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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* ALEXANDER GILGUR, YUVAL LEVIN,  
MICHAEL F. PERKA, AND DALE QUANTZ

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Appeal 2017-003726  
Application 12/036,167  
Technology Center 3600

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Before MICHAEL J. STRAUSS, JEREMY J. CURCURI, and  
JOSEPH P. LENTIVECH, *Administrative Patent Judges*.

LENTIVECH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellants<sup>1</sup> appeal from the Examiner's decision to reject claims 1–8, 10–23, and 25–29. Claims 9, 24, and 30 have been canceled. *See* App. Br. 23–28 (Claims App'x). We have jurisdiction over the pending claims under 35 U.S.C. § 6(b).

We affirm.

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<sup>1</sup> According to Appellants, the real party in interest is Dell Software Inc. App. Br. 3.

STATEMENT OF THE CASE

*Appellants' Invention*

Appellants' invention generally relates to “computer-implemented modeling and forecasting, specifically to applications in which large numbers of scenarios have to be processed in a batch.” Spec. ¶ 3.

According to Appellants, “[t]he present invention can be used to reduce the number of scenarios forecasted in each batch, in order to optimize the time required to perform those forecasts.” *Id.* Claim 1, which is illustrative, reads as follows:

1. A computer-implemented method for optimizing runtime and utilization of computer resources in bulk statistical data modeling and forecasting, the method comprising:

for each scenario in a plurality of scenarios:

determining with one or more computer processors a recommended number of collected data points that, once accumulated via new data collection, should trigger computation of a forecast for the scenario, the recommended number of collected data points being determined as a function of seasonal variation, model uncertainty, and data quality;

determining with one or more computer processors a cap on time to elapse since a most recent forecast of the scenario that, once elapsed, should trigger computation of the forecast, the cap being determined as a number proportional to the recommended number of collected data points;

forecasting with one or more computer processors one or more confidence guardbands associated with future data points;

determining, based on at least one of data behavior, the recommended number of collected data points, and the cap on time to elapse, when to compute the forecast;

periodically bulk processing the plurality of scenarios in batch to generate forecasts comprising:

for each scenario, checking newly collected data to determine whether to adjust the recommended number of collected data points when the newly collected data comprises an outlier data point that exceeds the confidence guardbands, wherein adjusting the recommended number of collected data points comprises including at least two subsequent data points to ensure that the outlier data point is not the last point in a time series,

optimizing the bulk processing by only forecasting scenarios in the plurality of scenarios for which the adjusted recommended number of collected data points has been exceeded, the cap on time to elapse has been exceeded, or at least three data points in the newly collected data have fallen outside the one or more confidence guardbands.

#### *References*

The Examiner relies on the following prior art in rejecting the claims:

Tzvieli	US 5,659,593	Aug. 19, 1997
Singh et al.	US 2002/0169657 A1	Nov. 14, 2002
Harris	US 2003/0158772 A1	Aug. 21, 2003
Moessner	US 2005/0137835 A1	June 23, 2005
Lindquist et al.	US 2007/0265904 A1	Nov. 15, 2007
Kakouros et al.	US 7,584,116 B2	Sept. 1, 2009

*Rejections*

Claims 1–8, 10–23, and 25–29 stand rejected under 35 U.S.C. § 101 as being directed to judicially-excepted subject matter under 35 U.S.C. § 101. Final Act. 12–16.

Claims 1–8, 10, 11, 13, 15–23, 25, 26, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kakouros, Singh, Moessner, and Lindquist. Final Act. 17–38.

Claims 12 and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kakouros, Singh, Moessner, Lindquist, and Tzvieli. Final Act. 39–40.

Claims 14 and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kakouros, Singh, Moessner, Lindquist, and Harris. Final Act. 41–42.

