UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/362,786	01/31/2012	Nabil A. Abu El Ata	3023.1005-001	5038

21005 7590 11/01/2019

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER	
ROSS, SCOTT M	

ART UNIT	PAPER NUMBER
3623	

NOTIFICATION DATE	DELIVERY MODE
11/01/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing.department@hbsr.com
helpdesk@hbsr.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NABIL A. ABU EL ATA

Appeal 2018-006953
Application 13/362,786
Technology Center 3600

Before JOSEPH L. DIXON, JENNIFER L. McKEOWN, and LINZY T. McCARTNEY, *Administrative Patent Judges.*

DIXON, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant,[1] Nabil A. Abu El Ata, appeals from the Examiner's decision to reject claims 1–8 and 10–15. Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

[1] We use the word "Appellant" to refer to "Applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Nabil A Abu El Ata, the inventor. App. Br. 1.

CLAIMED SUBJECT MATTER

The claims are directed to a predictive deconstruction of dynamic complexity. Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. A computer implemented method for evaluating operation of an information system architecture, comprising:
>
> in a computer processor:
>
> obtaining a multi-layer mathematical model of architecture of an information system of the enterprise, the information system architecture supporting the business process design, layers of the multi-layer model comprising a business layer, an application layer, and a technology layer, the multi-layer mathematical model including a definition of changes undertaken by a plurality of components of the model over time in response to an indicated input;
>
> modeling performance metrics of the multi-layer model under a first set of operational parameters, said modeling including dimensions of cost, quality of service and throughput;
>
> generating a second set of operational parameters, the second set being distinct from the first set of operational parameters by one set of variables, the one set of variables include at least one of: failure of a component of the system architecture, a delay of an operation, a change in a sequence of operations, and an alternative mode of operation;
>
> modeling performance metrics of the multi-layer model under the second set of operational parameters, said modeling including dimensions of cost, quality of service and throughput;
>
> comparing the performance metrics of the second set of operational parameters against at least one of the performance metrics of the first set of operational parameters and a set of

predetermined thresholds, the predetermined thresholds having dimensions of cost, quality of service, and throughput;

determining a rate of change over time in the performance metrics of the second set of operational parameters relative to the performance metrics of the first set of operational parameters;

determining whether the rate of change over time exceeds at least one of the predetermined thresholds;

identifying an adverse event based on an increase in dynamic complexity of the information system as indicated by the mathematical model, the increase in dynamic complexity being determined by an exponential rate of change over time of at least one of the performance metrics and the determination whether the rate of change exceeds at least one of the predetermined thresholds;

reporting the adverse event and characteristics of the information system architecture under the second set of operational parameters;

identifying a modification to the multi-layer model, the modification causing the multi-layer model to avoid the adverse event under the second set of operational parameters;

updating the multi-layer model to incorporate the modification; and

modifying the information system of the enterprise based on the updated multilayer model to provide a modified information system, the modified information system being configured to avoid the adverse event under the second set of operational parameters.

REJECTION[2]

Claims 1–8 and 10–15 stand rejected under 35 U.S.C. § 101 because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more.

OPINION

35 U.S.C. § 101

With respect to independent claims 1 and 15, Appellant does not set forth separate arguments for patent eligibility of the claims. Rather, Appellant relies upon the arguments advanced with respect to independent claim 1 for each of the separate claim groupings. (Appeal Br. 8–9.) Therefore, we select independent claim 1 as the illustrative claim for the group and will address Appellant's arguments thereto. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2017).

Appellant disagrees with the Examiner's rejection of claims 1 and 15 and contends that in "*Enfish, LLC v. Microsoft Corp.*[3], the Federal Circuit found that inventions implemented in computer systems are not necessarily directed to an abstract idea, even if directed entirely to software." (Ans. 8–9.)

