18-1586

**UNITED STATES COURT OF APPEALS**
**FOR THE FEDERAL CIRCUIT**

In re Intelligent Medical Objects, Inc.

*Appellant*

APPEAL FROM THE DECISION OF THE PATENT TRIAL AND APPEAL BOARD OF THE UNITED STATES PATENT AND TRADEMARK OFFICE IN EX PARTE NAEYMI-RAD ET AL. APPEAL 2016-005478, REGARDING U.S. PATENT APPLICATION SER. NO. 13/622,934 FILED ON SEPTEMBER 19, 2012.

# CORRECTED BRIEF OF APPELLANT INTELLIGENT MEDICAL OBJECTS, INC.

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May 30, 2018

## CERTIFICATE OF INTEREST

Counsel for the Appellant, Intelligent Medical Objects, Inc. (IMO), certifies the following:

1. The full name of the party being represented by me is: Intelligent Medical Objects, Inc.

2. The name of the real party in interest represented by me is: Intelligent Medical Objects, Inc.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party represented by me is:

A. IMO Parent, Inc.

B. IMO Investor Holdings, Inc.

4. The names of all law firms and the partners or associates who appeared for Intelligent Medical Objects, Inc. in proceedings before the United States Patent Office, or are expected to appear in this Court, are:

Beem Patent Law Firm
Richard P. Beem
Raymond R. Ricordati, III
John R Linzer

5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal:

None

Date: May 30, 2018

By: /s/ Richard P. Beem
Richard P. Beem

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## STATEMENT OF RELATED CASES

Pursuant to Federal Circuit Rule 47.5, appellant states as follows:

(a) There have been no previous appeals in this case.

(b) Counsel is unaware of any pending case that will directly affect or be directly affected by the Court's decision in this case.

## JURISDICTIONAL STATEMENT

This Court has jurisdiction over Intelligent Medical Object's (IMO's) appeal of the Patent Trial and Appeal Board's (Board's) December 22, 2017 final decision (Appx0001-0016) pursuant to 28 U.S.C. §1295(a)(4)(A). IMO filed a timely notice of appeal on February 15, 2018.

## STATEMENT OF THE ISSUE PRESENTED

Whether the Board erred as a matter of law in distilling novel, non-obvious, electronic medical record (EMR) method claims into a Section 101 ineligible system of "collecting, storing and organizing data" and shifting the burden to IMO to establish non-conventionality of the claimed invention.

## STATEMENT OF THE CASE

U.S. Patent Application 13/622,934 (the '934 application), the only member of its family not yet issued as a patent, was filed on September 19, 2012. Appx0099. Following a series of Office Actions and responses, the pending claims were deemed to be novel and non-obvious over the prior art, but were finally rejected as allegedly being directed to non-eligible subject matter under Section 101. Appx0479 (Office Action dated March 13, 2015) ("Claims 1-14 . . . appear allowable if rewritten to overcome the 35 U.S.C. 101 issues"). IMO appealed, and the Board upheld the rejection. Appx0001-0016.

## STATEMENT OF FACTS

### A. IMO harnesses computer technology to manage electronic medical records (EMR)

Intelligent Medical Objects, Inc. (IMO) is the world's leading provider of medical vocabulary software applications that allow doctors to capture and preserve truth (or clinical intent) at the point of care. *See* Appx0253-0254 (Spec. at ¶¶10-25) ("capturing the complete depth of information contained within data").

The IMO "controlled" medical vocabulary includes over 6 million terms that, in turn, map to numerous code sets, including the claimed "administrative terminology" (*e.g.*, 68,000 ICD-10-CM billing codes) and "reference terminology" (*e.g.*, 300,000 SNOMED clinical decision support codes), where those code sets are used as inputs by multiple software applications. Appx0254; Appx0267-0268 (Spec. at ¶¶ 15, 122-29).[1] Those external mappings have been proved to have 99% accuracy in a peer-reviewed study published by the U.S. Centers for Disease Control and Prevention (CDC). Appx0630.

The increased granularity that results from IMO's controlled vocabulary and its mappings to those terminologies permits the capture of greater meaning while

[1] Citations to the specification of the '934 application refer to paragraph numbers in the clean version of the substitute specification filed on November 28, 2012 (Appx0251-0291) and drawings as originally submitted (Appx0153-0198). The file history can be found at Appx0021-0651. Citations in the Board's decision refer to paragraph numbers in the published application.

increasing complexity of the underlying data architecture. Appx0252; Appx0254; Appx0267-0268; Appx0273 (Spec. at ¶¶ 10, 15, 122-29, 177). Medical data is exponentially more complicated than other types of data because it involves many-to-many relationships. Appx0261 (Spec at ¶ 63). For example, there are many patients, doctors, diagnoses, procedures, and prescriptions. Appx0255-0257 (Spec. at ¶17-21). Many-to-many relationships defy traditional relational databases. Appx0263 (Spec. at ¶ 77). They are best accommodated with graph structures, but graphs bog down quickly as additional data is added, for example, as medical treatment progresses over time and as more patients and more doctors are added into the system. Appx0270-0272 (Spec. at ¶¶156, 170-74); Appx0881 (U.S. Patent 7,693,917 at 1:36-2:3); Appx0883-0884 (U.S. Patent 7,693,917 at 5:51-7:3).

**B. Prior EMR systems had technical problems**

The background of U.S. Patent Application 13/622,934 (the ’934 application) explains that a typical workflow for patient care may be defined by a series of visits in which the patient is analyzed subjectively (patient history) and objectively (physical exam), the patient’s condition is assessed, and a treatment plan is created (referred to as SOAP). Appx0262 (Spec. at ¶ 76).

Existing systems relied on standard relational database models and were either incapable of dealing with follow-up visits or failed to recognize them altogether. Appx0263 (Spec. at ¶ 77). On the other hand, directed graphs are

inherently difficult to use, as explained at length in IMO's '934 application and U.S. Patent 7,693,917 (the '917 patent), incorporated by reference. Appx0270-0272 (Spec. at ¶¶156, 170-74); Appx0864-0911; Appx0881 ('917 patent at 1:36-2:3); Appx0883-0884 ('917 patent at 5:51-7:3). Relationships among the patient's conditions, assessments and treatments over time were lost and inaccuracies were introduced, requiring expensive, time-consuming, haphazard data cleansing to fix. Appx0263; Appx0273 (Spec. at ¶ 77, 177).