ANALYSIS

*Rejection under 35 U.S.C. § 101*

Under 35 U.S.C. § 101, a patent may be obtained for “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” The Supreme Court has “long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. v. CLS Bank Int’l*, 134 S.Ct. 2347, 2354 (2014) (quoting *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)). The Supreme Court in *Alice* reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 82–84 (2012), “for distinguishing patents that claim laws of nature,

natural phenomena, and abstract ideas from those that claim patent-eligible applications of these concepts.” *Alice*, 134 S.Ct. at 2355. The first step in that analysis is to “determine whether the claims at issue are directed to one of those patent-ineligible concepts,” such as an abstract idea. The inquiry often is whether the claims are directed to “a specific means or method” for improving technology or whether they are simply directed to an abstract end-result. *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1311, 1314 (Fed. Circ. 2016). If the claims are not directed to a patent-ineligible concept, the inquiry ends. Otherwise, the inquiry proceeds to the second step, where the elements of the claims are considered “individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 79–80, 1297). We, therefore, look to whether the claims focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016).

The Examiner finds the claims are directed to “optimizing runtime and utilization of computer resources in bulk statistical data modeling and forecasting.” Final Act. 13. The Examiner finds the claims recite limitations “directed to mathematical equations/formulas” and “comparing new information such as newly collected data and stored information such as recommended number of collected data points and using rules to adjust the recommended number of collected data points and optimize the processing of scenarios” and, therefore, that the claims are directed to an abstract idea.

Final Act. 13–14. The Examiner further finds that the additional elements recited in the claims, when considered individual or as a whole, do not amount to “significantly more” than the abstract idea. Final Act. 14–16.

Initially, Appellants contend the Examiner failed to consider each claim as a whole and failed to consider the limitations of the claims both individually and in combination. App. Br. 7–8. Appellants argue “the Examiner articulates two different analyses to arrive at two different alleged abstract ideas to which the claims are supposedly directed” (App. Br. 7) and “[i]n each analysis, the Examiner relies upon different portions of different alleged claim limitations to reach a different results-driven conclusion of unpatentability” (App. Br. 8).

We do not find Appellants’ arguments persuasive. A finding that a claim is directed to multiple abstract ideas does not necessarily evidence a failure to consider the claims as a whole or a failure to consider the limitations of the claims both individually and in combination. *See FairWarning IP, LLC v. Iatric Systems, Inc.*, 839 F.3d 1089, 1093–94 (Fed. Cir. 2016) (“Here, the claims are directed to a combination of these abstract-idea categories.”); *see also RecogniCorp, LLC v. Nintendo Co., Ltd.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017) (finding the claims directed to multiple abstract ideas).

Appellants further contend the claims are not directed to the abstract ideas of mathematical equations or formulas and comparing new and stored information and using rules to adjust the recommended number of collected data points and optimize the processing of scenarios. App. Br. 8–9. Appellants argue the claims are not directed to mathematical equations or formulas because the claims are not directed to performing calculations and

do not recite any particular mathematical equation or formula for performing calculations. App. Br. 8. Appellants further argue that courts have not found “comparing new information such as newly collected data and stored information such as recommended number of collected data points and using rules to adjust the recommended number of collected data points and optimize the processing of scenarios” to be an abstract idea. App. Br. 9.

According to Appellants, the claims are not directed to an abstract idea but, instead, are directed to “an improvement in computer capabilities, namely, the ability of a computer to more efficiently process large numbers of scenarios in a batch.” App. Br. 11 (citing Spec. ¶¶ 6–7, 37). Appellants argue the claims address the technical problem of how to efficiently bulk process scenarios on a computer system and the claimed solution to this technical problem “is concerned with efficiently using the resources of a computer system to bulk process bulk forecasts, specifically, by reducing the overall workload of a central processing unit and input/output devices.” App. Br. 12.

We do not find Appellants’ arguments persuasive. We agree with the Examiner that the claims are directed to the abstract idea of performing bulk statistical data modeling and forecasting. Final Act. 13. The steps recited in independent claims 1 and 15, including, for example, “determining . . . the recommended number of collected data points;” “determining . . . a cap on time to elapse;” “forecasting . . . one or more confidence guardbands;” “determining . . . when to compute the forecast;” and “periodically bulk processing the plurality of scenarios in batch to generate forecasts” based on a set of rules are abstract processes of collecting and analyzing information. Information, as such, is intangible, and data analysis, comparisons, and