Appellant further contends that "the Federal Circuit held that an invention is not directed to an abstract idea, and is therefore directed to patent-eligible subject matter, if the claims are directed 'to a specific improvement to the way computers operate.'" (Appeal Br. 9.) Specifically, Appellant contends that claim 1 recites such a specific improvement of

[2] The Examiner has withdrawn the rejections under 35 U.S.C. §§ 103 and 112. (Ans. 3.)
[3] *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016).

"modifying the information system of the enterprise based on the updated multi-layer model." (Appeal Br. 9.) Appellant argues claim 1 recites a specific improvement to an information system such as a computer network and claim 1 also recites that the modification "provide[s] a modified information system, the modified information system being configured to avoid the adverse event under the second set of operational parameters," and this recitation clarifies that the modified information system is specifically improved in that it operates to avoid the adverse event. (Appeal Br. 9.) Additionally, Appellant contends that an illustration of this improvement is described above with reference to the § 112 rejection. (Appeal Br. 9 (incorporating Appeal Br. 6–8).) Specifically, Appellant contends that "Appellant's Fig. 8 depicts an action agent 830 that can take remedial actions to modify the information system, and Fig. 10 illustrates specific remedial actions (e.g., redistributing the SQL, decreasing logical I/O throughput)." (Appeal Br. 9.) Appellant concludes that claim 1 recites a "specific improvement to the way computers operate," and, thus, is directed to patent-eligible subject matter under § 101. (Appeal Br. 9.)

The Supreme Court's two-step framework guides our analysis of patent eligibility under 35 U.S.C. § 101. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 217 (2014). In addition, the Office recently published revised guidance for evaluating subject matter eligibility under 35 U.S.C. § 101, specifically with respect to applying the *Alice* framework. USPTO, *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Office Guidance"). If a claim falls within one of the statutory categories of patent eligibility (i.e., a process, machine, manufacture, or composition of matter) then the first inquiry is whether the claim is directed

to one of the judicially recognized exceptions (i.e., a law of nature, a natural phenomenon, or an abstract idea). *Alice*, 573 U.S. at 217. As part of this inquiry, we must "look at the 'focus of the claimed advance over the prior art' to determine if the claim's 'character as a whole' is directed to excluded subject matter." *Affinity Labs of Tex., LLC v. DirecTV, LLC*, 838 F.3d 1253, 1257–58 (Fed. Cir. 2016) (internal citations omitted). Per Office Guidance, this first inquiry has two prongs of analysis: (i) does the claim recite a judicial exception (e.g., an abstract idea), and (ii) if so, is the judicial exception integrated into a practical application. Office Guidance, 84 Fed. Reg. at 54. Under the Office Guidance, if the judicial exception is integrated into a practical application, *see infra*, the claim passes muster under § 101. Office Guidance, 84 Fed. Reg. at 54–55. If the claim is directed to a judicial exception (i.e., recites a judicial exception and does not integrate the exception into a practical application), the next step is to determine whether any element, or combination of elements, amounts to significantly more than the judicial exception. *Alice*, 573 U.S. at 217; Office Guidance, 84 Fed. Reg. at 56.

Step 2A, Prong One

For the reasons discussed below, we conclude Appellant's claim 1 recites an abstract idea. Appellant's claims generally recite a computer implemented method for evaluating operation of an information system architecture. This is consistent with how Appellant describes the claimed embodiment of the invention. (*See, e.g.*, Spec. 6–9, 14–16, 24, 27, 31, 48, 49, 54, 64, Fig. 1; *see* Appeal Br. 1–2 (Summary of the Claimed Subject Matter).)

