095/19 4096/22 4118/20 4119/4 4119/6 4178/24 <b>simplify [1]</b> 4176/16 <b>simply [1]</b> 4143/21 <b>simulation [1]</b> 4201/1 <b>since [2]</b> 4157/7 4157/10 <b>single [2]</b> 4137/22 4181/9 <b>sir [19]</b> 4108/16 4109/9 4110/2 4110/10 4127/8 4128/13 4128/24 4146/13 4155/20 4157/23 4158/7 4160/19 4163/12 4167/22 4169/10 4175/9 4179/15 4182/25 4190/24 <b>size [1]</b> 4202/3 <b>skeletons [3]</b> 4158/9 4158/13 4171/21 <b>skip [1]</b> 4112/3 <b>skipping [1]</b> 4175/25 <b>slide [16]</b> 4116/18 4118/6 4123/12 4125/13 4127/18 4163/19 4166/22 4167/13 4167/19 4168/10 4168/19 4170/11 4172/13 4173/24 4176/17 4176/19 <b>slides [1]</b> 4119/18 <b>small [6]</b> 4097/25 4133/16 4187/18 4188/13 4188/18 4202/2 <b>smaller [3]</b> 4135/25 4143/13 4202/9 <b>smarties [2]</b> 4111/21 4112/7 <b>Smurzynski [1]</b> 4085/2	<b>so [207]</b> <b>so I think [6]</b> 4092/24 4094/15 4095/4 4107/19 4166/13 4194/5 <b>so it's [11]</b> 4091/1 4095/13 4136/25 4139/3 4144/19 4155/17 4162/12 4169/25 4187/18 4202/6 4204/1 <b>so this document [1]</b> 4123/5 <b>So this is [1]</b> 4173/11 <b>so this isn't [1]</b> 4153/19 <b>So this percentage [1]</b> 4153/25 <b>solely [2]</b> 4141/19 4168/7 <b>solution [1]</b> 4141/24 <b>some [70]</b> 4091/4 4093/1 4095/2 4095/4 4096/11 4098/12 4099/10 4099/14 4099/15 4100/2 4100/3 4100/25 4101/15 4102/7 4102/25 4103/5 4103/5 4103/24 4113/13 4115/18 4116/1 4116/2 4116/22 4119/17 4120/22 4124/20 4133/7 4139/18 4140/3 4140/13 4140/15 4141/4 4146/18 4147/12 4147/21 4148/4 4148/9 4149/5 4151/9 4155/7 4155/7 4159/14 4161/1 4170/24 4170/25 4171/24 4174/16 4184/1 4184/24 4185/21 4185/25 4186/8 4187/17 4187/20 4188/9 4191/18 4192/10 4197/15 4197/24 4198/20 4198/23 4200/4 4201/2 4202/9 4202/11 4204/2 4204/4 4204/11 4204/18 4204/23 <b>somebody [1]</b> 4182/4 <b>someone [4]</b> 4136/18 4158/16 4181/5 4181/5 <b>something [13]</b> 4087/16 4100/15 4122/3 4125/4 4130/6 4136/20 4167/15 4169/23 4172/3 4188/5 4198/16 4198/18 4201/19 <b>sometimes [3]</b> 4110/4 4123/3 4137/21 <b>somewhat [3]</b> 4125/24 4125/25 4153/17 <b>SONSINI [1]</b> 4085/7
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<b>S</b>	4175/20 4176/2 4182/3 <b>stamp 4064 [1]</b> 4182/3 <b>stamp 4420 [1]</b> 4164/13 <b>STAND [1]</b> 4088/8 <b>standalone [2]</b> 4153/5 4171/10 <b>stands [11]</b> 4090/19 4099/5 4100/15 4130/6 4130/23 4149/17 4175/13 4176/6 4186/7 4186/9 4205/10 <b>start [17]</b> 4088/20 4092/11 4126/2 4131/3 4136/22 4141/2 4161/3 4166/23 4192/10 4192/24 4201/7 4201/9 4202/17 4202/18 4202/24 4205/1 4205/5 <b>started [1]</b> 4191/18 <b>starting [2]</b> 4094/19 4141/17 <b>starts [4]</b> 4094/5 4160/18 4172/13 4183/22 <b>state [20]</b> 4084/12 4090/21 4090/25 4091/3 4091/10 4104/22 4112/23 4115/6 4136/10 4142/22 4143/24 4146/5 4152/4 4154/18 4155/23 4157/18 4159/7 4170/2 4190/7 4196/6 <b>stated [10]</b> 4096/3 4113/22 4146/15 4152/9 4153/6 4156/8 4168/8 4172/18 4173/20 4177/4 <b>statement [65]</b> 4093/8 4093/22 4093/23 4094/14 4098/1 4099/12 4100/1 4104/24 4105/7 4105/9 4105/10 4107/8 4107/24 4113/17 4114/1 4114/5 4115/4 4117/22 4118/1 4120/3 4120/11 4120/12 4121/10 4121/17 4124/10 4124/14 4124/22 4125/20 4126/6 4128/22 4132/4 4132/18 4132/20 4132/21 4133/22 4134/6 4134/9 4142/25 4144/1 4144/12 4146/8 4146/21 4151/14 4152/13 4153/20 4154/14 4154/22 4155/16 4157/12 4157/21 4159/9 4159/19 4159/20 4160/1 4174/12 4176/23 4177/14 4185/12 4186/4 4186/14 4189/4 4189/8	4189/10 4189/16 4190/6 <b>states [27]</b> 4083/1 4083/3 4083/10 4084/6 4087/7 4087/10 4087/24 4094/10 4097/21 4099/4 4113/2 4114/3 4120/9 4121/21 4125/18 4133/19 4154/11 4155/12 4157/7 4164/4 4177/3 4185/8 4185/25 4186/10 4188/11 4188/22 4191/11 <b>stating [1]</b> 4147/3 <b>statistics [1]</b> 4106/3 <b>status [1]</b> 4138/4 <b>stay [4]</b> 4104/1 4123/3 4185/20 4188/23 <b>staying [3]</b> 4155/6 4202/22 4203/3 <b>steady [8]</b> 4090/21 4090/25 4091/2 4091/10 4112/23 4115/6 4136/10 4196/6 <b>steady-state [1]</b> 4196/6 <b>steeper [1]</b> 4188/13 <b>stenography [1]</b> 4085/15 <b>step [5]</b> 4088/16 4090/3 4099/22 4105/13 4180/4 <b>steward [2]</b> 4158/17 4158/17 <b>stewards [1]</b> 4144/22 <b>Sticking [1]</b> 4184/11 <b>still [13]</b> 4091/18 4125/25 4134/7 4142/22 4155/18 4155/19 4172/10 4174/17 4176/12 4180/11 4180/17 4198/7 4198/7 <b>stop [5]</b> 4094/13 4115/21 4115/22 4136/19 4145/20 <b>story [1]</b> 4189/7 <b>straightforward [1]</b> 4101/11 <b>strategic [1]</b> 4097/17 <b>strategy [2]</b> 4129/13 4131/7 <b>straw [1]</b> 4171/22 <b>straw' [1]</b> 4171/16 <b>street [4]</b> 4084/3 4084/8 4153/21 4156/5 <b>strike [6]</b> 4095/18 4108/16 4118/3 4118/10 4179/17 4181/14 <b>strong [1]</b> 4136/13 <b>structural [4]</b> 4131/23 4134/4 4148/9 4148/10 <b>structurally [1]</b> 4131/7 <b>studies [1]</b> 4193/16 <b>study [2]</b> 4193/16 4193/19	<b>studying [1]</b> 4193/24 <b>sub [1]</b> 4120/15 <b>sub-bullet [1]</b> 4120/15 <b>subject [1]</b> 4136/11 <b>submit [3]</b> 4088/20 4088/24 4166/25 <b>submitted [1]</b> 4091/19 <b>subsequently [3]</b> 4115/21 4155/14 4156/1 <b>subset [2]</b> 4179/7 4179/20 <b>substance [1]</b> 4197/24 <b>subtitle [1]</b> 4124/8 <b>subtraction [1]</b> 4200/8 <b>such [8]</b> 4106/13 4148/24 4153/20 4158/17 4180/10 4191/5 4200/3 4201/14 <b>sufficiency [2]</b> 4120/22 4121/3 <b>sufficient [7]</b> 4119/12 4119/13 4119/16 4120/19 4120/25 4121/5 4121/14 <b>suggesting [1]</b> 4145/2 <b>Suite [3]</b> 4084/8 4084/15 4084/20 <b>sum [6]</b> 4127/25 4128/20 4133/8 4140/5 4140/9 4197/24 <b>summa [1]</b> 4193/12 <b>summary [7]</b> 4130/13 4130/15 4130/17 4131/10 4172/13 4172/13 4181/23 <b>summation [2]</b> 4128/1 4128/21 <b>superior [1]</b> 4106/25 <b>supervisor [1]</b> 4150/17 <b>supported [1]</b> 4189/23 <b>sure [54]</b> 4089/5 4093/17 4098/16 4098/24 4100/7 4101/2 4101/20 4102/6 4104/5 4104/15 4109/11 4111/3 4111/24 4114/24 4115/8 4119/17 4120/13 4121/16 4123/1 4123/11 4123/14 4123/21 4123/23 4127/6 4141/11 4141/21 4144/17 4146/23 4147/14 4148/3 4154/16 4158/22 4160/11 4161/17 4162/22 4165/13 4167/2 4169/13 4170/7 4171/2 4175/5 4178/11 4180/5 4181/18 4182/15 4184/21 4186/20 4188/3 4190/12 4190/21 4192/22 4193/1 4199/1 4203/25 <b>surely [2]</b> 4139/5 4153/21	<b>surmise [1]</b> 4174/23 <b>surplus [1]</b> 4092/4 <b>suspect [1]</b> 4172/3 <b>sustainable [2]</b> 4204/10 4204/10 <b>SW [1]</b> 4085/3 <b>swapped [2]</b> 4177/5 4177/22 <b>swapping [5]</b> 4176/22 4177/20 4177/24 4178/3 4178/9 <b>switch [1]</b> 4191/15 <b>switched [1]</b> 4177/1 <b>SWORN [1]</b> 4088/8 <b>syndication [2]</b> 4151/19 4151/20 <b>system [5]</b> 4118/19 4137/5 4137/11 4158/14 4201/14 <b>system's [1]</b> 4091/1 4121/3 <b>systemically [2]</b> 4107/20 4109/3 <b>systems [4]</b> 4090/9 4144/4 4199/24 4200/6
			<b>T</b>	
			<b>table [2]</b> 4170/7 4203/15 <b>tails [2]</b> 4137/23 4138/8 <b>take [20]</b> 4088/16 4089/1 4090/2 4105/13 4109/6 4111/4 4115/12 4116/6 4128/19 4129/2 4140/5 4148/25 4149/11 4149/13 4180/4 4187/25 4189/15 4191/14 4196/15 4205/5 <b>taken [1]</b> 4201/25 <b>takes [1]</b> 4136/14 <b>taking [3]</b> 4099/22 4145/23 4173/15 <b>talk [7]</b> 4090/16 4096/16 4097/1 4103/3 4125/7 4185/1 4187/21 <b>talked [14]</b> 4090/3 4090/7 4090/17 4093/16 4097/2 4101/13 4110/23 4112/22 4117/14 4122/22 4132/10 4134/11 4152/9 4172/4 <b>talking [10]</b> 4090/21 4107/3 4156/21 4166/3 4167/12 4171/20 4183/7 4184/24 4184/25 4202/5 <b>target [1]</b> 4139/12 <b>targeting [3]</b> 4142/17 4142/18 4201/18 <b>tasks [2]</b> 4158/15 4158/17 <b>team [37]</b> 4101/17 4101/23 4101/25 4102/8 4114/19 4114/20 4114/23 4122/15 4129/20	





<b>T</b>	4138/22 4138/23 4138/24 4138/25 4145/18 4150/23 4151/2 4154/9 4154/15 4154/19 4154/24 4165/12 4165/23 4166/16 4169/11 4173/19 4174/24 4188/13 4188/18 4191/9 4197/5 4200/25 4203/20 4203/24 <b>times</b> [6] 4092/14 4117/25 4119/15 4137/9 4178/9 4178/25 <b>Tischler</b> [1] 4150/24 <b>title</b> [12] 4113/25 4119/11 4124/4 4124/8 4129/11 4129/15 4150/13 4161/4 4176/1 4176/4 4183/8 4184/21 <b>titled</b> [3] 4111/20 4114/13 4206/4 <b>titles</b> [2] 4165/3 4167/1 <b>TL</b> [2] 4129/13 4130/10 <b>today</b> [15] 4090/16 4092/4 4097/18 4097/24 4103/3 4103/4 4103/25 4107/3 4116/6 4161/6 4173/18 4176/13 4180/11 4190/18 4194/15 <b>together</b> [2] 4128/7 4187/23 <b>tomorrow</b> [1] 4087/20 <b>ton</b> [1] 4154/24 <b>tons</b> [1] 4154/19 <b>too</b> [6] 4092/1 4107/25 4121/13 4130/10 4143/24 4143/25 <b>tools</b> [1] 4204/2 <b>top</b> [13] 4092/11 4092/17 4092/23 4093/5 4096/17 4096/20 4116/19 4129/5 4142/10 4151/11 4158/8 4159/3 4176/25 <b>topic</b> [4] 4158/18 4183/7 4184/11 4204/12 <b>total</b> [8] 4100/21 4100/22 4133/16 4135/16 4138/7 4138/8 4138/9 4138/10 <b>totality</b> [2] 4100/5 4122/3 <b>Totally</b> [1] 4092/3 <b>touches</b> [1] 4097/25 <b>touching</b> [2] 4132/3 4141/19 <b>towards</b> [3] 4104/10 4157/18 4183/21 <b>trade</b> [1] 4165/5 <b>traffic</b> [5] 4100/20 4139/2 4139/3 4139/3 4195/15 <b>transcript</b> [3] 4083/9 4085/15 4206/3	<b>transcription</b> [1] 4085/16 <b>translate</b> [2] 4134/8 4135/12 <b>translation</b> [1] 4153/1 <b>travel</b> [4] 4132/16 4133/10 4133/10 4133/15 <b>treatment</b> [3] 4137/25 4138/12 4138/18 <b>trial</b> [2] 4083/9 4202/1 <b>tricky</b> [1] 4098/2 <b>tries</b> [4] 4094/24 4136/16 4137/6 4200/4 <b>trivial</b> [1] 4108/12 <b>true</b> [6] 4099/15 4099/16 4101/2 4105/6 4106/4 4200/20 <b>truly</b> [1] 4091/2 <b>try</b> [26] 4089/1 4089/9 4089/14 4090/10 4110/5 4115/12 4116/2 4116/6 4130/25 4137/2 4137/3 4137/4 4138/4 4140/5 4140/19 4144/5 4156/19 4163/25 4175/19 4176/16 4180/4 4194/23 4196/5 4199/18 4199/21 4200/6 <b>trying</b> [12] 4098/5 4099/7 4110/22 4116/4 4119/18 4136/10 4145/11 4166/11 4188/20 4188/21 4198/8 4199/16 <b>tune</b> [1] 4188/11 <b>tuned</b> [1] 4113/16 <b>tuning</b> [14] 4111/9 4111/12 4111/20 4112/6 4113/2 4113/5 4113/19 4114/3 4114/9 4122/17 4122/17 4134/13 4135/7 4152/16 <b>tunings</b> [6] 4101/5 4102/9 4111/16 4112/10 4112/14 4112/19 <b>turn</b> [18] 4092/8 4099/1 4102/5 4113/1 4116/14 4123/9 4125/6 4128/6 4137/12 4150/11 4160/24 4172/10 4176/17 4179/10 4180/13 4184/11 4187/9 4197/10 <b>two</b> [19] 4096/8 4116/14 4120/5 4122/25 4122/25 4138/15 4148/25 4165/11 4166/15 4168/6 4170/19 4170/20 4176/22 4177/1 4177/5 4182/3 4187/21 4193/6 4200/12	<b>two-page</b> [1] 4148/25 <b>TYLER</b> [1] 4084/19 <b>type</b> [1] 4186/17 <b>types</b> [1] 4114/4 <b>typically</b> [1] 4202/9 <b>typo</b> [1] 4119/12	<b>U</b> <b>U.S</b> [1] 4084/2 <b>Uh</b> [1] 4198/3 <b>Uh-huh</b> [1] 4198/3 <b>UI</b> [6] 4146/10 4146/11 4146/13 4146/15 4152/17 4157/9 <b>ultimate</b> [2] 4159/23 4177/4 <b>ultimately</b> [3] 4166/17 4195/10 4198/1 <b>under</b> [22] 4097/17 4120/15 4128/1 4130/17 4146/15 4161/8 4167/23 4168/16 4169/16 4170/5 4170/12 4170/16 4170/21 4170/21 4171/8 4173/12 4178/3 4178/10 4183/18 4185/6 4187/16 4188/9 <b>underdelivers</b> [1] 4115/15 <b>understand</b> [10] 4087/16 4089/5 4103/5 4106/6 4145/1 4146/23 4164/14 4165/10 4167/18 4180/24 <b>understanding</b> [2] 4168/3 4169/10 <b>understood</b> [3] 4110/21 4114/24 4164/11 <b>unexpressed</b> [1] 4168/20 <b>unfortunately</b> [1] 4181/3 <b>unit</b> [2] 4084/13 4097/23 <b>UNITED</b> [7] 4083/1 4083/3 4083/10 4084/6 4087/7 4087/24 4164/4 <b>United States</b> [3] 4087/7 4087/24 4164/4 <b>units</b> [1] 4153/15 <b>universally</b> [1] 4194/20 <b>University</b> [1] 4193/11 <b>unlikely</b> [3] 4100/4 4147/24 4199/25 <b>unredacted</b> [3] 4123/21 4123/24 4124/2 <b>unusually</b> [5] 4106/13 4108/9 4126/4 4127/10 4136/13 <b>up</b> [30] 4088/15 4091/9 4096/24 4099/14 4103/1 4103/2 4103/6 4103/23 4106/9 4106/18 4107/1 4108/2	4108/4 4108/24 4110/7 4116/5 4123/14 4140/25 4143/5 4158/8 4183/3 4187/23 4191/15 4192/6 4192/11 4192/11 4192/21 4198/18 4199/18 4203/13 <b>up</b> [1] 4186/11 <b>uplift</b> [1] 4177/12 <b>upper</b> [3] 4148/4 4174/1 4199/10 <b>upwards</b> [1] 4188/12 <b>UPX</b> [3] 4175/21 4180/15 4180/17 <b>UPX10</b> [9] 4091/17 4091/19 4091/22 4091/24 4092/8 4093/16 4095/8 4095/20 4096/5 <b>UPX1045</b> [4] 4175/17 4175/23 4180/17 4181/22 <b>UPX1046</b> [3] 4183/1 4183/5 4183/13 <b>UPX43</b> [3] 4111/18 4111/20 4111/24 <b>UPX465</b> [6] 4149/9 4150/12 4150/17 4151/9 4155/20 4157/6 <b>UPX467</b> [8] 4129/2 4129/4 4142/5 4148/8 4148/14 4148/19 4197/10 4197/12 <b>UPX509</b> [7] 4097/10 4098/8 4103/9 4104/2 4104/8 4104/17 4111/3 <b>UPX59</b> [5] 4184/12 4184/13 4184/15 4188/11 4188/22 <b>UPX811</b> [7] 4160/15 4160/21 4162/17 4163/12 4163/16 4164/12 4168/7 <b>UPX889</b> [5] 4114/12 4114/17 4116/11 4122/21 4127/14 <b>UPX9</b> [4] 4171/14 4172/17 4174/21 4175/1 <b>us</b> [15] 4103/13 4110/15 4130/16 4132/6 4137/6 4145/19 4151/23 4173/10 4186/13 4194/5 4198/12 4199/6 4199/6 4199/8 4199/9 <b>usdoj.gov</b> [2] 4084/5 4084/10 <b>use</b> [12] 4089/15 4098/5 4109/9 4118/22 4122/6 4122/10 4122/13 4134/12 4173/12 4185/10 4201/7 4201/10 <b>used</b> [8] 4089/23 4089/24 4097/2 4108/8 4118/7 4122/15
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<p><b>U</b></p> <p><b>used... [2]</b> 4186/10 4200/10</p> <p><b>useful [1]</b> 4194/20</p> <p><b>user [33]</b> 4091/7 4115/20 4115/20 4136/22 4137/2 4137/22 4138/14 4139/4 4142/20 4146/11 4146/13 4147/5 4159/23 4161/24 4169/2 4169/5 4169/7 4169/11 4169/19 4169/20 4169/24 4194/6 4195/7 4195/8 4195/11 4196/12 4196/14 4196/16 4199/14 4199/17 4199/19 4201/24 4201/25</p> <p><b>user's [1]</b> 4170/2</p> <p><b>users [24]</b> 4096/4 4096/11 4099/8 4116/5 4136/16 4136/24 4138/23 4146/24 4147/24 4161/11 4172/5 4194/10 4195/1 4195/5 4195/14 4195/17 4196/9 4196/13 4197/2 4197/4 4197/6 4198/24 4199/2 4199/23</p> <p><b>users' [1]</b> 4196/9</p> <p><b>uses [3]</b> 4097/3 4097/7 4130/1</p> <p><b>using [5]</b> 4133/13 4153/4 4156/6 4187/18 4202/9</p> <p><b>usually [6]</b> 4100/15 4170/1 4175/15 4196/12 4202/7 4202/12</p>	<p><b>variables [2]</b> 4096/21 4204/17</p> <p><b>variations [1]</b> 4162/2</p> <p><b>Varies [1]</b> 4191/4</p> <p><b>variety [3]</b> 4193/20 4201/13 4201/18</p> <p><b>various [2]</b> 4134/12 4169/21</p> <p><b>vary [1]</b> 4204/13</p> <p><b>varying [1]</b> 4130/25</p> <p><b>Venkataraman [1]</b> 4151/3</p> <p><b>verbiage [1]</b> 4128/18</p> <p><b>vernacular [1]</b> 4187/7</p> <p><b>version [7]</b> 4092/19 4096/19 4096/22 4101/16 4123/13 4123/24 4169/23</p> <p><b>versus [5]</b> 4087/8 4141/22 4143/25 4157/14 4200/5</p> <p><b>very [21]</b> 4090/12 4091/2 4092/11 4092/11 4092/17 4092/17 4092/18 4092/23 4093/3 4093/5 4096/22 4138/21 4142/23 4149/15 4150/18 4164/8 4179/5 4181/3 4194/22 4204/7 4204/13</p> <p><b>via [4]</b> 4152/16 4195/21 4202/4 4204/20</p> <p><b>vice [1]</b> 4192/14</p> <p><b>view [4]</b> 4103/13 4167/15 4174/6 4196/6</p> <p><b>visiting [1]</b> 4203/23</p> <p><b>voice [1]</b> 4192/21</p> <p><b>vs [1]</b> 4083/5</p>	<p>4134/7 4134/24 4134/25 4138/7 4138/10 4138/18 4138/18 4140/19 4141/16 4141/17 4141/25 4142/19 4144/20 4145/5 4145/6 4145/11 4145/17 4145/18 4146/12 4150/17 4150/24 4150/25 4151/7 4153/21 4155/12 4156/21 4156/22 4157/24 4157/25 4158/17 4158/22 4159/11 4159/13 4161/10 4161/18 4162/16 4163/17 4164/20 4165/7 4165/9 4165/19 4166/15 4167/8 4170/8 4173/8 4173/9 4173/20 4174/7 4174/21 4176/9 4176/9 4179/24 4180/21 4181/13 4181/15 4188/5 4188/7 4188/7 4189/22 4190/16 4197/19</p> <p><b>Washington [4]</b> 4083/5 4084/3 4085/4 4085/14</p> <p><b>wasn't [3]</b> 4133/13 4171/23 4192/11</p> <p><b>Waszmer [3]</b> 4085/6 4191/13 4192/8</p> <p><b>waters [1]</b> 4092/1</p> <p><b>way [16]</b> 4100/3 4101/15 4101/21 4101/23 4102/1 4104/8 4118/11 4118/16 4121/18 4122/16 4130/24 4137/20 4140/3 4144/11 4185/11 4197/6</p> <p><b>ways [2]</b> 4089/16 4198/11</p> <p><b>wc.com [2]</b> 4085/5 4085/5</p> <p><b>we [189]</b></p> <p><b>We understand [1]</b> 4087/16</p> <p><b>we will [1]</b> 4128/7</p> <p><b>We'd [1]</b> 4178/6</p> <p><b>we'll [23]</b> 4087/18 4088/17 4098/20 4099/1 4099/19 4101/8 4115/15 4117/19 4131/3 4137/22 4137/24 4145/22 4147/24 4149/13 4149/14 4159/14 4160/25 4168/23 4176/17 4191/19 4196/17 4205/5 4205/8</p> <p><b>we're [55]</b> 4090/16 4094/19 4095/17 4095/19 4096/5 4096/16 4096/18 4097/16 4103/3</p>	<p>4103/24 4104/7 4111/4 4111/21 4112/7 4119/10 4123/12 4123/20 4123/22 4125/7 4126/11 4127/13 4128/25 4132/1 4134/7 4144/8 4145/23 4147/17 4149/8 4149/10 4152/25 4158/18 4159/16 4160/14 4160/16 4160/17 4162/17 4162/18 4167/12 4168/25 4169/13 4175/8 4175/25 4180/2 4180/17 4181/21 4191/14 4191/18 4192/5 4195/12 4196/5 4198/7 4200/5 4200/7 4201/5 4203/14</p> <p><b>we've [8]</b> 4092/1 4107/2 4116/19 4139/18 4148/23 4166/13 4183/7 4194/3</p> <p><b>weak [2]</b> 4120/6 4120/15</p> <p><b>web [2]</b> 4162/1 4201/10</p> <p><b>WEBB [1]</b> 4084/19</p> <p><b>website [7]</b> 4100/20 4151/23 4202/8 4202/10 4203/19 4203/24 4204/22</p> <p><b>websites [1]</b> 4195/15</p> <p><b>weighing [1]</b> 4167/5</p> <p><b>weights [1]</b> 4111/13</p> <p><b>welcome [6]</b> 4088/1 4116/9 4119/19 4140/22 4142/3 4150/11</p> <p><b>well [20]</b> 4088/15 4099/2 4101/13 4109/10 4111/19 4115/25 4118/14 4126/17 4151/19 4161/2 4166/9 4166/23 4170/25 4172/20 4184/24 4187/2 4187/3 4187/3 4187/11 4201/24</p> <p><b>Wendy [2]</b> 4085/6 4192/7</p> <p><b>went [3]</b> 4103/22 4107/1 4200/18</p> <p><b>were [36]</b> 4091/5 4091/7 4098/24 4098/25 4100/13 4108/14 4110/2 4123/1 4128/1 4128/13 4128/14 4128/20 4131/17 4133/7 4133/14 4139/7 4141/4 4146/24 4148/10 4154/1 4161/8 4161/21 4164/15 4165/25 4171/20 4171/22 4171/24 4173/12</p>	<p>4179/15 4179/15 4179/22 4180/9 4181/24 4190/9 4193/23 4201/25</p> <p><b>wfcavanaugh [1]</b> 4084/21</p> <p><b>what [123]</b> 4090/19 4090/24 4092/6 4093/9 4093/16 4096/10 4098/25 4101/1 4101/2 4103/6 4108/21 4110/21 4110/22 4113/2 4115/3 4115/7 4117/14 4118/22 4119/18 4120/13 4121/16 4122/13 4124/8 4126/24 4127/12 4127/18 4129/23 4131/11 4135/5 4135/6 4135/25 4136/10 4137/6 4138/1 4138/7 4138/9 4138/15 4139/8 4142/18 4143/3 4143/9 4144/15 4144/16 4144/18 4145/12 4146/12 4146/18 4147/2 4147/14 4147/16 4148/3 4151/19 4154/17 4154/24 4156/11 4157/23 4158/12 4158/23 4159/13 4161/6 4161/21 4162/8 4162/12 4163/16 4165/13 4165/19 4165/25 4166/8 4166/9 4167/8 4168/5 4168/10 4168/20 4169/13 4169/19 4169/20 4170/7 4170/11 4172/14 4172/23 4172/24 4173/5 4173/13 4173/17 4174/6 4178/24 4179/17 4179/18 4181/7 4181/9 4185/2 4185/21 4185/25 4186/6 4186/8 4187/17 4187/20 4188/7 4188/9 4188/20 4189/21 4189/25 4190/9 4190/12 4192/12 4192/18 4192/24 4193/19 4194/4 4194/9 4194/24 4195/4 4196/12 4198/25 4199/3 4199/8 4201/23 4202/3 4202/16 4203/21 4203/22 4204/5 4204/9</p> <p><b>what's [8]</b> 4100/14 4124/16 4130/22 4139/17 4144/3 4177/6 4193/22 4197/3</p> <p><b>whatever [4]</b> 4098/4 4140/16 4143/17 4195/9</p>
<p><b>V</b></p> <p><b>value [27]</b> 4090/18 4091/15 4097/23 4099/8 4104/22 4105/5 4105/6 4113/25 4115/5 4115/9 4115/25 4117/5 4117/21 4121/18 4122/1 4124/13 4124/21 4125/15 4125/19 4127/15 4128/2 4128/21 4196/3 4197/1 4197/2 4197/4 4197/4</p> <p><b>values [1]</b> 4140/9</p> <p><b>vanilla [20]</b> 4117/21 4118/3 4118/4 4118/7 4118/10 4118/11 4118/16 4118/19 4118/19 4118/21 4118/24 4118/24 4119/1 4119/3 4119/11 4119/15 4120/18 4120/24 4121/4 4121/14</p> <p><b>variable [1]</b> 4096/21</p>	<p><b>W</b></p> <p><b>W.H [1]</b> 4085/6</p> <p><b>wait [1]</b> 4181/14</p> <p><b>Wall [1]</b> 4153/21</p> <p><b>want [14]</b> 4092/17 4098/4 4102/23 4123/21 4136/24 4138/4 4164/17 4164/18 4165/12 4185/9 4187/21 4188/22 4196/15 4201/19</p> <p><b>wanted [1]</b> 4087/16</p> <p><b>wants [1]</b> 4166/20</p> <p><b>was [91]</b> 4090/21 4091/15 4091/19 4091/19 4092/6 4092/12 4092/13 4093/13 4098/8 4100/11 4100/12 4108/9 4110/17 4110/18 4110/19 4110/22 4111/3 4112/2 4118/14 4122/14 4124/2 4125/8 4125/9 4126/4 4129/19 4129/21 4129/23 4133/6 4133/13 4134/2</p>			

<b>W</b>	4107/21 4109/4 4109/13 4111/12 4111/18 4111/25 4112/21 4122/7 4125/7 4128/19 4129/2 4130/7 4131/8 4133/14 4134/24 4136/12 4142/22 4147/3 4152/24 4155/14 4155/20 4159/23 4160/15 4160/17 4161/3 4163/16 4164/15 4164/22 4166/18 4172/3 4174/24 4175/17 4177/8 4177/24 4180/15 4187/24 4194/8 4194/13 4195/10 4197/19 4199/10	4099/14 4102/22 4144/7 4145/13 4158/9 4158/13 4178/21 4179/7 4179/20 4180/21 4194/22 <b>without [4]</b> 4123/19 4132/20 4133/3 4163/20 <b>witness [4]</b> 4086/2 4088/7 4110/16 4166/21 <b>WITNESSES [1]</b> 4086/4 <b>won't [3]</b> 4161/9 4163/8 4183/2 <b>wonder [1]</b> 4104/22 <b>word [7]</b> 4096/1 4099/13 4101/2 4102/11 4153/4 4173/22 4204/16 <b>words [6]</b> 4129/16 4129/24 4147/21 4156/6 4203/22 4204/16 <b>work [6]</b> 4141/18 4141/21 4152/17 4154/8 4160/3 4196/18 <b>working [4]</b> 4145/9 4145/10 4145/10 4193/2 <b>works [5]</b> 4094/20 4102/14 4102/19 4120/1 4201/6 <b>world [1]</b> 4136/12 <b>world's [1]</b> 4194/19 <b>worried [2]</b> 4092/6 4190/9 <b>would [163]</b> <b>wouldn't [6]</b> 4114/22 4123/7 4170/17 4173/16 4178/13 4190/6 <b>writing [2]</b> 4123/2 4131/17 <b>written [1]</b> 4165/24 <b>wrong [1]</b> 4111/23 <b>wrote [10]</b> 4129/4 4131/10 4132/6 4135/22 4142/10 4150/17 4156/8 4171/12 4171/18 4172/17 <b>wsgr.com [1]</b> 4085/10 <b>wwaszmer [1]</b> 4085/10	4140/20 4152/11 4152/15 4152/16 4153/8 4155/15 4156/2 4156/10 4157/8 4159/18 4172/20 4189/18 4191/4 <b>years [7]</b> 4139/18 4152/14 4153/7 4154/16 4158/1 4193/6 4193/9 <b>yes [30]</b> 4090/5 4092/21 4093/25 4107/7 4110/4 4122/7 4129/10 4129/18 4132/9 4133/9 4134/17 4135/2 4135/24 4151/7 4152/3 4154/10 4155/25 4156/3 4156/10 4171/10 4171/19 4175/16 4177/25 4187/4 4189/7 4189/15 4191/1 4191/7 4195/3 4203/12 <b>yesterday [21]</b> 4088/17 4088/19 4089/18 4090/3 4090/14 4090/17 4092/12 4093/16 4093/18 4096/2 4096/7 4097/3 4099/24 4110/15 4110/23 4117/15 4132/10 4192/11 4194/15 4195/22 4198/19 <b>yet [5]</b> 4138/23 4139/4 4139/6 4143/2 4204/8 <b>York [2]</b> 4084/20 4085/9 <b>you [504]</b> <b>you know [1]</b> 4145/17 <b>you'd [2]</b> 4145/24 4188/6 <b>writing [1]</b> 4187/11 <b>you're [42]</b> 4094/7 4096/10 4102/18 4104/12 4109/24 4111/9 4114/15 4116/3 4116/9 4119/19 4122/15 4125/22 4128/9 4129/8 4131/19 4132/7 4132/24 4133/24 4136/5 4140/22 4141/20 4142/3 4147/3 4147/12 4150/14 4151/16 4155/23 4156/20 4157/18 4158/12 4159/21 4163/23 4175/8 4175/10 4179/12 4181/10 4184/6 4184/14 4184/24 4184/25 4189/25 4202/4 <b>you've [8]</b> 4091/23 4097/13 4154/8 4159/7 4165/21 4182/5 4191/6 4197/24 <b>your [122]</b> 4087/6	4087/23 4088/5 4090/21 4091/17 4091/22 4101/23 4102/5 4104/7 4104/17 4105/7 4107/8 4107/11 4107/14 4109/6 4110/13 4110/14 4110/19 4110/25 4111/19 4114/20 4119/21 4122/15 4123/18 4123/20 4125/8 4125/9 4126/8 4126/9 4128/6 4129/3 4129/4 4131/19 4133/15 4134/18 4135/21 4137/12 4137/12 4140/23 4141/1 4141/2 4142/10 4142/12 4143/19 4144/7 4148/11 4148/11 4148/20 4149/2 4149/3 4149/16 4149/24 4150/7 4150/9 4150/17 4153/2 4154/8 4156/6 4156/25 4159/22 4160/15 4161/19 4162/24 4163/1 4163/9 4164/2 4164/11 4164/19 4164/20 4165/7 4165/15 4166/2 4166/12 4166/20 4166/24 4167/17 4167/18 4173/22 4174/6 4174/15 4174/20 4175/17 4179/10 4181/13 4181/15 4182/8 4182/13 4182/23 4183/4 4183/6 4183/7 4185/17 4186/11 4186/12 4187/24 4188/4 4189/3 4189/16 4190/5 4190/15 4190/20 4191/8 4191/12 4191/14 4191/17 4192/12 4192/18 4192/21 4193/14 4193/16 4194/14 4196/2 4196/18 4197/10 4197/15 4198/18 4198/23 4200/25 4202/3 4203/14 4205/1 4205/7 <b>Your Honor [39]</b> 4087/6 4087/23 4088/5 4091/22 4107/11 4107/14 4110/14 4110/25 4123/20 4125/8 4140/23 4149/16 4150/7 4150/9 4162/24 4163/1 4163/9 4164/2 4164/11 4164/19 4164/20 4165/7 4165/15 4166/2 4166/12 4166/20 4166/24 4167/17
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**Y**

**Your Honor... [11]**

4167/18 4182/23  
4183/6 4190/20 4191/8  
4191/12 4191/14  
4191/17 4200/25  
4203/14 4205/1

**yourself [6]** 4126/12  
4138/6 4138/9 4149/24  
4151/6 4154/12

**Z**

**Zaremba [3]** 4085/11  
4206/2 4206/8

**zero [4]** 4100/5  
4117/11 4117/16  
4121/1