algorithms are abstract ideas. *See, e.g., Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 451 n.12 (2007); *Alice*, 134 S. Ct. at 2355; *Parker v. Flook*, 437 U.S. 584, 589, 594–95 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972). Information collection and analysis, including when limited to particular content, is within the realm of abstract ideas. *See, e.g., Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1349 (Fed. Cir. 2015); *Digitech Image Techs., LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1351 (Fed. Cir. 2014); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1370 (Fed. Cir. 2011). That is, “[w]ithout additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible.” *Digitech*, 758 F.3d at 1350–51 (“Data in its ethereal, non-physical form is simply information that does not fall under any of the categories of eligible subject matter under section 101”).

We are not persuaded by Appellants’ argument that the claims are directed to “an improvement in computer capabilities, namely, the ability of a computer to more efficiently process large numbers of scenarios in a batch.” App. Br. 11. The Specification provides that the claimed process is implemented using conventional programming techniques on conventional hardware. *See Spec.* ¶ 45 (“The present invention also relates to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, or it may comprise a general-purpose computer selectively activated or reconfigured by a computer program stored in the computer.”); ¶ 46 (“The algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. . . . In addition, the present invention is not

described with reference to any particular programming language.”). Merely programming a computer to implement a process for processing large numbers of scenarios in a batch does not change how the computer *itself* operates. Appellants’ claims are directed to an improvement in an algorithm executed by a conventional computer using standard programming techniques, and not to a specific improvement in the way the computer operates. *See Parker v. Flook*, 437 U.S. 584, 595 (1978) (“[I]f 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.”).

Turning to the second step of the analysis, Appellants argue “the claimed solution is necessarily rooted in computer technology in order to overcome the technical problem of how to efficiently bulk processes scenarios on a computer system” and, therefore, recites significantly more than the abstract idea. App. Br. 13. Appellants argue the Examiner acknowledges that the claims are directed to optimizing runtime and utilization of computer resources in bulk statistical data modeling and forecasting, which “are clearly both improvements to technology and improvements to the functioning of the computer itself in the specific context of bulk processing forecasts or scenarios.” App. Br. 14 (citing Final Act. 13). Appellants further argue “improved runtime and utilization of computer resources such as CPU and I/O devices will inure benefit of end users in the form of an improved end-user experience” and “[t]his benefit . . . is evidence of the existence of ‘significantly more’.” App. Br. 14.

We do not find Appellants’ arguments persuasive. Appellants’ claims do not go beyond generic functions, and there are no technical means for

performing the claimed steps that are arguably an advance over conventional computer technology. *See Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1351 (Fed. Cir. 2016). Features such as, for example, the one or more computer processors recited in claim 1 and the non-transitory computer-usable medium recited in claim 15 are described and claimed generically rather than with the specificity necessary to show how those components provide a concrete solution to the problem addressed by the claims. The recited features, therefore, fail to cause the claims to recite significantly more than the abstract idea of performing bulk statistical data modeling and forecasting.

Because claims 1–8, 10–23, and 25–29 are directed to a patent-ineligible abstract concept, and do not recite something “significantly more” under the second step of the *Alice* analysis, we sustain the Examiner’s rejection of these claims under 35 U.S.C. § 101.

*Rejections under 35 U.S.C. § 103(a)*

We have reviewed the Examiner’s rejections under 35 U.S.C. § 103(a) in light of Appellants’ arguments that the Examiner has erred. We disagree with Appellants’ conclusions. We adopt as our own the findings and reasons set forth by the Examiner in the Final Office Action from which this appeal is taken and the reasons set forth in the Examiner’s Answer in response to Appellants’ Appeal Brief. Final Act. 17–42; Ans. 46–53. We highlight and address specific findings and arguments for emphasis as follows.

Appellants contend the combination of Kakouros, Singh, Moessner, and Lindquist fails to teach or suggest the limitations recited in claim 1 because the cited references do not teach or suggest “a recommended

number of collected data points” and “a cap on time to elapse,” as recited in claim 1. App. Br. 15–20. Initially, Appellants contend the Examiner has failed to establish a prima facie case of obvious. App. Br. 15–17.

