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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MURRAY TODD WILLIAMS

Appeal 2020-002526
Application 14/857,412
Technology Center 3600

Before LARRY J. HUME, CATHERINE SHIANG, and
MATTHEW J. McNEILL, *Administrative Patent Judges*.

HUME, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner’s decision rejecting claims 21–23, 25–27, 29–32, and 34–35, which are all claims pending in the application. Appellant has canceled claims 1–20, 24, 28, and 33. *See* Appeal Br. 37 *et seq.* (Claims App.). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ We use the term “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Accenture Global Services Limited. Appeal Br. 3.

STATEMENT OF THE CASE²

The claims are directed to a service oriented architecture optimization system and method. *See* Spec. (Title). In particular, Appellant's disclosed embodiments and claimed invention relate to:

A multivariate business process modeling or management (BPM) optimization system and method for optimizing a BPM system includes a logic layer to control operation of the BPM system, a utility layer to implement a randomized experimental treatment based on a hypothesis, and a persistence layer to collect data from application of the randomized experimental treatment to the BPM system. The multivariate BPM optimization system and method optimizes the BPM system by computerized testing of the hypothesis and generation of results to add, remove or modify a step or modify a point in a flow of the BPM system based on the data collected from application of the randomized experimental treatment.

Spec. 35 (Abstr.).

² Our decision relies upon Appellant's Appeal Brief ("Appeal Br.," filed Oct. 28, 2019); Reply Brief ("Reply Br.," filed Feb. 10, 2020); Examiner's Answer ("Ans.," mailed Dec. 20, 2019); Non-Final Office Action ("Non-Final Act.," mailed Apr. 29, 2019); and the original Specification ("Spec.," filed Sept. 17, 2015) (claiming benefit of US 13/047,985, filed Mar. 15, 2011, now abandoned).

Exemplary Claim

Claim 21, reproduced below, is representative of the subject matter on Appeal (*emphases* added to dispositive prior-art limitations):

21. A service oriented architecture (SOA) optimization system to optimize an application service composition in a service oriented architecture (SOA), the system comprising:

an interface;

a hardware processor;

a storage device storing instructions that when executed by the hardware processor cause the hardware processor to:

identify a point in the application service composition to test;

determine an experiment for testing the application service composition at the identified point;

receive attributes for the experiment from a user via the interface, wherein the attributes are variables in the experiment;

provide an experimental rule for the SOA optimization system, wherein the experimental rule indicates that if a value of one of the attributes related to the user is below a certain threshold, the application service composition is to automatically disqualify the user;

randomly assign levels for each of the attributes;

implement the experiment on the application service composition by executing the application service composition based on the randomly assigned levels of the attributes and the experimental rule;

collect result data at the identified point from the implementation of the experiment on the application service composition based on each of the randomly assigned levels of the attributes;

determine treatments for the identified point in the application service composition based on the collected result data;

administer the treatments based on segment information provided for the experiment;

determine if at least one of the treatments is suboptimal prior to completion of the experiment based on analysis of outcomes of administering the at least one treatment during the experiment;

flag the at least one treatment as suboptimal while the experiment is running if the at least one treatment is determined to be suboptimal;

apply the treatments to the experiment;

change a flow of the application service composition as a result of applying the treatments to the experiment, including adding, removing, or modifying a particular point in the application service composition to optimize the application service composition;

capture and track data generated from the experiment;

generate a unique identifier (UID) to associate with the captured and tracked data generated from the experiment;

log the captured and tracked data generated from the experiment in association with the UID; and

generate a result of the experiment that specifies an optimal threshold value for the attribute related to the user at which to automatically disqualify the user based on the captured and tracked data generated from the experiment;

an instance cache to store the UID, the received attributes, the randomly assigned levels, and the captured and tracked data of the experiment; and a history cache to store output data of the experiment.

REFERENCES

The prior art relied upon by the Examiner as evidence is:

Name	Reference	Date
Honarvar et al. (“Honarvar”)	US 2004/0148211 A1	July 29, 2004
Liu et al. (“Liu”)	US 2010/0257009 A1	Oct. 7, 2010

REJECTIONS

R1. Claims 21–23, 25–27, 29–32, and 34–35 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 amounting to significantly more than the abstract idea itself. Non-Final Act. 10.