Consistent with our Office Guidance and case law, we conclude that a computer implemented method for evaluating operation of an information system architecture, comprising i) obtaining a multi-layer mathematical model of architecture of an information system of the enterprise; ii) modeling performance metrics of the multi-layer model under a first set of operational parameters; iii) generating a second set of operational parameters, the second set being distinct from the first set of operational parameters by one set of variables; iv) modeling performance metrics of the multi-layer model under the second set of operational parameters; v) comparing the performance metrics of the second set of operational; vi) determining a rate of change over time in the performance metrics; vii) determining whether the rate of change over time exceeds at least one of the predetermined thresholds; viii) identifying an adverse event; ix) reporting the adverse event and characteristics; x) identifying a modification to the multi-layer model; and xi) updating the multi-layer model is a mathematical concept, recited as such in a claim limitation.[4]

[4] Our reviewing court recognizes that "[a]n abstract idea can generally be described at different levels of abstraction." *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1240 (Fed. Cir. 2016). That need not and, in this case does not, "impact the patentability analysis." *Apple*, 842 F.3d at 1241. Further, "[a]n abstract idea can generally be described at different levels of abstraction . . . . The Board's slight revision of its abstract idea analysis does not impact the patentability analysis." *Apple*, 842 F.3d at 1241. Moreover, merely combining several abstract ideas does not render the combination any less abstract. *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017) ("Adding one abstract idea (math) to another abstract idea . . . does not render the claim non-abstract."); *see also FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1093–94 (Fed. Cir. 2016) (determining the pending claims were directed to a combination of abstract ideas).

In the Examiner's Answer, the Examiner maintains that the claims are directed to using a mathematical models to evaluate operation of an information system architecture. (Ans. 4–5). The Examiner maintains that the claimed invention is a "similar to other concepts that have been found abstract such as *Collecting information, analyzing it, and displaying certain results of the collection and* analysis" (*Electric Power Group*), and "organizing information through mathematical correlations" (*Digitech*).[5] (Ans. 4.)

The Examiner further maintains that under the broadest reasonable interpretation, the claims merely modify data and is an abstract idea. The Examiner further maintains the claims are similar to the patent-ineligible claims in *Digitech* because the claims employ mathematical algorithms to generate additional information and is, thus, an abstract idea. (Ans. 5.)

In *Digitech*, "[t]he method in the [patent at issue] claims an abstract idea because it describes a process of organizing information through

See also SAP Am., Inc. v. InvestPic, LLC, 898 F.3d 1161, 1163 (Fed. Cir. 2018) (holding that claims to a "series of mathematical calculations based on selected information" are directed to abstract ideas); *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014) (holding that claims to a "process of organizing information through mathematical correlations" are directed to an abstract idea); *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1280 (Fed. Cir. 2012) (identifying the concept of "managing a stable value protected life insurance policy by performing calculations and manipulating the results" as an abstract idea).

[5] *Elec. Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016); *Digitech*, 758 F.3d 1344.

mathematical correlations and is not tied to a specific structure or machine." *Digitech*, 758 F.3d at 1350. Our reviewing court further held in *Digitech*:

> The above claim recites a process of taking two data sets and combining them into a single data set, the device profile. The two data sets are generated by taking existing information—*i.e.*, measured chromatic stimuli, spatial stimuli, and device response characteristic functions—and organizing this information into a new form. The above claim thus recites an ineligible abstract process of gathering and combining data that does not require input from a physical device . . . the two data sets and the resulting device profile are ineligible subject matter. Without additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible. "If a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory."

Digitech, 758 F.3d at 1351 (quoting *Parker v. Flook*, 437 U.S. 584, 595 (1978) (internal quotations omitted)).

Moreover, the Federal Circuit holds that claims broadly covering data collection, communication, and processing are directed to abstract ideas. *See, e.g.*, *Univ. of Fla. Research Found., Inc. v. General Elec. Co.*, 916 F.3d 1363, 1366–68 (Fed. Cir. 2019); *SAP Am.*, 898 F.3d at 1164–67; *Secured Mail Sols. LLC v. Universal Wilde, Inc.*, 873 F.3d 905, 907–08, 910–11 (Fed. Cir. 2017); *Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1047, 1054–56, 1054 n.6 (Fed. Cir. 2017); *RecogniCorp*, 855 F.3d at 1324, 1326–27; *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1339–41 (Fed. Cir. 2017). As the Federal Circuit has explained, "[a] process that start[s] with data, add[s] an algorithm, and

end[s] with a new form of data [is] directed to an abstract idea." *RecogniCorp*, 855 F.3d at 1327.

Claim 1 is reproduced below and includes the following claim limitations that recites a method for evaluating operation of an information system architecture, emphasized in *italics*:

> 1. A computer implemented method for evaluating operation of an information system architecture, comprising:
>
> in a computer processor:
>
> *obtaining a multi-layer mathematical model* of architecture of an information system of the enterprise, the information system architecture supporting the business process design, layers of the multi-layer model comprising a business layer, an application layer, and a technology layer, the multi-layer mathematical model including a definition of changes undertaken by a plurality of components of the model over time in response to an indicated input;
>
> *modeling performance metrics of the multi-layer model under a first set of operational parameters,* said modeling including dimensions of cost, quality of service and throughput;
>
> *generating a second set of operational parameters, the second set being distinct from the first set of operational parameters by one set of variables*, the one set of variables include at least one of: failure of a component of the system architecture, a delay of an operation, a change in a sequence of operations, and an alternative mode of operation;
>
> *modeling performance metrics of the multi-layer model under the second set of operational parameters,* said modeling including dimensions of cost, quality of service and throughput;
>
> *comparing the performance metrics of the second set of operational parameters against at least one of the performance*

metrics of the first set of operational parameters and a set of predetermined thresholds, the predetermined thresholds having dimensions of cost, quality of service, and throughput;

determining a rate of change over time in the performance metrics of the second set of operational parameters relative to the performance metrics of the first set of operational parameters;

determining whether the rate of change over time exceeds at least one of the predetermined thresholds;

identifying an adverse event based on an increase in dynamic complexity of the information system as indicated by the mathematical model, the increase in dynamic complexity being determined by an exponential rate of change over time of at least one of the performance metrics and the determination whether the rate of change exceeds at least one of the predetermined thresholds;

reporting the adverse event and characteristics of the information system architecture under the second set of operational parameters;

identifying a modification to the multi-layer model, the modification causing the multi-layer model to avoid the adverse event under the second set of operational parameters;

updating the multi-layer model to incorporate the modification; and

modifying the information system of the enterprise based on the updated multilayer model to provide a modified information system, the modified information system being configured to avoid the adverse event under the second set of operational parameters.

More particularly, the method for evaluating operation of an information system architecture is a mathematical concept and consistent with our Office Guidance and case law, we conclude that method for evaluating operation of an information system architecture recites a mathematical concept and, thus, an abstract idea. *See* Office Guidance, 84 Fed. Reg. at 52.

Step 2A, Prong Two

Because the claim recites an abstract idea, we next determine whether the claim integrates the abstract idea into a practical application. Office Guidance, 84 Fed. Reg. at 54. To determine whether the judicial exception is integrated into a practical application, we identify whether there are "*any additional elements recited in the claim beyond the judicial exception(s)*" and evaluate those elements to determine whether they integrate the judicial exception into a recognized practical application. Office Guidance, 84 Fed. Reg. at 54–55 (emphasis added); *see also* Manual of Patent Examining Procedure ("MPEP") §§ 2106.05(a)–(c), (e)–(h) (9th ed., Rev. 08.2017, Jan. 2018).

Here, we find the additional limitation of "modifying the information system of the enterprise based on the updated multilayer model to provide a modified information system, the modified information system being configured to avoid the adverse event under the second set of operational parameters" integrates the judicial exception into a practical application. More particularly, the claims recite one of (i) an improvement to the functionality of a computer or other technology or technical field (*see* MPEP § 2106.05(a)); (ii) use a "particular machine" to apply or use the judicial

exception (*see* MPEP § 2106.05(b)); (iii) a particular transformation of an article to a different thing or state (*see* MPEP § 2106.05(c)); or (iv) any other meaningful limitation (*see* MPEP § 2106.05(e)). *See also* Office Guidance, 84 Fed. Reg. at 55.

We find the step of "modifying the information system of the enterprise based on the updated multilayer model to provide a modified information system, the modified information system being configured to avoid the adverse event under the second set of operational parameters" to apply or use the judicial exception to modify the information system of the enterprise so that the information system is different after the modification. (*See* Appeal Br. 7–8 (citing Spec. 24, 27).)

The step of "modifying the information system of the enterprise based on the updated multilayer model to provide a modified information system, the modified information system being configured to avoid the adverse event under the second set of operational parameters" is more than the type of extra-solution activities (i.e., in addition to the judicial exception) the courts have determined insufficient to transform judicially excepted subject matter into a patent-eligible application. *See* MPEP § 2106.05(g); *see also Bilski v. Kappos*, 561 U.S. 593, 612 (2010) (holding the use of well-known techniques to establish inputs to the abstract idea as extra-solution activity that fails to make the underlying concept patent eligible); *Elec. Power*, 830 F.3d at 1355 (explaining that "selecting information, by content or source, for collection, analysis, and display does nothing significant to differentiate a process from ordinary mental processes"); *Elec. Power*, 830 F.3d at 1354 (recognizing "that merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a

particular tool for presentation), is abstract as an ancillary part of such collection and analysis"); *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Can.*, 771 F.Supp.2d 1054, 1065 (E.D. Mo. 2011) *aff'd*, 687 F.3d 1266 (Fed. Cir. 2012) (explaining that "storing, retrieving, and providing data . . . are inconsequential data gathering and insignificant post solution activity").

Here, Appellant's claims recite specific limitations (or a combination of limitations) that are not generic. In addition, we note Appellant describes "modifying" step of the claimed invention with respect to the "action agent 830" and the components to perform specific examples of self-healing functions and performs more than generic functions. (*See, e.g.*, Spec. 24–28, Fig. 10; Spec. 28:18–22 ("[P]roposed actions may be directed to rerouting traffic through the network, modifying priority to network access points, or reconfiguring network routers in other ways. Fig. 10 is a chart 1000 illustrating content of an exemplary case, as well as mechanisms of identifying, acting upon and updating the case.").)

Here, like the claims at issue in *DDR Holdings*, Appellant's claims address a specific problem arising in the realm of computer networks (i.e., "modifying the information system of the enterprise based on the updated multilayer model to provide a modified information system, the modified information system being configured to avoid the adverse event under the second set of operational parameters," and they improve an existing technological process. *See DDR Holdings*, 773 F.3d at 1258–59; *see also Enfish*, 822 F.3d at 1335–36 (distinguishing between claims *wherein the focus of the claims* is on an improvement in computer capabilities and those that invoke a computer as a tool).

For at least the foregoing reasons, the claims integrate the judicial exception into a practical application by modifying the information system of the enterprise. From the corresponding disclosure in the Specification the modification is more than just merely manipulation of data in an abstraction.

Step 2B

Because we found the claims recite additional limitations that integrate the abstract idea and mathematical concepts into a practical application, we do not address the claimed invention under *Step 2B.*

For the reasons discussed *supra*, we are persuaded of Examiner error. Accordingly, we reverse the Examiner's patent eligibility rejection of independent claim 1 under 35 U.S.C. § 101 and its dependent claims 2–8 and 10–14. Because independent claim 15 contains similar claim language, we also reverse the Examiner's patent eligibility rejection of independent claim 15.

DECISION

We reverse the Examiner's patent eligibility rejection of claims 1–8 and 10–15.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
1–8, 10–15	101			1–8, 10–15
Overall outcome				1–8, 10–15

REVERSED