Appellants argue:

[T]he Examiner cites to Kakouros, Singh, Moessner and Lindquist in such a piecemeal fashion that Appellant is unable to adequately determine how the Examiner purports to reconstruct the claimed invention. Rather than provide explicit analysis of each claim as a whole, the Examiner appears to treat each claim element in isolation and ignore antecedent basis. The Examiner’s citations and quotations relative to one claim element are largely incongruous with the citations and quotations made relative to other elements of the same claim, many of which recite some of the same claim terms. The Examiner fails to address the invention “as claimed.”

App. Br. 16. Appellants argue that because the Examiner acknowledges that the combination of Kakouros, Singh, and Moessner does not teach or suggest “a recommended number of collected data points” and “a cap on time to elapse,” as defined by claim 1,

[T]he Kakouros-Singh-Moessner combination necessarily also fails to disclose certain corresponding features of claim 1 such as, for example, “determining ... a *recommended number of collected data points* ...,” “determining ... a *cap on time to elapse* ...,” “for each scenario, checking newly collected data to determine whether to adjust *the recommended number of collected data points* ...,” and “optimizing the bulk processing by only forecasting scenarios in the plurality of scenarios for which the *adjusted recommended number of collected data points* has been exceeded, *the cap on time to elapse* has been exceeded, or at least three data points in the newly collected data have fallen outside the one or more confidence guardbands.”

App. Br. 17 (citing Final Act. 28). Appellants further argue:

An assertion by the Examiner that Lindquist discloses the snipped-out claim language defining the terms *recommended*

*number of collected data points* and *cap on time elapse*, terms which are used repeatedly in claim 1 with respect to several claim features as shown above, is conclusory and *prima facie* deficient. The Examiner provides no reasoning to resolve the clear failure of the Kakouros-Singh-Moessner combination to disclose the above claim features in the “fashion claimed.” In the Office Action, the Examiner only addresses portions of claim features and does not provide any rational underpinning for combination in terms of the claim as a whole.

App. Br. 17.

We do not find Appellants’ contention persuasive. The Examiner finds Kakouros teaches “a computer-implemented method for optimizing runtime and utilization of computer resources in bulk statistical data modeling and forecasting.” Final Act. 17 (citing Kakouros 3:40–47). The Examiner further finds Kakouros teaches that the method includes:

“determining with one or more computer processors a recommended number of collected data points as a function of forecast horizon and data and model quality parameters” (Final Act. 17–18 (citing Kakouros 1:37–41; 3:40–47; 4:1–20; 6:56–7:10));

“determining with one or more computer processors a cap on time to elapse as a number proportional to the recommended number of collected data points” (Final Act. 18–19 (citing Kakouros 6:56–67; 7:4–9; 9:12–25));

“forecasting with one or more computer processors one or more confidence guardbands associated with future data points” (Final Act. 19–20 (citing Kakouros, Fig. 7; 5:11–16; 9:13–19, 27–30; 13:1–17; 16:5–15)); and

“when future data points fall outside the one or more confidence guardband, generating with one or more computer processors a forecast model that is unscheduled” (Final Act. 20 (citing Kakouros 4:20–28; 5:22–23; 10:3–8, 12–20; 13:18–24)).

The Examiner finds Singh teaches:

“for each scenario in plurality of scenarios: determining with one or more computer processors a recommended number of collected data points as a function of seasonal variation, model uncertainty, of forecast horizon and data quality” (Final Act. 22 (citing Singh ¶¶ 6, 47, 61));

“determining with one or more computer processors a cap on time to elapse, the cap being determined as a number proportional to the recommended number of collected data points” (Final Act. 22 (citing Singh ¶ 59));

“forecasting with one or more computer processors one or more confidence guardbands associated with future data points” (Final Act. 23 (citing Singh ¶ 60));

“determining, based on at least one of data behavior, the recommended number of collected data points, and the cap on time to elapse, when to compute the forecast” (Final Act. 23 (citing Singh ¶¶ 82, 102));

“periodically bulk processing the plurality of scenarios in batch to generate forecasts comprising: for each scenario, checking newly collected data to determine whether to adjust the recommended number of collected data points when the newly collected data comprises an outlier data point that exceeds the confidence guardbands” (Final Act. 24 (citing Singh ¶¶ 21, 74));  
and

“wherein adjusting the recommended number of collected data points comprises including at least two subsequent data points to ensure that the outlier data point is not the last point in a time series” (Final Act. 24–25 (citing Singh ¶¶ 84, 85)).