### C. IMO developed and claimed technical solutions

To address these problems, IMO developed unique methods of implementing longitudinal electronic medical records (LEMR) that store patient information properly over time. Appx0251-0252 (Spec. at ¶¶ 3-7). The '934 application, entitled "Method for Implementing a Controlled Medical Vocabulary," describes and claims a longitudinal electronic medical record (LEMR) that properly tracks relationships among data elements generated at multiple points in time (Appx0252-0253 (Spec. at ¶¶ 10-12)) and in which a controlled medical vocabulary is implemented to ensure data normalization (accuracy) while maintaining clinical intent (Appx0273 (Spec. at ¶ 177)).

The '934 application includes two independent claims, claim 1 and claim 12.[2] The Patent Office has deemed both claims novel and non-obvious; eligibility

[2] A complete list of pending claims is included in the Appendix at Appx0528-0530.

is the sole issue on appeal. Appx0479 (Office Action dated March 13, 2015).

### 1. Claim 1 recites a specific method for tagging data in a technically efficient LEMR with a controlled medical vocabulary

Claim 1 recites and is explained in plain English as follows:

| Claim 1 of the '934 application | Plain English |
|---|---|
| 1. A method of implementing a controlled vocabulary in a longitudinal electronic medical record, comprising: | LEMR with vocabulary tagging by: |
| generating a first instance of a plurality of data objects during a first encounter, said plurality of data objects comprising data elements further comprising a first instance identifier and temporal identifiers; | generating data from a patient's first visit with a doctor |
| linking a data object in said first instance to a summarization reference with a pointer, where the plurality of data objects and the summarization reference are related as part of a directed graph data structure; | creating a directed graph by linking visit-level data with summary references with pointers |
| creating an additional instance of a plurality of data objects during a later encounter, said additional instance of a plurality of data objects comprising data elements further comprising an additional instance identifier and temporal identifier; | generating data from the patient's second visit with a doctor, |
| providing continuity for said plurality of data objects of said first instance over time; | linking relevant data from first visit and second visits, and updating summaries |
| capturing said controlled vocabulary using a computer by forming a list of medical terms and list of associated descriptions; | IMO's 6 million terms |
| creating a list of codes internal to said controlled vocabulary; | codes for each of IMO's 6 million terms |
| storing said codes, said medical terms, and said descriptions using a computer in a format suitable for use in the longitudinal electronic medical record; and | storing the codes for IMO's 6 million terms in proper format |

| Claim 1 of the '934 application | Plain English |
|---|---|
| tagging elements within a domain within the longitudinal medical record with said controlled vocabulary; | tagging data from each visit with codes for IMO's terms (preserving semantic meaning by not changing underlying data) |
| wherein said controlled vocabulary maps to at least one of a reference terminology or an administrative terminology; and | mapping codes to other terminologies, such as ICD or SNOMED |
| wherein said providing step comprises tracking a relationship between said data object of said first instance and a data object of said additional instance. | linking data from first and second visits for tracking data and revisions |

Thus, the method recited in claim 1 generates instance data at multiple visits and links the data across visits, maintaining data continuity and revision history, reducing the need for data cleansing and the need to store duplicative data objects. Appx0252-0253; Appx0256-0257; Appx0263; Appx0274-0278; Appx0160-0162 (Spec. at ¶¶ 11-12, 20, 28, 77, 202-243 and Figures 8-10). This method also increases flexibility because it allows data objects to be "polymorphic," meaning those data objects can be processed differently or assigned to different data types in different contexts. Appx0256 (Spec. at ¶ 20).

By linking visit-level data objects to summarization references using pointers, the system increases speed and efficiency of processing records by quickly displaying the current state of the patient and alleviating the need to store duplicative data objects in separate summary objects. Appx0263; Appx0274-0278; Appx0160-0162 (Spec. at ¶¶ 78, 212, 202-243 and Figures 8-10).

By tagging data objects with a controlled medical vocabulary rather than

changing underlying data, data normalization and interoperability are increased, reducing or eliminating the need for data cleansing, which improves efficiency and accuracy in processing records and connecting to other providers' systems. Appx0252; Appx0254; Appx0267-0268; Appx0273 (Spec. at ¶¶ 10, 15, 122-29, 177).

### 2. For example, asthma is treated, and data is collected, in multiple visits

The example described in paragraphs 202-243 of the specification and illustrated in Figures 8-10 highlights technical aspects and benefits of the claimed solutions. Appx0274-0278; Appx0160-0162. Patient and relationship data are collected and updated over the course of three patient visits relating to an asthma problem. Appx0274 (Spec. at ¶ 204). The data collection and linking processes recited in the claim will now be explained in the context of the first two visits, as shown in Figures 8 and 9, reproduced below.

During the first visit, a new medical record and an instance (visit) record are created (as recited in claim 1). Appx0160; Appx0275 (Spec. at Figure 8 and ¶ 206). The visit data also is linked to a summarization reference data objects using pointers, rather than storing the data again in a separate summarization reference. Appx0275 (Spec. at ¶ 212). The patient and relationship data are shown in Figure 8, reproduced here:

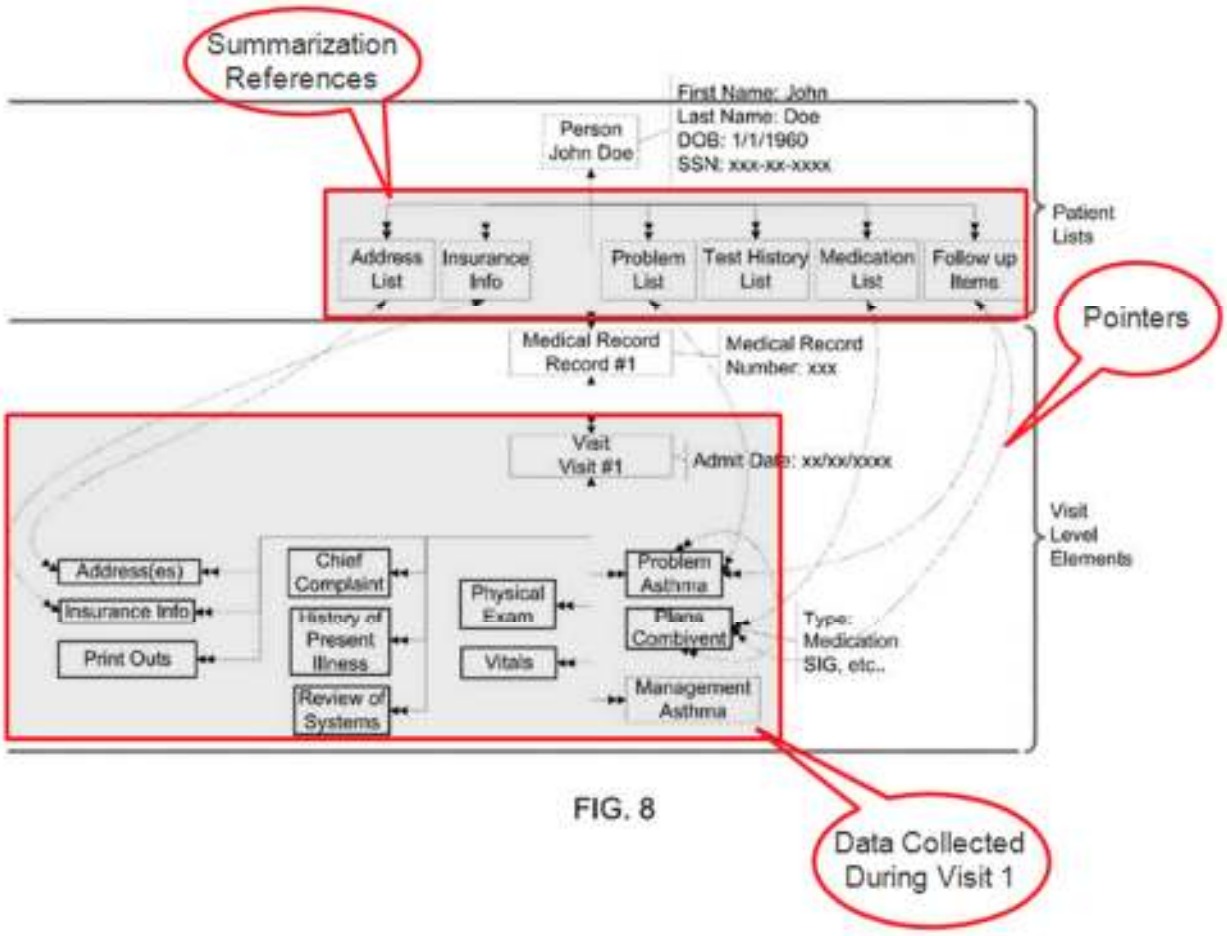


FIG. 8

Appx0160. Thus, Figure 8 shows data collected during a first visit and the generation of summarization reference data objects and pointers to the underlying visit data.

During the second visit, new instance (visit) information is created (as recited in claim 1), and relationships among the data are updated (also recited in claim 1). Appx0161; Appx0276 (Spec. at Figure 9, reproduced below, and ¶¶ 225-227). Because the data is linked over time, the health care provider need only collect and update certain data elements, such as known follow-up items; the system re-uses as many of the previously stored data items as appropriate.

Appx0276-0277 (Spec. at ¶¶ 221-235). In the illustrated example, because the problem and medication information has changed, the provider need only create these new items, which are automatically linked to the previous data from the first visit by pointers. Appx0276 (Spec. at ¶ 227). The new data and the links amongst the data are shown in Figure 9, reproduced here:

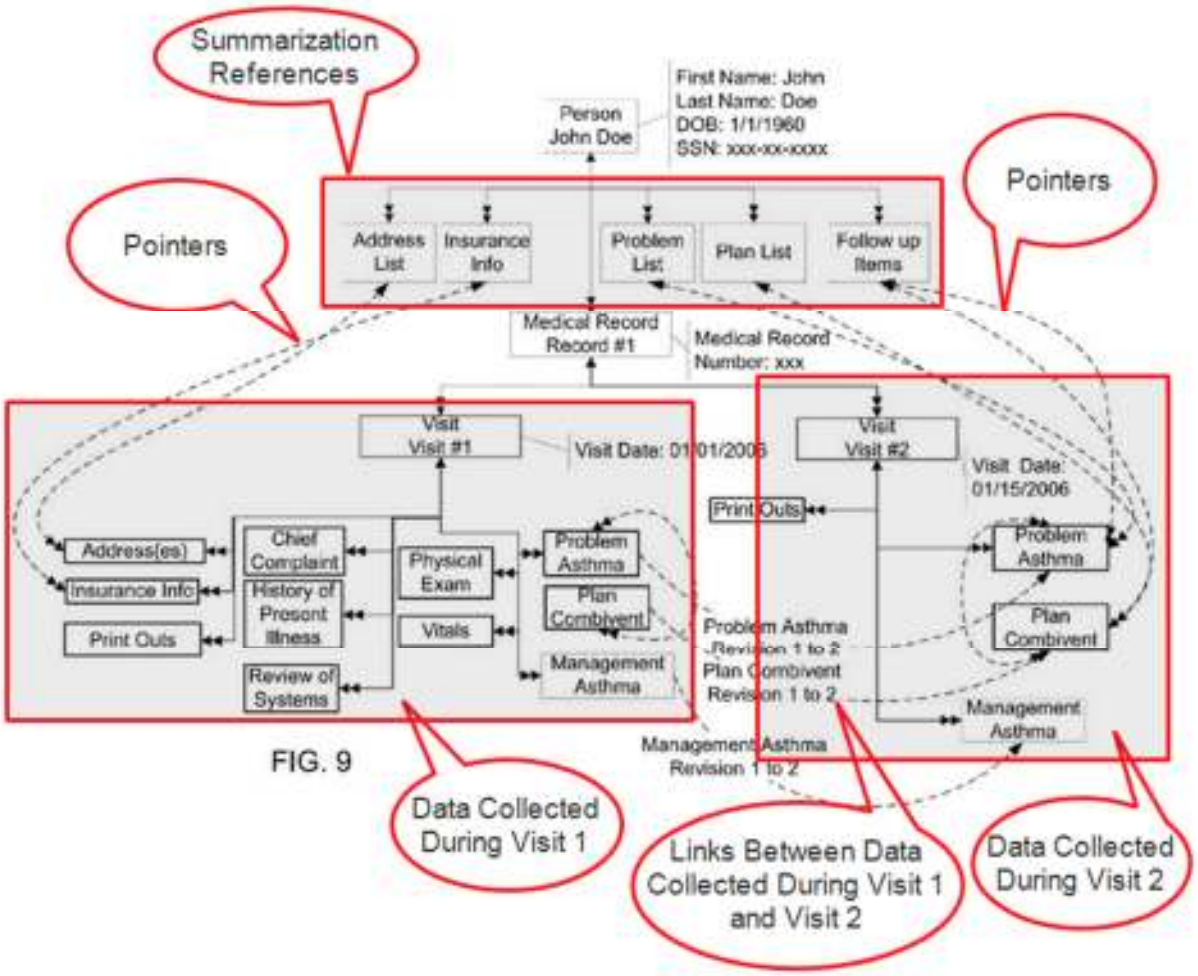


FIG. 9

Appx0161. Thus, Figure 9 shows data collected during a second visit, links created between data from the first and second visits with pointers, and updates to the summarization references, which now include pointers to data from the first two

visits. Appx0276-0277 (Spec. at ¶¶ 221-35).

A third visit is shown in Figure 10 and described in accompanying text. Appx0162; Appx0277-0278 (Spec at ¶¶ 236-43). Following the third visit, links and pointers between data from each of the three visits and the summarization references are updated accordingly. *Id*. Multiply the visits several-fold and the number of patients and providers by thousands, and one begins to see the true technical prowess of the claimed invention.

One or more of these data items may be tagged with IMO's vocabulary (recited in claims 1 and 12), as shown in Figure 3. Appx0155. In addition, technical details about an exemplary directed graph structure (as recited in claims 1 and 12) are shown in Figures 11-14EE and the accompanying description in the specification. Appx0163-0198; Appx0280-0291 (Spec. at Figures 11-14EE and ¶¶ 267-576). As noted above, these technologies increase data normalization and interoperability, reducing or eliminating the need for data cleansing, which improves efficiency and accuracy in processing records and connecting to other providers' systems. Appx0252; Appx0254; Appx0267-0268; Appx0273 (Spec. at ¶¶ 10, 15, 122-29, 177).

### 3. Claim 12 recites a specific method for tagging sound wave dictation files with a source vocabulary

Claim 12 recites and is explained in plain English as follows:

| Claim 12 of the '934 application | Plain English |
|---|---|
| 12. A method of processing a sound wave and correlating it with a source vocabulary, comprising: | Processing dictation with vocabulary tagging by: |
| capturing, using a computer, a sound wave as an electronic file; | capturing dictation data from a doctor |
| translating, using a computer, said electronic file into text; | translating the dictation data to a text file |
| storing said text as a patient medical record using a computer with directed graph database storage; | storing the text along with other patient data in a directed graph structure |
| tagging said patient medical record with a source vocabulary; | tagging the data with IMO's 6 million terms |
| mapping said source vocabulary to at least one of a reference terminology or an administrative terminology; and | mapping codes for IMO's 6 million terms to other terminologies such as ICD or SNOMED codes |
| providing a code internal to said source vocabulary. | codes for each of IMO's 6 million terms |

Similar to claim 1, claim 12 includes the step of tagging data with a source vocabulary (corresponding to the "controlled vocabulary" of claim 1) and further requires mapping the source vocabulary to at least one of a "reference terminology" or an "administrative terminology." As a result, the method as recited in claim 12 achieves similar benefits with regard to data normalization, data cleansing, data interoperability and the efficiency and accuracy of medical record processing. Appx0252; Appx0254; Appx0267-0268; Appx0273 (Spec. at ¶¶ 10, 15, 122-29, 177). Additionally, both methods facilitate the interoperability of

multiple software applications that require different coded data as functional inputs. Appx0252 (Spec. at ¶ 10).

Claim 12 further relates to a computer-centric problem, *i.e.*, how to accurately translate data contained in electronic dictation files into an EMR, while at the same time retaining the semantic meaning associated with the specific phraseology used by the clinician when generating the dictation files. Appx0270 (Spec. at ¶0154).

## SUMMARY OF THE ARGUMENT

The Board erred as a matter of law in distilling novel, non-obvious, electronic medical record (EMR) method claims into a Section 101 ineligible system of "collecting, storing and organizing data" and shifting the burden to IMO to establish non-conventionality of the claimed invention.

## STANDARD OF REVIEW

A patent's subject-matter eligibility under 35 U.S.C. § 101 is a question of law reviewed de novo. *In re Smith*, 815 F.3d 816, 818 (Fed. Cir. 2016). This determination may rest on certain findings of fact, which must be established by clear and convincing evidence and which are reviewed for clear error. *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

## ARGUMENT

The Board erred as a matter of law by ignoring the limitations of the admittedly novel and non-obvious '934 claims (deemed "allowable" but for Section 101 rejection). Appx0479. The '934 claims are not directed to just *any* way of "collecting, storing, and organizing data" (Appx0007), but to a specific "method of implementing a controlled vocabulary in a longitudinal electronic medical record" that manages data generated at different times (claim 1), uniquely links the data to each other and to a summarization reference in a directed graph structure (claim 1), measures real-world voice data (claim 12), and efficiently tags the data with medical vocabularies (claims 1 and 12).

Under step one of *Alice*, the Board's decision to oversimplify the claims, discussed in Section A, *infra*, flies in the face of the Supreme Court's warning to avoid successively higher levels of abstraction. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l,* 134 S.Ct. 2347, 2354 (2014) *citing Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71-73 (2012). It also squarely conflicts with this Court's holdings that specific implementations that improve the functionality of the computer are eligible under *Alice* step one. *See, e.g., Enfish LLC v. Microsoft Corp.,* 822 F.3d 1327, 1336-39 (Fed. Cir. 2016) (claims reciting self-referential database eligible under *Alice* step one) *and Core Wireless Licensing S.A.R.L. v. LG Elecs. Inc.,* 880 F.3d 1356, 1361-63 (Fed. Cir. 2018) (claims for improved menu

interface eligible under *Alice* step one).

If the Court finds it necessary to consider *Alice* step two, "significantly more" is detailed in the claims to render them eligible. *DDR Holdings, LLC v. Hotels.com*, 773 F.3d 1245, 1255 (Fed. Cir. 2014) (claim limitations must be viewed individually and as ordered combination; additional elements transform claim into eligible application of abstract idea).

Here, the Patent Office has already found these claimed technologies eligible on *five* separate occasions—*three* which recited the identical (or nearly identical) method of establishing an LEMR recited in claim 1—as explained below in Section A(3). *See, e.g.,* Appx1158-1225 and 1248-1289 (allowing claims of and issued patents from co-owned applications with identical limitations post-*Alice*).

As in those issued patents, the *Mayo/Alice* requirements are satisfied here because the details recited in both claims 1 and 12 provide technical solutions to technical problems, alleviating the need to store duplicative data objects, increasing the speed, efficiency and accuracy of processing the records, and reducing the need for data cleansing, among other technical benefits. These improvements render the claims eligible for patent. *See, e.g., DDR*, 773 F.3d at 1255-59 (claims for generating composite web page that combines visual elements of host website with content of third-party merchant eligible under *Alice* step two); *Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1352

(Fed. Cir. 2016) (claims for user-specific filtering system using server-level software eligible under *Alice* step two).

In ignoring these benefits, the Board accepted the examiner's unsupported assertion that novel and non-obvious claims employ merely "conventional" technologies to perform "routine" computer functions. Appx0011; Appx0479-0481. An allegation that a claimed technology is "well-understood, routine and conventional" raises a question of fact that the Patent Office must prove by clear and convincing evidence. *Berkheimer,* 881 F.3d at 1368-69. The Board's decision turned this standard on its head when it found the claims ineligible because IMO "do[es] not show how the claims are technically performed such that they are not routine, conventional functions of a computer." Appx0015. This was reversible error: the burden was on the Office to prove conventionality with evidence.

### A. Claims 1 and 12 are directed to eligible subject matter (*Alice* step one)

Independent claims 1 and 12 recite distinct sets of limitations and are presented separately on appeal. Each is directed to patentable subject matter, and therefore passes *Alice* step one, because each recites concrete technical details, not high level generalities. *Enfish*, 822 F.3d at 1335 (court cannot simply ask whether claims *involve* ineligible concept, because essentially every claim *involves* law of nature or natural phenomenon) (emphasis added). Here, the claims are eligible because they include specific ways of efficiently storing an LEMR (claim 1),

uniquely linking data generated at multiple times to each other and to summarization references (claim 1), measuring real-world voice data (claim 12), and efficiently tagging the information with medical vocabularies (claims 1 and 12). *Id*. at 1335 (claims not abstract under *Alice* step one because of specific improvement in computer capabilities).

### 1. The Board oversimplifies the claims

The Board misapplied the first step of *Alice*, because it avoided the specific language of the claims to justify an improperly founded rejection. *See McRO, Inc. v. Bandai Namco Games Am., Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016) (reversing ineligibility finding where claims were oversimplified); *Alice*, 134 S.Ct. at 2354 ("tread carefully in construing this exclusionary principle lest it swallow all of patent law").

The Board pays only lip service to details recited in the claims, generalizing them as "directed to processing information to create a longitudinal medical record, and thereby manage patient records" before immediately restating them at an even higher level of generality as merely "collecting, storing, and organizing data." Appx0007. In so doing, the Board ignores the substance of the claims. *Enfish*, 822 F.3d at 1337 ("describing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule"). This was reversible error.

### 2. The claims recite concrete details

Claims 1 and 12, when viewed as a whole, recite meaningful details that render them eligible.

Merely "storing" information is not enough. *Intellectual Ventures I LLC v. Capital One Bank (USA),* 792 F.3d 1363, 1367-69 (Fed. Cir. 2015) (ineligible claims used generic computer components to perform financial budgeting); *In re Salwan*, No. 16-2079, slip op. at pp. 5-7 (Fed. Cir. March 13, 2017) (nonprec.) (attached as Appx1256-1263) (ineligible claims recited generic structures for storing electronic medical record). But storing information in *specific* ways is sufficient. *Enfish*, 822 F.3d at 1339 (claims reciting self-referential database model are eligible); *Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1259-60 (Fed. Cir. 2017) (claims for enhanced computer memory are eligible).

Merely using a computer to process information is not enough. *buySAFE, Inc. v. Google, Inc.,* 765 F.3d 1350, 1354-55 (Fed. Cir. 2014) (ineligible claims used computer to process formation of contractual relationship); *SAP Amer., Inc. v. InvestPic, LLC*, No. 17-2081, slip op. at p. 11 (Fed. Cir. May 15, 2018) (ineligible claims to improved mathematical analysis used generic computer as tool to perform calculation). But processing the information in a *particular* way is sufficient. *McRO*, 837 F.3d at 1313-1316 (claims reciting rules for automating 3-D facial animations are eligible).

### a. Claims 1 and 12 improve computer functionality

Claim 1 recites a particular way to manage an LEMR by generating instance data at multiple visits and linking the data across visits, which maintains data continuity and revision history and reduces the need for data cleansing and the need to store duplicative data objects. Appx0252-0253; Appx0256-0257; Appx0263; Appx0273-0278; Appx0160-0162 (Spec. at ¶¶ 11-12, 20, 28, 77, 177, 202-243 and Figures 8-10). This increases flexibility because it allows data objects to be polymorphic so that the same data item can be assigned different meanings over time. Appx0256 (Spec. at ¶ 20).

In this respect, the claims are eligible for the same reasons as those in *Enfish*, which recited a specific logical model of storing, organizing, and accessing information in a database using a self-referential table. *Enfish*, 822 F.3d at 1330. In reversing the district court, this Court noted that "the claims are not simply directed to *any* form of storing tabular data, but instead are specifically directed to a *self-referential* table for a computer database." *Id*. at 1337 (emphasis in original). This Court explained that "the self-referential table recited in the claims . . . is a specific type of data structure designed to improve the way a computer stores and retrieves data in memory." *Id.* at 1339. Because claim 1 recites a specific way to manage an LEMR to achieve similar improvements in the way a computer stores and retrieves data, such as by generating instance data at multiple

visits and linking the data across visits using pointers, claim 1 is eligible.

Claim 1 also recites a specific way to link the visit-level data objects to summarization references using pointers, which increases speed and efficiency in processing records by quickly displaying the current state of the patient and alleviates the need to store duplicative data objects in separate summary objects. Appx0263; Appx0274-0278; Appx0160-0162 (Spec. at ¶¶ 77-78, 212, 202-243 and Figures 8-10). These technical improvements also render claim 1 eligible.

Both claims 1 and 12 recite specific ways of tagging stored data objects with vocabularies, such as by establishing a two-tiered vocabulary of terms and descriptions that map to internal codes that in turn map to external terminologies for billing or reference purposes as recited in claim 1 and by similarly using a vocabulary that maps to internal codes that in turn map to external terminologies as recited in claim 12. These specific methodologies increase data normalization and data interoperability and reduce or eliminate the need for time-consuming and resource-intensive data cleansing, which improves efficiency and accuracy in processing records. Appx0252; Appx0254; Appx0267-0268; Appx0273 (Spec. at ¶¶ 10, 15, 122-29, 177).

As such, these limitations are similar to those in *McRO*, which related to a rules-based approach to automate 3-D facial animations. Reiterating its warnings against oversimplification, the Court noted that the claim language set forth

meaningful requirements for specific animation rules. *McRO*, 837 F.3d at 1313. Because specific rules were recited—not merely use of a computer—and those rules contributed to improvement of the 3-D animation process, the claims were eligible. *Id.* at 1314. Like the claims in *McRo*, claims 1 and 12 are eligible because they recite specific mechanisms for managing an LEMR with vocabulary tagging that improve the computer's ability to process records. *Id.; accord Core Wireless,* 880 F.3d at 1361-63 (claims for specific improvement to menu interface that allowed faster application launching were eligible under step one of *Alice)*. Traditional databases were not well-suited for these tasks. Appx0263 (Spec. at ¶ 77).

**b. Claim 12 also transforms real-world data**

Additionally, by measuring real-world sound files and tagging the data with a medical vocabulary, claim 12 is similar to those found eligible in *Thales Visionix Inc. v. U.S.*, 850 F.3d 1343, 1345-49 (Fed. Cir. 2017) (method for determining position of object using real-world sensors is eligible). Like the method in *Thales*, the specific recitation of limitations that improve processing data from real-world sensors renders claim 12 eligible.

### c. Claims 1 and 12 do not preempt healthcare

The Patent Office turned IMO's claims into clichés of "providing healthcare" and "generating and processing medical records." Appx0445; Appx0479.

In so doing, the Board cited with approval the examiner's findings that the claims are for "a method of organizing human activities; a fundamental economic practice; using categories to organize, store, and transmit information; comparing new and stored information; and/or comparing data using mathematical relationships/formulas." Appx0005.

None of these broad strokes are true. The claims do not seek to tie up the idea of "providing healthcare." The issuance of claims 1 and 12 will not prevent doctors from performing surgeries, diagnosing medical problems, prescribing medications, or the like. Moreover, others will be free to store and manage health care records in myriad ways. The claims are not preemptive under *Alice.* 134 S.Ct. at 2354-55 (claims that "pose no comparative risk of pre-emption" are eligible).

The '934 claims are like those found eligible in the cases cited above. The claims are not directed to just *any* method of storing an EMR, but specific ways of efficiently storing an LEMR (claim 1), uniquely linking data generated at multiple times to each other and to summarization references (claim 1), measuring real-world voice data (claim 12), and efficiently tagging the information with medical

vocabularies (claims 1 and 12). As a result, the operation of the computer is improved by alleviating the need to store duplicative data objects, increasing the speed and efficiency of processing records, reducing the need for data cleansing, and increasing interoperability among various providers, among other benefits. The Board must be reversed.

#### 3. These specific limitations repeatedly have been deemed eligible by the Patent Office

The same or similar LEMR limitations recited in claim 1 have been deemed eligible by the Patent Office in three patents issued to IMO post-*Mayo*. Appx0954-1137; *See Voter Verified, Inc. v. Election Systems & Software LLC*, 887 F.3d 1376, 1382 (Fed. Cir. 2018) (*Alice* did not alter law of § 101 but applied two-step framework of *Mayo*). Two more patents with identical LEMR limitations also issued post-*Alice*. Appx1163-1225, 1264-1289.

##### a. The Patent Office agreed post-*Mayo* that the LEMR limitations are eligible in the parent application

The ’934 application claims the benefit of U.S. Patent Application 11/858,241, (the ’241 application), which issued as U.S. Patent 8,589,400 (Group Art Unit 2167; Class 707/738) (the ’400 patent) on November 19, 2013, *i.e.*, after the Supreme Court’s decision in *Mayo*, 566 U.S. 66 (2012). Appx0954-1013. Like the pending claims, claim 1 of the ’400 patent recites a detailed method for managing an LEMR. Appx1013.

As shown in the following side-by-side comparison of the claims, each limitation in the body of eligible and issued claim 1 of the ’400 patent is found in pending claim 1 of the ’934 application:

| **Claim 1 of the ’400 patent** | **Claim 1 of the ’934 application** |
|---|---|
| 1. A method for keeping, organizing and managing electronic records on at least one computer, comprising: | 1. A method of implementing a controlled vocabulary in a longitudinal electronic medical record, comprising: |
| generating a first instance of a plurality of data objects during a first encounter, said plurality of data objects comprising data elements further comprising a first instance identifier and temporal identifiers; | generating a first instance of a plurality of data objects during a first encounter, said plurality of data objects comprising data elements further comprising a first instance identifier and temporal identifiers; |
| linking a data object in said first instance to a summarization reference with a pointer, where the plurality of data objects and the summarization reference are related as part of a directed graph data structure; | linking a data object in said first instance to a summarization reference with a pointer, where the plurality of data objects and the summarization reference are related as part of a directed graph data structure; |
| creating an additional instance of a plurality of data objects during a later encounter, said additional instance of a plurality of data objects comprising data elements further comprising an additional instance identifier and temporal identifier; and | creating an additional instance of a plurality of data objects during a later encounter, said additional instance of a plurality of data objects comprising data elements further comprising an additional instance identifier and temporal identifier; |
| providing continuity for said plurality of data objects of said first instance over time, | providing continuity for said plurality of data objects of said first instance over time; |
| | capturing said controlled vocabulary using a computer by forming a list of medical terms and list of associated descriptions; |
| | creating a list of codes internal to said controlled vocabulary; |

| Claim 1 of the ’400 patent | Claim 1 of the ’934 application |
|---|---|
| | storing said codes, said medical terms, and said descriptions using a computer in a format suitable for use in the longitudinal electronic medical record; and |
| | tagging elements within a domain within the longitudinal medical record with said controlled vocabulary; |
| | wherein said controlled vocabulary maps to at least one of a reference terminology or an administrative terminology; and |
| wherein said providing step comprises tracking a relationship between said data object of said first instance and a data object of said additional instance. | wherein said providing step comprises tracking a relationship between said data object of said first instance and a data object of said additional instance. |

Appx1013 (claim 1 of the ’400 patent). As shown above, claim 1 of the ’934 application is even more specific than issued claim 1 of the ’400 patent. At the very least, because it includes each limitation of an LEMR recited in eligible claim 1 of the issued ’400 patent, pending claim 1 also should be deemed eligible. *Id*.

Even assuming *arguendo* the technical details regarding the controlled medical vocabulary are abstract in isolation (they are not), their inclusion *in addition to* the LEMR limitations of pending claim 1 cannot dissolve the eligibility of those limitations and, by extension, the claim as a whole.

### b. The Patent Office also agreed post-*Alice* that the LEMR limitations are eligible

Similarly, IMO's U.S. Patent 9,594,872 (the '872 patent) was issued[3] post-*Alice* and incorporates by reference the parent '241 application. Appx1264-1289. Following an appeal of a similar final rejection under Section 101, the examiner in that case re-opened prosecution and allowed the claims. Appx1253. In that case, the limitations of the '400 patent were added to the claims and were cited as a primary reason for allowance of the '872 patent. *Id*.

Specifically, the examiner stated:

> The primary reason for withdrawing the 101 rejection and allowing the claims is due to the fact that the pending claims recite a specific implementation for organizing concepts and descriptions that provide increased flexibility and robustness. *In addition, the claims provide more efficient storage and increased flexibility and usability by creating and maintaining a longitudinal electronic medical records* [sic]."

*Id*. (emphasis added). As in the '872 patent, the specific LEMR implementation details claimed in the instant application address the same technical issues identified by the Patent Office and provide the same technical solutions, rendering them eligible.

[3] The appeal and allowance of the '872 patent occurred after briefing to the Board and were presented at oral argument. Appx0618 ("We did file an appeal in one of the other cases and the examiner withdrew it from appeal, reopened prosecution, and as I say, it resulted in allowance . . .We already have at least two patents issued that we have included all of those limitations in this case.") The transcript can be found at Appx0614-0631.

### c. The other three patents in the family have all issued with similar claimed technologies

Three other patents issued following *Mayo* or *Alice* also claimed the benefit of the parent '241 application, recited similar subject matter, and were assigned to different art units by the Patent Office. Specifically, the following additional IMO patents were examined and issued under the current Section 101 framework:

- U.S. Patent 8,984,017 (Group Art Unit 2159; Class 707), issued March 17, 2015 (post-*Alice*) (reciting nearly identical, less detailed LEMR limitations) (Appx1163-1225);
- U.S. Patent 8,751,501 (Group Art Unit 2167; Class 707), issued June 10, 2014 (post-*Mayo*) (reciting linking data from multiple visits with pointers in a directed graph structure) (Appx1076-1137); and
- U.S. Patent 8,612,448 (Group Art Unit 2167; Class 707), issued December 17, 2013 (post-*Mayo*) (reciting summarization references including pointers to underlying data) (Appx1014-1075).

Each of these patents arises from the same specification, and they claim related subject matter; all were deemed eligible under the *Mayo/Alice* framework. *Voter Verified*, 887 F.3d at 1382 (*Alice* did not change *Mayo* framework).

One difference between the '934 application and the issued patents is that the '934 application was classified in class 705, Art Unit 3626. Appx0344. The Board has cited no authority elevating a clerical decision on classification into a

legal determination of ineligibility.

### B. Claims 1 And 12 recite additional elements that amount to significantly more than the alleged judicial exception (*Alice* step two)

Even if claims 1 and 12 are directed to judicial exceptions to patentability (they are not), the claims set forth meaningful limitations that transform any allegedly abstract idea into an eligible application. *Alice*, 134 S.Ct. at 2355, 60.

#### 1. The claims recite technical features, not high-level generalities

Claims 1 and 12 set forth specific, detailed steps and structures that define practical applications for implementing controlled vocabulary in a longitudinal electronic medical record (claim 1) and for processing a sound wave and correlating it with a source vocabulary (claim 12). IMO's claims specify details for generating instance data at multiple visits and then linking the data across visits and to summarization references with pointers (claim 1), obtaining real-world dictation/audio files (claim 12), and tagging the data objects with medical vocabularies (claims 1 and 12).

Each of these specific technical elements transform the alleged abstract idea into an eligible invention in step two of *Alice*, because they recite particular, useful applications that provide ways to improve the functionality of the computer. *McRO*, 837 F.3d at 1313-1316 (specificity in reciting way to achieve result transformed claim); *cf. Content Extraction and Transmission, LLC v. Wells Fargo Bank, N.A.*, 776 F.3d 1343, 1348 (Fed. Cir. 2014) (use of scanner to extract data

conceded to be "well-known" under *Mayo/Alice* step two); *Digitech Image Techs., LLC v. Elec. for Imaging, Inc.*, 758 F.3d 1344, 1349-51 (Fed. Cir. 2014) (generically combining two sets of data into stored user profile without reciting details that improve computer function).

Specifically, the limitations recited in claims 1 and 12 provide the following technical improvements. By generating instance data at multiple visits and linking the data across visits as recited in claim 1, data continuity and revision history is maintained, the need to cleanse data and store duplicative data objects is reduced, and data flexibility is increased. Appx0252-0253; Appx0256-0257; Appx0263; Appx0274-0278; Appx0160-0162 (Spec. at ¶¶ 11-12, 20, 28, 77, 202-243 and Figures 8-10). By linking the visit-level data objects to summarization references using pointers as recited in claim 1, speed and efficiency are increased and duplication is reduced. Appx0263; Appx0274-0278; Appx0160-0162 (Spec. at ¶¶ 77-78, 212, 202-243 and Figures 8-10). And by tagging the data objects—including dictation/audio files as recited in claim 12—with controlled or source vocabularies (rather than changing the underlying data) as recited in claims 1 and 12, data normalization and interoperability are increased, data cleansing is reduced or eliminated, and efficiency and accuracy in processing records and connecting to other providers' systems is increased. Appx0252; Appx0254; Appx0267-0268; Appx0273 (Spec. at ¶¶ 10, 15, 122-129, 177).

Thus, claims 1 and 12 recite solutions to technical problems that are "necessarily rooted" in computer technology and are analogous to the claims found eligible in *DDR Holdings, LLC v. Hotels.com*, 773 F.3d 1245, 1257-59 (Fed. Cir. 2014) (solving technical problems of retaining customers on website; brick-and-mortar stores did not suffer website redirection problems; claimed solution "necessarily rooted in computer technology" and therefore eligible) and *Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1352 (Fed. Cir. 2016) (internet filtering software that combined two prior art approaches in unique way held eligible under step two).

IMO's claims are eligible because they recite technologies and structures, *see DDR* and *Bascom*, that enable implementation of controlled vocabulary in LEMR (claims 1) and processing and correlating sound waves with a source vocabulary (claim 12) for which existing systems and standard relational databases were not well-suited. The recited technologies and structures are admitted to be novel and non-obvious (Appx0479), there is no evidence of conventionality or routineness, and they have already been deemed eligible many times by the Patent Office. *See* Section A(3) *supra*.

For at least these additional reasons, the claimed solutions are necessarily rooted in computer technology and solve problems specifically arising in the realm of computer record-keeping systems. As such, these claims recite significantly

more than an abstract idea and the rejections under Section 101 must be overturned.

### 2. The Board improperly shifted to IMO the burden to address "conventionality"

The Board's acceptance of allegedly "routine" and "conventional" knowledge (Appx0011) without proof is reversible error. *See Berkheimer v. HP Inc.*, 881 F.3d at 1368-70 (vacating district court finding that claimed features were "well-understood, routine and conventional" for lack of clear and convincing evidence); *see also* Appx1290-1315 (USPTO Memorandum entitled "Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*)," issued April 19, 2018, available at https://www.uspto.gov/sites/default/files/documents/memo-berkheimer-20180419.PDF and USPTO Training Materials entitled "Subject Matter Eligibility: Well-Understood, Routine, Conventional Activity," posted May 7, 2018, available at https://www.uspto.gov/sites/default/files/documents/berkheimer-training-20180427.pptx).

The Board's decision turned *Berkheimer's* clear and convincing evidence standard on its head. *Berkheimer*, 881 F.3d at 1368. Even though the examiner failed to present any evidence of conventionality—let alone clear and convincing evidence—the Board found the claims patent ineligible because IMO "do[es] not

show how the claims are technically performed such that they are not routine, conventional functions of a computer." Appx0015. This shift of the examiner's burden to IMO was reversible error.

The Board also overreached in citing *Intellectual Ventures I LLC v. Erie Indemnity Co.*, 850 F.3d 1315 (Fed. Cir. 2017) for the proposition that all pointers are "generic components . . . employed in a conventional manner." Appx0011. On the contrary, the holding there was limited to claims that did not recite the mechanism by which remote access was achieved by pointers. *Erie Indemnity*, 850 F.3d at 1331-32. In any event, pointers are but one feature recited in claim 1, and a holding of invalidity on the grounds that they allegedly are conventional fails to adhere to the requirement under step 2 that *all* claim elements be considered, both individually and as an ordered combination. *Alice,* 134 S.Ct. at 2355.

The Board also erred legally by claiming that IMO admitted the conventionality of directed graphs in the manner in which they are used in the pending claims. Appx0011. Actually, the Board mistakenly cited[4] to an explanation of the *problems* that can occur when using directed graphs—their complexity leads to performance and efficiency problems unless instance, *e.g.*, visit, data is handled properly—set out in the '934 application and IMO's U.S.

[4] Citations in the Board's decision are to paragraphs 187-88 in the published application, which correspond to paragraphs 170-71 of the Specification (Appx0272) as cited herein.

Patent 7,693,917, which is incorporated by reference. Appx0270-0272 (Spec. at ¶¶156, 170-74); Appx0881 ('917 patent at 1:36-2:3); Appx0883-0884 ('917 patent at 5:51-7:3). The pending claims recite specific limitations to do just that. In other words, when viewed in light of the specification, IMO's claims 1 and 12 recite the use of a directed graph data structure, not because such usage was well-understood, routine, or conventional, but in spite of the fact that its usage was considered to be problematic. Second, the single citation of IMO's '917 patent reference to directed graphs does not obviate the examiner's acknowledgement that the instant claims are novel and non-obvious, a holding that is unchallenged by the Board except through the backhanded acceptance of the "conventional" and "routine" rubric. *Berkheimer*, 881 F.3d at 1369 (single reference cannot establish well-understood, routine, and conventional nature of claim limitations).

Moreover, even if the Court were to find that the use of pointers and directed graphs, by themselves and in the abstract, represent well-understood, routine, and conventional activity, the ordered combinations of claims 1 and 12 integrate those components with other elements in a decidedly unconventional manner and recite the mechanisms by which computer-related improvements are obtained. *See Bascom*, 827 F.3d at 1349-52 (holding that even if all claim elements by themselves are well-understood, routine, and conventional, their ordered combination can represent a non-abstract inventive concept).

Here, the record is devoid of any evidence that pointers had been used either to link medical data objects generated at various points in time or to create summarization references of a patient's current state of health. Nor is there any doubt that these specific details result in improvements in data continuity and revision history (LEMR), increasing flexibility by enabling polymorphism (LEMR), reducing both the need for data cleansing (LEMR and vocabulary tagging) and storing of duplicative data objects (LEMR), increasing data interoperability (vocabulary tagging) and increasing the speed and efficiency of processing records (LEMR and vocabulary tagging). Appx0252-0254; Appx0256-0257; Appx0263; Appx0267-0268; Appx0273-0278; Appx0160-0162 (Spec. at ¶¶ 10-12, 15, 20, 28, 77-78, 122-129, 177, 202-243 and Figures 8-10).

### 3. The Board repeated its faulty step one reasoning instead of applying the proper test under step two

The Board improperly conflated the relevant inquires required under steps one and two of *Alice*. At step two, instead of "examining the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application," *Alice*, 134 S. Ct. at 2357, quoting *Mayo*, 566 U.S. at 72, 79, the Board simply repeated its faulty step one analysis. Appx0009-0010 ("Turning to step *two* of the analysis…the relevant question, even at the *first* step of the *Mayo/Alice* analysis, is 'whether the claims are directed to an improvement in computer functionality versus being directed to

an abstract idea.'") (emphasis added) (internal citations omitted).

Similarly, the precedent upon which the Board relied in its step two analysis discusses the step one inquiry. *See, e.g.,* Appx0010 (citing *Enfish's* step one analysis) *and* Appx0011-0013 (citing *Erie Indemnity's* step one analysis). Given the dearth of evidence of conventionality, it is of little surprise that the Board failed to engage in a meaningful analysis of the claims under of *Alice* step two.

#### 4. The Board disregarded as optional the Patent Office's own guidance and this Court's case law

The Board creates a troubling double standard in its loose analogies of abstract ideas to which IMO's pending claims are allegedly directed under *Alice* step one and its dismissive interpretation of this Court's findings of eligibility under *Alice* step two. On one hand, the Board ratifies the examiner's assertion that IMO's claims are directed to at least five articulations of abstract ideas that, as noted above in section A(3), fail to track the actual language of the claims. On the other hand, the Board completely disregards the Patent Office's own guidance (Appx1138-1157; Appx1226-1247) as merely "hypothetical 'examples [that] are intended to be illustrative only,'" even when those examples are explicit recitations of claims declared eligible by this Court. Appx0012-0013. In other words, the Board says it does not have to follow the Office's practices or this Court's precedent.

In treating Example 2 of the Guidance (Appx1141-1143) as optional, the

Board ignores this Court's holding in *DDR Holdings*. Appx0012. Giving short shrift to the Court's holding in *DDR*, the Board limits the relevance of the holding to claims reciting computer networking technologies. Appx0013 (brushing off IMO's claims because they allegedly "do not overcome any problem arising in the realm of computer networks"). As explained above, *DDR* establishes that any solution "rooted in computer technology," not only solutions rooted in computer networking, can be eligible. *DDR*, 773 F.3d at 1257-59. The Board's disregard of precedent should not be tolerated.

In short, IMO's claimed methods are eligible under *Alice* step one because they are directed to concrete, specific ways of improving the operation of a computer. They also are eligible under *Alice* step two because, when viewed individually and as an ordered combination, they recite significantly more than any allegedly abstract idea.

## CONCLUSION

For at least the foregoing reasons, the Court should reverse the Board decision.

Respectfully submitted,

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