1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 _____

3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4 _____

CERTIFIED COPY

5 DATAVANT, INC.,

6 Petitioner,

7 v.

8 VIGILYTICS LLC,

9 Patent Owner.

10 _____

11 IPR2024-00307 / Patent 9,965,651

12 IPR2024-00311 / Patent 10,109,375

13 IPR2024-00381 / Patent 10,886,012

14 IPR2024-00382 / Patent 9,665,685

15 _____

16

17 ORAL DEPOSITION OF DR. PAUL C. CLARK

18

19 Friday, November 8, 2024

20

Ref. 25412-0021IP1, 25412-0022IP1,
21 25412-0023IP1 and 25412-0024IP1

22

23 Reported by:

24 SUSAN ASHE, CER

25 Job No.: 143959

Exhibit 2002
Datavant v. Vigilytics
IPR2024-00382

Videoconference deposition of DR. PAUL~C. CLARK, taken on behalf of the Patent Owner, beginning at 9:37 a.m., on Friday, November 8, 2024, via Zoom, before Susan Ashe, Certified Electronic Reporter and an eNotary of the Commonwealth of Virginia.

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19
20
21
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THE WITNESS
Dr. Paul C. Clark

BY MR. STEPHENS 5

PREVIOUSLY MARKED EXHIBITS

PATENT OWNER

Exhibit No.		Introduced
Exhibit 1009	Murphy Reference	7
Exhibit 1005	Evenhaim Reference	21
Exhibit 1001	Patent 9,965,651 B1	23

(REPORTER'S NOTE: All quotations from exhibits are reflected in the manner in which they were read into the record and do not necessarily denote an exact quote from the document.)

1 FRIDAY, NOVEMBER 8, 2024;
2 9:37 A.M. EASTERN STANDARD TIME
3 --o0o--
4 All counsel present stipulate
5 that the witness shall be sworn remotely
6 by the court reporter.
7 * * *
8 Whereupon,
9 DR. PAUL C. CLARK
10 having been first duly sworn, was examined
11 and testified as follows:
12 EXAMINATION
13 BY MR. STEPHENS:
14 Q. My name is Nick Stephens. I'm an attorney
15 with Fish & Richardson, and I'll be taking the
16 deposition today on behalf of Patent Owner,
17 Vigilytics.
18 Do you understand?
19 A. I do.
20 MR. STEPHENS: Would counsel for
21 petitioner like to make their appearance.
22 MR. OLIVER: Justin Oliver, on
23 behalf of the Petitioner, Datavant.
24 BY MR. STEPHENS:
25 Q. And we are here today regarding four IPR

1 proceedings. That's IPR -- these are IPRs on the
2 '651, '375, '012 and '685 patents.
3 Do you understand?
4 A. I do.
5 Q. And this deposition is being transcribed
6 today.
7 Do you understand that?
8 A. Yes.
9 Q. To ensure a clean record, I'll aim not to
10 interrupt you while you're answering. And I'd ask
11 if you'd be able to do the same for me.
12 Does that sound all right?
13 A. Yes.
14 Q. If you need a break at any time during the
15 deposition, of course feel free to let me know.
16 Can you please state your full name for
17 the record.
18 A. Paul C. Clark.
19 Q. Do you understand that you're under oath?
20 A. I do.
21 Q. Is there any reason that you cannot give
22 truthful and accurate testimony today?
23 A. No.
24 Q. All right. And before we started, you
25 just downloaded files from the '375 IPR record.

1 Is that correct?
2 A. Yes.
3 Q. I'd like to start with the Murphy
4 reference from that record, which is Exhibit 1009.
5 (Whereupon, Patent Owner Exhibit 1009,
6 previously marked, was presented to the witness.)
7 A. Yes.
8 Q. And besides the files that you downloaded
9 from the links we've sent, do you have any other
10 files or materials with you?
11 A. Well, I have a ton available but none
12 open.
13 Q. Okay. You're familiar with the Murphy
14 reference. Correct?
15 A. Yes.
16 Q. Is there any reason that you'll not be
17 able to address questions about Murphy's disclosure
18 today?
19 A. Not that I'm aware of, but we'll find out.
20 Q. All right. So I'd like to start with
21 Page 552 of Murphy.
22 (Pause.)
23 Q. Let me know when you're.
24 A. I'm there.
25 Q. All right. And you see a Figure 1

1 depicted on Page 552. Correct?
2 A. I do.
3 Q. What's shown in Figure 1?
4 A. I really can't read it very well, as it
5 turns out.
6 It looks like a Microsoft finder of some
7 kind -- let me see if I can blow it up and get any
8 help, but it's not very clear.
9 Q. Would you agree that Figure 1 depicts a
10 graphical interface of the query tool in Murphy?
11 A. I mean, that's the way it's described.
12 And it certainly looks like that.
13 Like I said, it's a Microsoft standard
14 widget finder that is supposed to be directing
15 queries to a clinical data warehouse.
16 Q. And can you explain how the query tool
17 works in Murphy?
18 A. It looks like it constructs, from the way
19 it's described, boolean queries, hierarchically.
20 Q. What does that mean to you, boolean
21 queries arranged hierarchically?
22 A. It means that it's a hierarchical database
23 and that you would use standard boolean queries,
24 probably using something like SQL.
25 Q. And what types of parameters could be

1 included in Murphy's boolean queries?
2 A. As long as they don't interfere with one
3 of the inference filters, pretty much anything, it
4 looks like.
5 Q. Are there any restrictions on the types of
6 information that could be included in a query in
7 Murphy?
8 A. Well, it depends on where the filters are
9 implemented. But -- I mean, the -- Murphy is all
10 about restricting queries.
11 Q. And then, what types of results are
12 returned by the query tool in Murphy?
13 A. That would be field data from the data
14 warehouse.
15 Q. What do you mean by "field data"?
16 A. Data that's stored in the database. It's
17 stored in fields, usually.
18 Q. Can you give some examples?
19 A. Well, I mean, there are plenty right here
20 in the reference:
21 ...data includes
22 diagnoses, medications,
23 procedures, and lab tests --
24 would be examples.
25 Q. Now, the query tool in Murphy returns a

1 number of patients that satisfy the conditions in
2 the query.
3 Is that correct?
4 A. Well, that's one example of things that it
5 could return.
6 Q. Are you aware of any disclosure in Murphy
7 of results that contain other information?
8 A. I would have to read the entire reference.
9 But -- I mean, it's a standard database
10 so -- and it has a standard query tool, so I'm
11 pretty sure I can get whatever results I want out of
12 it.
13 Q. In the way that Murphy implemented it, are
14 there examples in the reference of the results
15 including any information besides a number of
16 patients?
17 A. Well, like I said, I'd have to read the
18 whole thing. But it's a standard database, so it
19 would have the ability to return answers to all
20 types of standard queries.
21 Q. Yeah, and if you'd like to take some time
22 to review the reference, please do so.
23 You could point -- point me to any
24 examples of results that include information besides
25 the number of patients.

1 (Witness reading.)
2 A. It says:
3 For example, in a study on
4 adverse -- or drug adverse
5 events, one may want to find
6 all cases where a rise in liver
7 function tests followed the
8 initiation of a drug by
9 1-3 days.
10 So that would be an example where you
11 would be returning information about the events.
12 Q. Where is that in the reference?
13 A. It is 553, about midway down the column,
14 left column.
15 Q. And this paragraph relates to -- strike
16 that question.
17 Are you aware of any other examples in
18 Murphy?
19 A. I mean, I can go looking for more -- but
20 it doesn't really matter, does it? We found an
21 example.
22 Q. I'm just asking if --
23 A. I don't -- I don't have the reference
24 memorized, Counselor, no.
25 Q. Can you please direct me to any other

1 examples -- well, let me know if you are not aware
2 of other examples.
3 A. I am not, as I sit here, aware of other
4 examples.
5 Q. All right. Let's turn to Page 553 again,
6 and I'll refer to the same paragraph that you just
7 pointed to, beginning with:
8 An approach to preventing
9 the identification of
10 individuals....
11 Do you see that?
12 A. Yes.
13 Q. If you'd like, please take a moment to
14 review that paragraph.
15 (Witness reading.)
16 A. Okay.
17 Q. In this paragraph, Murphy describes
18 problems with techniques that involve
19 de-identification of patient data records. Correct?
20 A. Information loss, in particular.
21 Q. And so, the solution proposed by Murphy
22 involves a query tool that searches data records
23 that have not been de-identified. Correct?
24 A. No; I think it could search de-identified
25 data -- if you wanted to. It just does not want it

1 to be fully HIPAA compliant with regard to data
2 destruction.
3 Q. So Murphy does not warrant HIPAA
4 compliance?
5 A. It does. In fact, it's solving --
6 attempting to solve the inference problem that may
7 still exist in the HIPAA-compliant database.
8 COURT REPORTER: Could you
9 repeat your question -- "So Murphy does
10 not 'want' compliance?"
11 Is that what you said?
12 MR. STEPHENS: I believe I
13 asked, "And so Murphy does not want HIPAA
14 compliance?"
15 That's H-I-P-A-A.
16 COURT REPORTER: Thank you.
17 MR. STEPHENS: Like -- yeah,
18 like what we -- what your doctor's office
19 asks about: Health Insurance Portability
20 Accountability Act.
21 COURT REPORTER: Thank you.
22 (Pause.)
23 THE WITNESS: Same answer.
24 BY MR. STEPHENS:
25 Q. But it's not necessary for Murphy's

1 database to be -- to include de-identified patient
2 data records. Correct?
3 A. It may or it may not be. It allows for
4 both cases.
5 What it's trying to avoid is the
6 information loss that comes with
7 de-identification -- in particular, date/time
8 information so you can order events.
9 Q. All right. Let's turn to the next page,
10 page 554, please.
11 And in the left column, the paragraph that
12 begins with, "As the numbers..." -- do you see that?
13 A. Yes.
14 Q. If you'd like to take a moment to review,
15 please do.
16 (Witness reading.)
17 A. Okay.
18 Q. And this paragraph refers to a "history
19 table." Correct?
20 A. Yes.
21 Q. How does Murphy use the history table to
22 determine whether a user can perform further
23 queries?
24 A. Well, there's a variety of ways.
25 What they're attempting to solve is what's

1 called the "inference problem," which is well known.
2 And so, they do that by keeping track of
3 the queries and the time period within which those
4 were issued by a particular user, so that they can
5 prevent them from inferring sensitive information.
6 Q. And Murphy discloses that the history
7 table contains, quote:
8 ...for each query,
9 date/time, the user ID, and the
10 number of patients truly
11 returned by the queries.
12 Correct?
13 A. Yeah, those are among things that you
14 could track, but I don't think you're limited.
15 Q. There are no other examples of other data
16 stored in the history table. Correct?
17 A. Well, they're talking, again, about
18 obfuscating data. So they're giving an example, but
19 it is only exemplary.
20 The....
21 What this is about is solving what's
22 called the "inference problem," which has been known
23 since the '80s.
24 Q. And again, I'll just ask: Are there any
25 other examples expressly disclosed in Murphy?

1 (Simultaneous speaking.)
2 A. I don't -- go ahead. Sorry.
3 Q. Yeah. Are there any other examples of
4 other data stored in the history table given in
5 Murphy?
6 A. There may be. I don't have total recall
7 of the reference, but, again, that's exemplary --
8 so, there may be others.
9 Q. I'll give you an opportunity to point to
10 any other examples.
11 Are you able to provide any?
12 A. I'm not going to read the whole reference
13 to find another example.
14 Q. You're declining to provide any examples,
15 further examples?
16 A. I'm not aware, as I'm sitting here, from
17 memory, of any other examples. But there may be
18 others in the reference.
19 Q. That's fine. I just want the record to
20 reflect: I'm giving you the opportunity to review
21 the reference. If you don't want to do so --
22 A. Yeah, I don't think it's necessary, for
23 this exercise, for me to read all the references in
24 their entirety for you.
25 I'm here to answer your questions.

1 Q. And just to be clear -- I don't want this
2 to be contentious, Dr. Clark -- my question is
3 whether there are other examples given in Murphy
4 as -- of additional data stored in the history
5 tables.
6 Are you aware of any such examples?
7 A. Not from memory, no.
8 Q. Would you agree that the determination in
9 Murphy whether to prevent a user from performing
10 further queries requires that the current query
11 actually be processed to determine the true number
12 of patients returned by that query?
13 MR. OLIVER: Objection,
14 foundation, form.
15 A. Yeah. I mean, I'm not sure that that
16 limitation's in place. I mean, that is certainly
17 one place you could implement the filtering. But it
18 would -- it's more efficient to stop that process as
19 far up the pipeline as possible.
20 So to the extent you could not process the
21 query and block it, it would be desirable to do so.
22 Q. Well, I'm asking about the methodology
23 that's described in the paragraph we just reviewed.
24 Do you understand that?
25 A. I do.

1 Q. Okay. And that method involves checking
2 the true number of patients identified in response
3 to a query against the true number of patients that
4 are stored in the history table.
5 Is that correct?
6 A. That's what it says.
7 Q. Okay. And so, my question was: To
8 determine whether to prevent the user from issuing
9 additional queries, the system has to process the
10 current query to check the number of patients that
11 are returned in response to it. Correct?
12 A. I don't think that's accurate.
13 As I said, yeah, that might be one way to
14 do it -- but there are others.
15 Q. Okay. How is the check made as to whether
16 there are the same number of patients returned in
17 response to a query in Murphy?
18 A. Well, it may be that you've hit a
19 threshold in the history table before you even get
20 to that query.
21 So it's possible that you could block the
22 query without actually making it.
23 Q. When you say a "threshold," what are you
24 referring to there?
25 A. Murphy deals with rules and thresholds

1 according to those rules. And you can set those
2 however you like, whether it's number of patients,
3 number of queries, any period of time -- I mean,
4 there's any number of ways to what they call
5 "obfuscate" -- but, prevent inference.
6 Q. What does the "threshold" relate to that
7 you're referring to right now?
8 A. It depends on the rule that's in place.
9 Q. Okay. I think that we're maybe going
10 beyond what I'm really trying to get to here.
11 I'm just asking you about this paragraph
12 that's on Page 554.
13 Is there a threshold in play in this
14 methodology that's described in -- on Page 554?
15 A. Yes. In that case, it would be the number
16 of queries with a certain number of results.
17 Q. And the disclosure in the paragraph that
18 we just reviewed does not involve checking the
19 identities of patients returned in response to the
20 queries. Correct?
21 MR. OLIVER: Objection; form.
22 A. It does not say in that paragraph that
23 it's looking at the identity of the patients, no.
24 Q. All right. Let's turn to Page 556,
25 please.

1 A. Okay.
2 Q. In the right column towards the top of the
3 page, the paragraph that -- the first full paragraph
4 that begins with, "The data obfuscation..." -- do
5 you see that?
6 A. Yes.
7 Q. And the first two sentences read that:
8 The data obfuscation
9 method discussed in this paper
10 does not limit the logic of the
11 query, nor the data elements or
12 values that can be used in the
13 query. It depends exclusively
14 on the numeric quantity of the
15 results.
16 Did I read that correctly?
17 A. That's what it says.
18 Q. Would you agree, then, that Murphy does
19 not impose any restrictions on the query based on a
20 minimum number of individuals?
21 A. Well, it certainly could. I mean, it
22 depends how those rules are set.
23 I mean, I get that you want to generalize
24 what this says in the summary. But -- I mean, I
25 would understand that you wouldn't want to return

1 a -- below a threshold number of individuals, for
2 the reasons that they're discussing "Inu"
3 (phonetic).
4 Q. Murphy does not disclose any restrictions
5 on the number of patients in the query. Correct?
6 A. I'm not sure that that's correct.
7 I mean, I would understand that you're
8 trying to solve this inference problem. I mean, at
9 the core of that would be that you wouldn't want to
10 return, you know, one or two patients that could
11 then be compared. I mean, that would be insecure.
12 So -- I mean, I would think that that's
13 baked into this. But...I mean, I don't see an
14 explicit threshold on the number.
15 I mean, that's mentioned in HIPAA, which
16 is mentioned in here. But -- I mean, I don't see an
17 explicit threshold for minimum number of patients in
18 the reference, if that's what you're driving at.
19 Q. Okay. In the zip file that we sent you,
20 there is a reference, Exhibit 1005, the other named
21 reference. You have to pull that open, please.
22 A. I will.
23 MR. STEPHENS: And for the court
24 reporter, that's a name spelled
25 E-v-e-n-h-a-i-m.

1 (Whereupon, Patent Owner Exhibit 1005,
2 previously marked, was presented to the witness.)
3 Q. Okay. You're familiar with the Evenhaim
4 reference. Correct?
5 A. I am.
6 Q. All right. I'd like to turn to the
7 paragraph that begins at Column 8, Line 65.
8 (Pause.)
9 Q. Let me know once you've had a chance to
10 review.
11 A. That's what I'm doing.
12 (Witness reading.)
13 A. Okay.
14 Q. This paragraph refers to answering the
15 user's query. Right?
16 A. Yeah. It's an example of a type of query
17 they might use to market physicians -- I don't know.
18 Q. I didn't get the last part of that
19 response, Dr. Clark. Can you say that again.
20 A. I said it's providing an example where a
21 pharmaceutical company might want to identify
22 physicians to market.
23 Q. And it states that:
24 In order to answer the
25 query, the source entity must

1 compare records with same
2 patient names & IDs to name &
3 ID specific physician records.
4 Correct?
5 A. That's what it says.
6 Q. Based on your understanding of HIPAA, a
7 de-identified patient record would not reveal the
8 patient's name. Correct?
9 A. Not in plain text, no.
10 Q. All right. Could you open the '375
11 patent, please.
12 A. Okay.
13 Q. One moment, actually. I may be referring
14 to the....
15 (Pause.)
16 Q. Yeah -- if you wouldn't mind, in the list
17 of the links that we provided, could you download
18 the record for the '651 patent.
19 (Pause.)
20 A. Okay. I've got them.
21 Q. All right. And if you would, please open
22 Exhibit 1001, the '651 patent.
23 (Whereupon, Patent Owner Exhibit 1001,
24 previously marked, was presented to the witness.)
25 Q. And once you have that, I'll refer to

1 Claim 7, which is towards the end of the patent.
2 A. All right.
3 Q. All right. And in Claim 7, about
4 two-thirds of the way down through the claim,
5 there's a reference to a "privacy preserving rule."
6 Let me know when you see that.
7 (Pause.)
8 A. Oh, "privacy preserving rule," you mean?
9 Q. Yes.
10 A. Okay. I thought you said "tool."
11 Q. Sorry about that. Yes, "privacy
12 preserving rule."
13 A. I see it.
14 Q. And so, in context, this claim reads:
15 Comparing the request
16 tokens to tokens associated
17 with the medical data to find
18 matching tokens and to
19 determine whether the group
20 includes at least a minimum
21 number of individuals to be
22 included in a report in
23 response to the request,
24 wherein the minimum number of
25 individuals are selected

1 according to at least a privacy
2 preserving rule that disallows
3 same individuals to be included
4 within a defined period of
5 time.
6 Correct?
7 A. Yes.
8 Q. How does this rule promote patient
9 privacy?
10 A. It doesn't want you to -- again, this is
11 the inference problem -- it doesn't want you to
12 repeatedly issue queries that include the same
13 individual, so that you can narrow the information
14 and infer information about an individual.
15 So it's, again, trying to solve the data
16 inference problem, which was well known.
17 Q. So the rule, then -- this allows the same
18 individuals from being included in requests from the
19 user device a given number of times over a period of
20 time?
21 A. That's what it says.
22 Q. And then, further up in the claim, after
23 the claim preamble there's a receiving step.
24 Do you receive that -- or, I'm sorry, do
25 you see that, receiving a request?

1 A. Yes.
2 Q. And in context -- I'll read this
3 limitation again -- it recites:
4 Receiving a request from a
5 user device for information
6 that characterizes a group
7 composed of multiple
8 individuals from a set of
9 de-identified data,
10 representing characteristics of
11 the individuals pre or post
12 encounter at the healthcare
13 facility.
14 Did I read that correctly?
15 A. That's what it says.
16 Q. Based on your understanding of this
17 limitation, does it require that the request be
18 generated based on information from the set of
19 de-identified data?
20 MR. OLIVER: Objection, form.
21 A. It says "from a set of de-identified
22 data."
23 Q. So you do believe the request is generated
24 from the set of de-identified data?
25 A. No. It's a request for information from a

set of de-identified data.

Q. And what's the distinction there?

A. Your statement was ambiguous. I was making it clear.

Q. So the information must be from the set of de-identified data?

A. That's correct.

MR. STEPHENS: Okay. We have no further questions.

THE WITNESS: Okay.

MR. OLIVER: No questions for the witness.

MR. STEPHENS: All right. Thank you.

(Whereupon the deposition concluded at 10:17 a.m.)

1 DEPONENT'S SIGNATURE
2
3 Please be advised I have read the
4 foregoing deposition, pages 1 through 27, inclusive.
5 I hereby state there are:
6 (Check one)
7 _____ No corrections
8
9 _____ Corrections per attached
10
11 _____
12 DR. PAUL C. CLARK
13
14
15 ( ) Reading and signing was requested.
16 ( ) Reading and signing was waived.
17 (X) Reading and signing was not requested.
18
19 Should the signature of the witness not
20 be affixed to the deposition, the witness shall not
21 have availed himself of the opportunity to sign or
22 the signature has been waived.
23
24 --oOo--
25

1 ERRATA SHEET

2 NAME OF CASE: Datavant, Inc. v. Vigilytics

3 LLC

4 DATE OF DEPOSITION: November 8, 2024

5 NAME OF WITNESS: DR. PAUL C. CLARK

6 Reason Codes:

7 1: To clarify the record.

8 2: To conform to the facts.

9 3: To correct transcription error.

10 Page _____ Line _____ Reason _____

11 From _____ to _____

12 Page _____ Line _____ Reason _____

13 From _____ to _____

14 Page _____ Line _____ Reason _____

15 From _____ to _____

16 Page _____ Line _____ Reason _____

17 From _____ to _____

18 Page _____ Line _____ Reason _____

19 From _____ to _____

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21 From _____ to _____

22 Page _____ Line _____ Reason _____

23 From _____ to _____

24

25 _____ _____

DR. PAUL C. CLARK DATE

1 DECLARATION UNDER PENALTY OF PERJURY
2 I am the witness in the foregoing
3 deposition.
4 I have read the foregoing deposition or
5 have had read to me the foregoing deposition, and
6 having made such changes and corrections as I
7 desired, I certify that the same is true in my own
8 knowledge.
9 I hereby declare under penalty of perjury
10 that the foregoing is true and correct.
11 In witness whereof, I hereby subscribe my
12 name this _____ day of _____, 2024.
13
14 _____
15 DR. PAUL C. CLARK
16
17
18
19
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21
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23
24
25

1 CERTIFICATE

2 I, SUSAN ASHE, a Registered Merit
3 Reporter and Notary Public, hereby certify that the
4 foregoing is a true and accurate transcript of the
5 deposition of said witness, who was first duly sworn
6 by me on the date and place hereinbefore set forth.
7 I FURTHER CERTIFY that I am neither
8 attorney nor counsel, nor related to or employed by
9 any of the parties to the action in which this
10 deposition was taken, and further that I am not a
11 relative or employee of any attorney or counsel
12 employed in this action, nor am I financially
13 interested in this case.
14 I FURTHER CERTIFY that I was situated in
15 Charlottesville, Virginia while performing eNotary
16 services remotely.
17 Dated this 9th day of November 2024.
18
19
20 _____
21 Susan Ashe, Notary Public
22 for the Commonwealth of Virginia
23
24 My commission expires: January 31, 2027.
25 Notary Registration Number: 100809.

Exhibits

Clark (previously marked E xhibit 1001)
4:12 23:22,23

Clark (previously marked E xhibit 1005)
4:11 21:20 22:1

Clark (previously marked E xhibit 1009)
4:10 7:4,5

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5:3

0

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