The Examiner finds Moessner teaches or suggests “optimizing the bulk processing by only forecasting scenarios in the plurality of scenarios that exceed the adjusted recommended number of collected data points, exceed the cap on time to elapse, or have where at least three future data points that fall outside the one or more confidence guardbands.” Final Act. 26–27 (citing Moessner ¶¶ 16, 52, 53, 56). The Examiner finds Lindquist teaches “a recommended number of collected data points that, once accumulated via

new data collection, should trigger computation of a forecast for the scenario” (Final Act. 28–29 (citing Lindquist ¶¶ 1, 62, 64, 66)) and “determining with one or more computer processors a cap on time to elapse since a most recent forecast of the scenario that, once elapsed, should trigger computation of the forecast” (Final Act. 29 (citing Lindquist ¶¶ 60, 77)). As such, the Examiner has established a prima facie case by indicating that the cited references render the claims obvious under 35 U.S.C. § 103(a) and citing to specific portions of the references believed to disclose the limitations recited in each claim. *See In re Jung* 637 F.3d 1356, 1363 (Fed. Cir. 2011). We agree with Appellants that the claims must be read as a whole, but to the extent Appellants argue that doing so precludes the Examiner from relying on more than one reference for teaching the disputed limitation, we disagree. *See In re Gorman*, 933 F.2d 982, 986, (Fed. Cir. 1991) (affirming an obviousness rejection based on multiple references because “[t]he criterion . . . is not the number of references, but what they would have meant to a person of ordinary skill in the field of the invention.”). Appellants have not provided sufficiently persuasive evidence of a claim interpretation requiring any of the recited limitations to be read as an indivisible limitation that cannot be taught by multiple references, nor have Appellants pointed to any case law requiring such a result.

We are also not persuaded by Appellants’ arguments that the Examiner “provides no reasoning to resolve the clear failure of the Kakouros-Singh-Moessner combination to disclose the above claim features in the ‘fashion claimed’” and “the Examiner only addresses portions of claim features and does not provide any rational underpinning for combination in terms of the claim as a whole.” App. Br. 17. We find the

Examiner provides the required articulated reasoning with rationale underpinning for combining the teachings of the cited references. *See* Final Act. 25–26 (finding it would be obvious to modify the teachings of Kakouros with the teachings of Singh), 27–28 (finding it would be obvious to modify the combined teachings of Kakouros and Singh with the teachings of Moessner), 29–30 (finding it would be obvious to modify the combined teachings of Kakouros, Singh, and Moessner with the teachings of Lindquist). The Examiner’s findings are reasonable because the skilled artisan would “be able to fit the teachings of multiple patents together like pieces of a puzzle” since the skilled artisan is “a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 420, 421 (2007). Appellants do not present evidence that the resulting arrangement was “uniquely challenging or difficult for one of ordinary skill in the art” or “represented an unobvious step over the prior art.” *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418–19). Accordingly, we are unpersuaded the Examiner erred in finding the combination of Kakouros, Singh, Moessner, and Lindquist teaches or suggests the limitations recited in claim 1.

For the foregoing reasons, we are unpersuaded the Examiner erred in rejecting claim 1.

Regarding the rejection of claims 2–8, 10–23, and 25–29, because Appellants have either not presented separate patentability arguments or have reiterated substantially the same arguments as those previously discussed for patentability of claim 1 above (*see* App. Br. 20–21), we are not persuaded the Examiner erred in rejecting claims 2–8, 10–23, and 25–29

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under 35 U.S.C. § 103(a) for the reasons discussed *supra* with respect to claim 1.

#### DECISION

We affirm the Examiner's rejection of claims 1–8, 10–23, and 25–29 under 35 U.S.C. § 101.

We affirm the Examiner's rejections of claims 1–8, 10–23, and 25–29 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED