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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ABHIJIT DHAKEPHALKAR, DAVID HAIMES,  
ARUNESH C. BANERJEE, ZEESHA CURRIMBHOY,  
ROBERT ZWIEBACH, and RONDY NG

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Appeal 2017-002623  
Application 14/251,520  
Technology Center 3600

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Before DENISE M. POTHIER, JOHNNY A. KUMAR, and  
LINZY T. McCARTNEY, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge*  
DENISE M. POTHIER

Opinion Concurring filed by *Administrative Patent Judge*  
JOHNNY A. KUMAR

POTHIER, *Administrative Patent Judge*.

DECISION ON APPEAL

## STATEMENT OF THE CASE

Appellants<sup>1,2</sup> appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1–20. App. Br. 3. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

### *Invention*

Appellants' invention concerns enterprise software (e.g., Enterprise Resource Planning software), including accounting applications that monitor an organization's finances. Spec. ¶ 2. The disclosed invention improves how enterprise software manages and executes its transaction volume by using two different data structures. *See* Spec. ¶¶ 3–4.

Claim 1 is reproduced below:

1. A method of accelerating execution of a batch of transactions using two different data structures, the method comprising:
  - storing, by a computer system, one or more financial ledgers in a relational database system;
  - prepopulating, by a computer system, a multidimensional data cube using data from the one or more financial ledgers in the relational database system, wherein the multidimensional data cube comprises aggregated balances used by the batch of transactions;
  - receiving, by the computer system, the batch of transactions;
  - executing, by the computer system, the batch of transactions using data in the multidimensional data cube, wherein:

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<sup>1</sup> Throughout this opinion, we refer to the Final Action (Final Act.) mailed June 26, 2015, the Appeal Brief (App. Br.) filed February 19, 2016, the Examiner's Answer (Ans.) mailed October 5, 2016, and the Reply Brief (Reply Br.) filed December 5, 2016.

<sup>2</sup> The real party in interest is listed as Oracle International Corporation. App. Br. 3.

the multidimensional data cube is queried for the aggregated balances; and  
the batch of transactions are executed using the queried aggregated balances of the multidimensional data cube to generate result values for each account affected by the batch of transactions;  
generating, by the computer system, one or more accounting journal entries that update each account in the one or more ledgers affected by the batch of transactions using the result values from the multidimensional data cube;  
posting, by the computer system, the one or more accounting journal entries to the one or more financial ledgers in the relational database system;  
repopulating, by the computer system, the multidimensional data cube with the changes resulting from the one or more accounting journal entries being posted to the one or more financial ledgers in the relational database system; and  
updating, by the computer system, the aggregated balances of the multidimensional data cube.

### *The Rejection*

Claims 1–20 are rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Final Act. 5–6.

### THE CONTENTIONS

Regarding claim 1, the Examiner finds that the claims are directed to an abstract idea of (1) “methods of organizing human activity” by “organiz[ing] information (financial data) through mathematical correlations” (Final Act. 4) and (2) “account reconciliation and management of a plurality of general ledgers, which is considered to be fundamental economic practice” (Final Act. 6). The Examiner also states the additional elements or the elements’ combination in the claim do not amount to

significantly more than the abstract idea and are mere instructions for implementing the abstract idea with a generic computer. *See* Final Act. 6.

Appellants disagree. Appellants first assert the claims are “directed to accelerating the execution of a batch of transactions using two different data structures,” not organizing information, performing mathematical correlations, or reconciling and managing accounts. App. Br. 6 (citing *buySAFE*,<sup>3</sup> *Bilski*,<sup>4</sup> and *Alice*<sup>5</sup>); *see also* Reply Br. 2 (contending claims do not solve an economic, financial, or human problem). Appellants next argue the claims recite significantly more than generic computer components and perform functions that are not merely generic. App. Br. 7; Reply Br. 4 (citing *July 2015 Update: Subject Matter Eligibility*, p. 7); *see also* Reply Br. 4 (citing *Enfish*<sup>6</sup>). Appellants outline three technological improvements resulting from transferring data back and forth between two different data structures: (1) accelerating data updates more efficiently, (2) decreasing processing time and reducing memory, and (3) reducing database bandwidth. App. Br. 5, 8; *see also* Reply Br. 2.

## ISSUE

Under § 101, has the Examiner erred in rejecting claims 1–20 by finding that the claims are directed to patent-ineligible subject matter?

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<sup>3</sup> *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350 (Fed. Cir. 2014).

<sup>4</sup> *Bilski v. Kappos*, 561 U.S. 593 (2010).

<sup>5</sup> *Alice Corp. v. CLS Bank International*, 134 S. Ct. 2347 (2014).

<sup>6</sup> *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016).

## ANALYSIS

Based on the record before us, we are persuaded of error.

The Patent Act defines patent-eligible subject matter broadly:

“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101. In *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 70 (2012), and *Alice*, 134 S. Ct. at 2354, the Supreme Court explained that § 101 “contains an important implicit exception” for laws of nature, natural phenomena, and abstract ideas. See *Diamond v. Diehr*, 450 U.S. 175, 185 (1981).

In *Mayo* and *Alice*, the Court set forth a two-step analytical framework for evaluating patent-eligible subject matter. First, “determine whether the claims at issue are directed to” a patent-ineligible concept, such as an abstract idea. *Alice*, 134 S. Ct. at 2355. If so, “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements” add enough to transform the “nature of the claim” into “significantly more” than a patent-ineligible concept. *Id.* at 2355, 2357 (quoting *Mayo*, 566 U.S. at 79); see *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016).

### *Mayo/Alice Step 1*

Step one in the *Mayo/Alice* framework involves looking at the “focus” of the claims at issue and their “character as a whole.” *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016); *Enfish*, 822 F.3d at 1335. This “inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether ‘their character as a whole is directed to excluded subject matter.’” *Enfish*, 822 F.3d at 1335 (quoting

*Internet Patent Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015)). According to the Examiner, claim 1 is directed to various abstract ideas, including a method of organizing human activity (Final Act. 4) as well as a fundamental economic practice of account reconciliation and management of general ledgers (*id.* at 6). Yet, we agree with Appellants that the Examiner fails to establish sufficiently that the claim’s character *as a whole* or claim 1’s focus is directed to an abstract idea.

As Appellants state, “[t]he independent claims are directed to accelerating the execution of a batch of transaction using two different data structures.” App. Br. 6. Although stating the claims are directed to a method of organizing human activity and a fundamental economic practice (Final Act. 5–6), the Examiner recognizes Appellants’ characterization of the claims, stating

the claims as a whole are generally directed to a system and method that seeks to accelerate execution of a batch of transactions using two different data structures, wherein one or more financial ledgers are stored in a relational database system and wherein data from said ledgers is prepopulated into a multidimensional data cube (*see at least claim 1 and paragraph [0004] of Appellant's specification*).

Ans. 3; *see also* Final Act. 4. That is, the claims as a whole recite how the two different data structures are used with a computer system to accelerate executing transactions and are directed to improving an existing technology embodied by how the two, different data structures operate as recited.

For example, claim 1 recites “[a] method of accelerating execution of a batch of transactions using two different data structure.” App. Br. 11 (Claims App’x). The claim further recites various, particular steps involving either (1) a relational database system (e.g., “storing . . . one or more financial ledgers in a relational database system” and “posting . . . one or

more accounting journal entries to the one or more financial ledgers in the relationship database”) or (2) a multidimensional data cube (e.g., “the multidimensional data cube comprises aggregated balances used by the batch of transactions,” “executing . . . the batch of transactions using data in the multidimensional data cube, wherein: the multidimensional data cube is queried for the aggregated balances; and the batch of transactions are executed using the queried aggregated balances of the multidimensional data cube to generate results values for each account affected by the batch of transactions,” “generating . . . one or more account journal entries that update each account of the one or more ledgers . . . using the results values from the multidimensional data cube,” and “updating . . . the aggregated balances of the multidimensional data cube.”). *Id.* (Claims App’x). Other steps in claim 1 involve both the relational database system and a multidimensional data cube (e.g., “pre-populating” step and “repopulating” step). *Id.* (Claims App’x).

To be sure, some of the limitations of claim 1 recite organizing, storing, and transmitting information and are related to entering data into a financial ledger (e.g., the steps of “storing . . . one or more financial ledgers” step and “generating . . . one or more accounting journal entries”). *See* Final Act. 6; *see also* Ans. 3–4. Yet, the claims as a whole are directed to a computer solution of accelerating transaction execution using one data structure (i.e., a multidimensional data cube) to perform certain functions/results and another, different data structure (i.e., a relational database) to achieve other functions/results.

Considering the claims in light the Specification, the disclosure bolsters that claims as a whole are directed to improving an existing, technological process of enterprise software implemented on a computer

system. Spec. ¶¶ 2–4. The disclosure explains the software “may be tested by the sheer volume of transactions it is forced to manage” (*id.* ¶ 3) and using only a relational database can “become computationally prohibitive” (*id.* ¶ 36). The Specification describes a process of “accelerating execution of a batch of transactions using two different data structures” (*id.* ¶ 4), including using a multidimensional data cube to take advantage of the multidimensional data cube’s “speed and aggregated balances . . . [that are] not available in a relational database” (*id.* ¶ 34). The Specification further indicates (a) a multidimensional data cube is faster and less computationally intensive than a relational database (*see id.* ¶ 53), (b) writing to the multidimensional data cube allows for totals at each stage to be updated immediately as aggregated balances (*see id.* ¶ 54), and (c) the aggregated balances and stored values in the multidimensional data cube “offer significantly processing and/computational advantages over accessing and storing data in a relational database” (*id.* ¶ 67).

As such, the claims seemingly focus on improving existing technology using two different data structure to achieve various benefits, such as increased processing and computational advantages over using only a relational database. *See also* App. Br. 5 (asserting (a) multidimensional data cubes, relative to relational databases, are good at performing calculations, pre-aggregating results, and executing transactions on the aggregated balances and (b) relational databases provide access and storage capacity that multidimensional data cubes do not). Also, the claimed solution appears to be rooted in computer technology overcoming problems specifically arising in the realm of using relational databases.

Although acknowledging the claims are directed to accelerating transaction execution using two different data structure (Ans. 3), the

Examiner does not address the claimed data structure features sufficiently in determining the claims' focus. *See id.* at 3–4. Instead, the Examiner concludes the claims merely seek to collect, compare, store, organize, and transmit data, without any further consideration of how the data structures operate in the claim. *See id.*; *see also* Reply Br. 3–4. Moreover, contrasting with *Enfish*, the Examiner asserts “the claims are not directed to ‘an improvement to computer technology,’ . . . but to the abstract idea itself.” Ans. 3. However, the Examiner provides no further explanation regarding how the instant claims are distinguishable from those in *Enfish*. *Id.*

Although independent claims 9 and 16 do not recite accelerating transaction execution using two different data structures in their preambles, each of claim 9 and 16 recites various steps involving two different data structures (i.e., a relational database and a multidimensional data cube) as noted above, which achieve accelerated execution and the other noted improvements to an existing technology.

Given the particular findings and record before us, the Examiner erred in determining the claims are directed to an abstract idea.

#### *Mayo/Alice Step 2*

Because we determine the Examiner fails to establish sufficiently the claims are directed to an abstract idea, we need not proceed to step 2. Nonetheless, under any characterization of the claim 1's abstract idea, including that presented in the concurrence, the instant claims satisfy *Mayo/Alice* step two. *See DDR Holdings, LLC v. Hotels.com, LP*, 773 F.3d 1245, 1257 (Fed. Cir. 2014). Specifically, the claimed components as a combination perform functions that are not merely generic.

The claimed components in independent claims 1, 9, and 16 (as well as their dependent claims) collectively add enough to transform the claims

into significantly more than any abstract idea identified by the Examiner (e.g., a method of organizing human activity and/or a fundamental economic practice (*see* Final Act. 4, 6)). For example, the claimed features as a combination do not simply apply an abstract idea (e.g., a business practice involving financial accounting and financial ledger management) to a computer system but accelerate transaction execution using two different data structures. *See* App. Br. 11 (Claims App'x); *see also, e.g.*, Spec. ¶ 4. As another example, the claimed combination also adds significantly more than any identified abstract ideas by using two different data structures, instead of only a relational database, to increase processing and computational advantages. *See* Spec. ¶ 53 (discussing how the multidimensional data cube generates data faster than a relational database), 67 (indicating the multidimensional data cube's aggregated balances have processing and computational advantages). *See also* App. Br. 7–8; *see also* Reply Br. 2, 4.

For the foregoing reasons, Appellants have persuaded us of error in the rejection of (1) independent claim 1, (2) independent claims 9 and 16, which recite commensurate limitations, and (3) dependent claims 2–8, 10–15, and 17–20 for similar reasons.

#### DECISION

We reverse the rejection of claims 1–20 under § 101.

REVERSED

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ABHIJIT DHAKEPHALKAR, DAVID HAIMES,  
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Appeal 2017-002623  
Application 14/251,520  
Technology Center 3600

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KUMAR, *Administrative Patent Judge*, concurring.

I concur with the majority's decision; however, I respectfully disagree with the majority's application of *Alice* two-step framework for the following reasons.

First, I agree with the Examiner that the claims are directed to an abstract idea of account reconciliation and management of general ledgers, which is considered both as a method of organizing human activity and a fundamental economic practice under *Alice* step 1. Final Act. 4–6. Such activities are squarely within the realm of abstract ideas. Account reconciliation and management of general ledgers is a fundamental business practice, like (1) risk hedging in *Bilski v. Kappos*, 561 U.S. 593 (2010), (2) intermediated settlement in *Alice*, 134 S. Ct. at 2356–57, (3) verifying credit card transactions in *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1370 (Fed. Cir. 2011), (4) collecting and analyzing information to

detect and notify of misuses in *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1093–94 (Fed. Cir. 2016), and (5) guaranteeing transactions in *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1354 (Fed. Cir. 2014).

Account reconciliation and management of general ledgers is also a building block of a market economy. Thus, account reconciliation and management of general ledgers, like risk hedging, intermediated settlement, and verifying credit card transactions, is an “abstract idea” beyond the scope of § 101.

*See Alice*, 134 S. Ct. at 2356.

Turning now to *Alice* step 2, I agree with Appellants that there are sufficient additional elements recited in the claims that are meaningful and that can transform the abstract idea into a patent eligible application of the abstract idea. The Federal Circuit cases on point are (1) *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014) and (2) *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2016), both involved business methods inventions. In *DDR* and *Amdocs*, the Federal Circuit opted to bypass *Alice* step 1 in favor of step 2. In particular, the Federal Circuit found *DDR*’s claims contain an “inventive concept” under *Alice* step 2 because *DDR*’s claims (1) do not merely recite “the performance of some business practice known from the pre-Internet world” previously disclosed in *Bilski* and *Alice*, but instead (2) provide a technical solution to a technical problem unique to the Internet, *i.e.*, a “solution [] necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.” *DDR*, 773 F.3d at 1257. Likewise, the Federal Circuit also found *Amdocs*’ claims contain a sufficient “inventive concept” because like *DDR*, *Amdocs*’ claims “entail[] an unconventional technological solution (enhancing data in a distributed fashion) to a technological problem (massive record flows which previously

required massive databases)” and “improve the performance of the system itself.” *Amdocs*, 841 F.3d at 1300, 1302.

Similar to *DDR* and *Amdocs*, I am persuaded that there is evidence in the record to suggest Appellants’ claims also contain an “inventive concept” under *Alice* step 2 because these claims also focus on improving existing technology using two different data structure to achieve various benefits, such as increased processing and computational advantages over using only a relational database. App. Br. 5, 8 (asserting (a) multidimensional data cubes, relative to relational databases, are good at performing calculations, pre-aggregating results, and executing transactions on the aggregated balances and (b) relational databases provide access and storage capacity that multidimensional data cubes do not).

For these reasons, I would find Appellants’ claims 1–20 patent-eligible under § 101.