R2. Claims 21–23, 25–27, 29–32, and 34–35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Liu and Honarvar. Non-Final Act. 19.

CLAIM GROUPING

Based on Appellant’s arguments (Appeal Br. 12–35) and our discretion under 37 C.F.R. § 41.37(c)(1)(iv), we decide the appeal of patent-ineligible subject matter Rejection R1 of claims 21–23, 25–27, 29–32, and 34–35 on the basis of representative claim 21. We address the appeal of obviousness Rejection R2 of independent claims 21, 27, and 32, and dependent claims 22, 23, 25, 26, 29–31, 34, and 35 depending therefrom, *infra*.³

³ “Notwithstanding any other provision of this paragraph, the failure of appellant to separately argue claims which appellant has grouped together

ISSUES AND ANALYSIS

In reaching this decision, we consider all evidence presented and all arguments actually made by Appellant. To the extent Appellant has not advanced separate, substantive arguments for particular claims, or other issues, such arguments are waived. 37 C.F.R. §41.37(c)(1)(iv).

We agree with particular arguments set forth by Appellant with respect to obviousness Rejection R2 of claims 21–23, 25–27, 29–32, and 34–35.

However, we disagree with Appellant’s arguments with respect to subject matter eligibility Rejection R1 of claims 21–23, 25–27, 29–32, and 34–35 and, unless otherwise noted, we incorporate by reference herein and adopt as our own: (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken, and (2) the reasons and rebuttals set forth in the Examiner’s Answer in response to Appellant’s arguments. We highlight and address specific findings and arguments regarding claim 21 for emphasis as follows.

1. § 101 Rejection R1 of Claims 21–23, 25–27, 29–32, and 34–35

Issue 1

Appellant argues (Appeal Br. 14–28; Reply Br. 4–10) the Examiner’s rejection of claim 21 under 35 U.S.C. § 101 as being directed to patent-

shall constitute a waiver of any argument that the Board must consider the patentability of any grouped claim separately.” 37 C.F.R. § 41.37(c)(1)(iv). In addition, when Appellant does not separately argue the patentability of dependent claims, the claims stand or fall with the claims from which they depend. *In re King*, 801 F.2d 1324, 1325 (Fed. Cir. 1986).

ineligible subject matter is in error. These contentions present us with the following issue:

Under the USPTO’s Revised Guidance, informed by our governing case law concerning 35 U.S.C. § 101, is claim 1 patent-ineligible under § 101?

Principles of Law

A. 35 U.S.C. § 101

An invention is patent-eligible if it is a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101.⁴ However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[l]aws of nature, natural phenomena, and abstract ideas” are not patentable. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012) (brackets in original) (citing *Diamond v. Diehr*, 450 U.S. 175, 185 (1981)).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217–18 (2014) (citing *Mayo*, 566 U.S. at 75–77). In accordance with that framework, we first determine what concept the claim is “directed to.” See *Alice*, 573 U.S. at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement

⁴ This threshold analysis of whether a claim is directed to one of the four statutory categories of invention, *i.e.*, a process, machine, manufacture, or composition of matter, is referred to as “*Step 1*” in the USPTO’s patent-eligibility analysis under § 101. MPEP § 2106.

risk.”); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk . . .”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diehr*, 450 U.S. at 191); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

Abstract ideas may include, but are not limited to, fundamental economic practices, methods of organizing human activities, and mathematical formulas or relationships. *Alice*, 573 U.S. at 217–21. Under this guidance, we must therefore ensure at step one that we articulate what the claims are directed to with enough specificity to ensure the step one inquiry is meaningful. *Id.* at 217 (“[W]e tread carefully in construing this exclusionary principle lest it swallow all of patent law.”).

Examples of claims that do not recite mental processes because they cannot be practically performed in the human mind include: (a) a claim to a method for calculating an absolute position of a GPS receiver and an absolute time of reception of satellite signals, where the claimed GPS

receiver calculated pseudoranges that estimated the distance from the GPS receiver to a plurality of satellites, *SiRF Technology, Inc. v. International Trade Commission*, 601 F.3d 1319, 1331–33 (Fed. Cir. 2010); (b) a claim to detecting suspicious activity by using network monitors and analyzing network packets, *SRI Int’l, Inc. v. Cisco Systems, Inc.*, 930 F.3d 1295, 1304 (Fed. Cir. 2019); (c) a claim to a specific data encryption method for computer communication involving a several-step manipulation of data, *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016) (distinguishing *TQP Development, LLC v. Intuit Inc.*, 2014 WL 651935 (E.D. Tex. Feb. 19, 2014)) (the specific data encryption method “could not conceivably be performed in the human mind or with pencil and paper”). Whereas a claim limitation to a process that “can be performed in the human mind, or by a human using a pen and paper” qualifies as a mental process, a claim limitation that “could not, as a practical matter, be performed entirely in a human’s mind” (even if aided with pen and paper) would not qualify as a mental process.⁵

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held “[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 187; *see also id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula.”). Having

⁵ *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372, 1375-76 (Fed. Cir. 2011) (distinguishing *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010), and *SiRF Tech., Inc. v. Int’l Trade Comm’n*, 601 F.3d 1319 (Fed. Cir. 2010)).

said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.” *Id.* (citation omitted) (citing *Benson* and *Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine 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*, 573 U.S. at 221 (citation omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (alterations in original) (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

B. USPTO Revised Guidance

The PTO published revised guidance in the Federal Register concerning the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (hereinafter “Revised Guidance”) (<https://www.govinfo.gov/content/pkg/FR-2019-01-07/pdf/2018-28282.pdf>). “All USPTO personnel are, as a matter of internal agency management, expected to follow the guidance.” *Id.* at 51; *see also* October

2019 Update at 1 (*October 2019 Update: Subject Matter Eligibility*)
(hereinafter “October 2019 Update”).

Under the Revised Guidance, we first look to whether the claim recites:

(1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes);⁶ and

(2) additional elements that integrate the judicial exception into a practical application (*see* Manual for Patent Examining Procedure (“MPEP”) §§ 2106.05(a)–(c), (e)–(h)).⁷

See Revised Guidance 52–53.

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.⁸

See Revised Guidance 56.

⁶ Referred to as “*Revised Step 2A, Prong 1*” in the Revised Guidance (hereinafter “*Step 2A(i)*”).

⁷ Referred to as “*Revised Step 2A, Prong 2*” in the Revised Guidance (hereinafter “*Step 2A(ii)*”).

⁸ Items (3) and (4) continue to be collectively referred to as “*Step 2B*” of the Supreme Court’s two-step framework, described in *Mayo* and *Alice*.

Step 2A(i) – Abstract Idea

Informed by our judicial precedent, the Revised Guidance extracts and synthesizes key concepts identified by the courts as abstract ideas to explain that the abstract idea exception includes the following groupings of subject matter, when recited as such in a claim limitation:

(a) Mathematical concepts—mathematical relationships, mathematical formulas or equations, mathematical calculations;

(b) Certain methods of organizing human activity — fundamental economic principles or practices (including hedging, insurance, mitigating risk); commercial or legal interactions (including agreements in the form of contracts; legal obligations; advertising, marketing or sales activities or behaviors; business relations); managing personal behavior or relationships or interactions between people (including social activities, teaching, and following rules or instructions); and

(c) Mental processes—concepts performed in the human mind (including an observation, evaluation, judgment, opinion).

Revised Guidance 52 (footnotes omitted).

Under the Revised Guidance, if the claim does not recite a judicial exception (a law of nature, natural phenomenon, or subject matter within the enumerated groupings of abstract ideas above), then the claim is patent-eligible at *Step 2A(i)*. This determination concludes the eligibility analysis, except in situations identified in the Revised Guidance.⁹

⁹ In the rare circumstance in which an examiner believes a claim limitation that does not fall within the enumerated groupings of abstract ideas should nonetheless be treated as reciting an abstract idea, the procedure described in of the Guidance for analyzing the claim should be followed. *See* Revised Guidance, Section III.C.

However, if the claim recites a judicial exception (i.e., an abstract idea enumerated above, a law of nature, or a natural phenomenon), the claim requires further analysis for a practical application of the judicial exception in *Step 2A(ii)*.

Step 2A(ii) – Practical Application

If a claim recites a judicial exception in *Step 2A(i)*, we determine whether the recited judicial exception is integrated into a practical application of that exception in *Step 2A(ii)* by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements, along with the limitations that recite a judicial exception, individually and in combination to determine whether they integrate the exception into a practical application.

The seven identified “practical application” sections of the MPEP,¹⁰ cited in the Revised Guidance under *Step 2A(ii)*, are:

- (1) MPEP § 2106.05(a) Improvements to the Functioning of a Computer or To Any Other Technology or Technical Field
- (2) MPEP § 2106.05(b) Particular Machine
- (3) MPEP § 2106.05(c) Particular Transformation
- (4) MPEP § 2106.05(e) Other Meaningful Limitations

¹⁰ See MPEP § 2106.05(a)–(c), (e)–(h). Citations to the MPEP herein refer to revision [R-08.2017]. Sections 2106.05(a), (b), (c), and (e) are indicative of integration into a practical application, while § 2106.05(f), (g), and (h) relate to limitations that are not indicative of integration into a practical application.

- (5) MPEP § 2106.05(f) Mere Instructions To Apply An Exception
- (6) MPEP § 2106.05(g) Insignificant Extra-Solution Activity
- (7) MPEP § 2106.05(h) Field of Use and Technological Environment

See Revised Guidance 55.

If the recited judicial exception is integrated into a practical application as determined under one or more of the MPEP sections cited above, then the claim is not directed to the judicial exception, and the patent-eligibility inquiry ends. *See Revised Guidance 54.* If not, then analysis proceeds to *Step 2B*.

Step 2B – “Inventive Concept” or “Significantly More”

Under our reviewing courts’ precedent, it is possible that a claim that does not “integrate” a recited judicial exception under *Step 2A(ii)* is nonetheless patent eligible. For example, the claim may recite additional elements that render the claim patent eligible even though one or more claim elements may recite a judicial exception.¹¹ The Federal Circuit has held claims eligible at the second step of the *Alice/Mayo* test (USPTO *Step 2B*) because the additional elements recited in the claims provided “significantly more” than the recited judicial exception (e.g., because the additional elements were unconventional in combination).¹² Therefore, if a claim has been determined to be directed to a judicial exception under *Revised Step*

¹¹ *See, e.g., Diehr*, 450 U.S. at 187.

¹² *See, e.g., Amdocs, Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300, 1304 (Fed. Cir. 2016); *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1349–52 (Fed. Cir. 2016); *DDR Holdings v. Hotels.com, L.P.*, 773 F.3d 1245, 1257–59 (Fed. Cir. 2014).

2A, we must also evaluate the additional elements individually and in combination under *Step 2B* to determine whether they provide an inventive concept (i.e., whether the additional elements amount to significantly more than the exception itself).¹³

Under the Revised Guidance, we must consider in *Step 2B* whether an additional element or combination of elements: (1) “Adds a specific limitation or combination of limitations that are not well-understood, routine, conventional activity in the field, which is indicative that an inventive concept may be present;” or (2) “simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception, which is indicative that an inventive concept may not be present.” *See* Revised Guidance, Section III.B.¹⁴

¹³ The patent eligibility inquiry may contain underlying issues of fact. *Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1325 (Fed. Cir. 2016). In particular, “[t]he question of whether a claim element or combination of elements is well-understood, routine and conventional to a skilled artisan in the relevant field is a question of fact.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

¹⁴ In accordance with existing *Step 2B* guidance, an Examiner’s finding that an additional element (or combination of elements) is well understood, routine, conventional activity must be supported with at least one of the four specific types of evidence required by the USPTO *Berkheimer* Memorandum, as shown above. For more information concerning evaluation of well-understood, routine, conventional activity, *see* MPEP § 2106.05(d), as modified by the USPTO *Berkheimer* Memorandum (USPTO Commissioner for Patents Memorandum dated Apr. 19, 2018, “Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*)” (hereinafter “*Berkheimer Memo*”).

In the *Step 2B* analysis, an additional element (or combination of elements) is not well-understood, routine or conventional unless the examiner finds an evidentiary basis, and expressly supports a rejection in writing with, one or more of the following:

1. A citation to an express statement in the specification or to a statement made by an applicant during prosecution that demonstrates the well-understood, routine, conventional nature of the additional element(s). . . .
2. A citation to one or more of the court decisions discussed in MPEP § 2106.05(d)(II) as noting the well-understood, routine, conventional nature of the additional element(s).
3. A citation to a publication that demonstrates the well-understood, routine, conventional nature of the additional element(s). . . .
4. A statement that the examiner is taking official notice of the well-understood, routine, conventional nature of the additional element(s). . . .

See Berkheimer Memo 3–4.

If the Examiner or the Board determines under *Step 2B* that the element (or combination of elements) amounts to significantly more than the exception itself, the claim is eligible, thereby concluding the eligibility analysis.

However, if a determination is made that the element and combination of elements do not amount to significantly more than the exception itself, the claim is ineligible under *Step 2B*, and the claim should be rejected for lack of subject matter eligibility.

Analysis

Step 1 – Statutory Category

Claim 21, as a system (machine) claim, recites one of the enumerated categories of eligible subject matter in 35 U.S.C. § 101. Therefore, the issue before us is whether it is directed to a judicial exception without significantly more.

Step 2A(i): Does the Claim Recite a Judicial Exception?

In citing precedential support for relying upon the preamble of system claim 21 to determine what the claim is directed to, the Examiner determined the claim is directed to “an abstract idea to: ‘optimize an application service composition in a service oriented architecture (SOA) system’” (Non-Final Act. 11), and further concluded this abstract idea may be characterized under the Revised Guidance as “‘certain methods of organizing human activity — [1] fundamental economic principles or practices (including hedging . . . mitigating risk) . . . [2] commercial . . . interactions (including . . . business relations); managing personal behavior or relationships or interactions between people (including . . . following rules or instructions).’” Non-Final Act, 12 (quoting Revised Guidance at 52).

We conclude claim 21 does not recite the judicial exceptions of either natural phenomena or laws of nature. We evaluate, *de novo*, whether claim 21 recites an abstract idea based upon the Revised Guidance.

First, we look to the Specification to provide context as to what the claimed invention is directed to. In this case, the Specification discloses that the invention is directed to “MVT [MULTIVARIATE] OPTIMIZATION

OF BUSINESS PROCESS MODELING [“BPM”] AND MANAGEMENT.” Spec. 1 (Title). Further, “[t]he multivariate BPM optimization system may optimize the BPM system by computerized testing of the hypothesis and generation of results to add, remove or modify a step or modify a point in a flow of the BPM system based on the data collected from application of the randomized experimental treatment.” Spec. ¶4.

Appellant’s Abstract describes the invention as:

A multivariate business process modeling or management (BPM) optimization system and method for optimizing a BPM system includes a logic layer to control operation of the BPM system, a utility layer to implement a randomized experimental treatment based on a hypothesis, and a persistence layer to collect data from application of the randomized experimental treatment to the BPM system. The multivariate BPM optimization system and method optimizes the BPM system by computerized testing of the hypothesis and generation of results to add, remove or modify a step or modify a point in a flow of the BPM system based on the data collected from application of the randomized experimental treatment.

Spec. 35 (Abstract).

With respect to this phase of the analysis, Appellant argues the “claims recite a specific technical process that is performed to optimize an application service composition in a service oriented architecture (SOA)[.]” Appeal Br. 17.

In TABLE I below, we identify in *italics* the specific claim limitations in claim 21 that we conclude recite an abstract idea. We additionally identify in **bold** the additional (non-abstract) claim limitations that are generic computer components and techniques, and underline limitations representing extra or post-solution activity:

TABLE I

Independent Claim 21	Revised Guidance
<p>A service oriented architecture (SOA) optimization system to optimize an application service composition in a service oriented architecture (SOA), the system comprising:</p>	<p>A system (machine) is a statutory subject matter class. <i>See</i> 35 U.S.C. § 101. <i>See</i> 35 U.S.C. § 101 (“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.”).</p>
<p>[L1a] an interface; [L1b] a hardware processor; [L1c] a storage device</p>	<p>As claimed, an interface, a hardware processor, and a storage device represent generic computer components. <i>See, e.g.</i>, Spec. ¶¶ 51–52.</p>
<p>[L2] <u>storing instructions</u> that when executed by the hardware processor cause the hardware processor to:</p>	<p>Storing instructions (information) is insignificant extra-solution activity. 2019 Revised Guidance; <i>see also</i> MPEP § 2106.05(g).</p>
<p>[L3] <i>identify a point in the application service composition to test;</i></p>	<p>“[I]dentify[ing] a point . . . to test” is an abstract idea, i.e., an observation, evaluation, judgment, opinion” that could be performed as a mental process. <i>See</i> Revised Guidance 52.</p>
<p>[L4] <i>determine an experiment for testing the application service composition at the identified point;</i></p>	<p>“[D]etermin[ing] an experiment for testing” is an abstract idea, i.e., an observation, evaluation, judgment, opinion” which could be performed as a mental process. <i>See</i> Revised Guidance 52.</p>
<p>[L5] <u>receive attributes for the experiment from a user via the interface</u>, wherein the attributes are variables in the experiment;</p>	<p>Receiving information, i.e., “attributes for the experiment,” which are “variables in the experiment,” is merely insignificant extra-solution activity that does not add significantly more to the abstract idea to render the claimed</p>

Independent Claim 21	Revised Guidance
	<p>invention patent-eligible. Revised Guidance 55, n.31; <i>see In re Bilski</i>, 545 F.3d 943, 962 (Fed. Cir. 2008) (<i>en banc</i>), <i>aff'd on other grounds</i>, 561 U.S. 593 (2010) (“[T]he involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity”)</p>
<p>[L6] <i>provide an experimental rule for the SOA optimization system</i>, wherein the experimental rule indicates that if a value of one of the attributes related to the user is below a certain threshold, the application service composition is to automatically disqualify the user;</p>	<p>“[P]rovid[ing] an experimental rule . . . [to determine whether to] disqualify the user” is an abstract idea, i.e., “Certain methods of organizing human activity . . . including . . . interactions between people . . . in the form of . . . advertising, marketing or sales activities” or, alternatively, managing relationships by following rules or instructions. <i>See Revised Guidance 52.</i></p>
<p>[L7] <i>randomly assign levels for each of the attributes</i>;</p>	<p>“[R]andomly assign[ing] levels for each of the attributes [i.e., variables in the experiment]” is an abstract idea, i.e., an observation, evaluation, judgment, opinion” which could be performed as a mental process. <i>See Revised Guidance 52.</i></p>
<p>[L8] <i>implement the experiment on the application service composition by executing the application service composition based on the randomly assigned levels of the attributes and the experimental rule</i>;</p>	<p>“[I]mplement[ing] the experiment . . . based on the randomly assigned levels of the attributes and the experimental rule” is an abstract idea, i.e., an observation, evaluation, judgment, opinion” which could be performed as a mental process or, alternatively, is an abstract idea as certain methods of organizing human activity in the form of managing interactions using rules or instructions. <i>See Revised Guidance 52.</i></p>

Independent Claim 21	Revised Guidance
<p>[L9] <u>collect result data</u> at the identified point from the implementation of the experiment on the application service composition based on each of the randomly assigned levels of the attributes;</p>	<p>“[C]ollect[ing] result data,” i.e., data gathering, is insignificant extra-solution activity. Revised Guidance 55, n.31; <i>see also</i> MPEP § 2106.05(g).</p>
<p>[L10] <i>determine treatments</i> for the identified point in the application service composition <i>based on the collected result data</i>;</p>	<p>“[D]etermin[ing] treatments . . . based on the collected result data” is an abstract idea, i.e., an observation, evaluation, judgment, opinion” which could be performed as a mental process. <i>See</i> Revised Guidance 52.</p>
<p>[L11] <u>administer the treatments based on segment information provided for the experiment</u>;</p>	<p>“[A]dminister[ing] the treatments based on segment information provided” is insignificant extra-solution activity. Revised Guidance 55, n.31.</p>
<p>[L12] <i>determine if at least one of the treatments is suboptimal</i> prior to completion of the experiment <i>based on analysis of outcomes of administering the at least one treatment during the experiment</i>;</p>	<p>“[D]etermin[ing] if . . . one of the treatments is suboptimal . . . based on analysis of outcomes” is an abstract idea, i.e., an observation, evaluation, judgment, opinion” which could be performed as a mental process. <i>See</i> Revised Guidance 52.</p>
<p>[L13] <u>flag the at least one treatment as suboptimal</u> while the experiment is running if the at least one treatment is determined to be suboptimal;</p>	<p>“[F]lag[ging] the . . . treatment as suboptimal” is insignificant extra-solution activity. Revised Guidance 55, n.31.</p>
<p>[L14] <i>apply the treatments to the experiment</i>;</p>	<p>“[A]pply[ing] the treatments to the experiment” is an abstract idea, i.e., “Certain methods of organizing human activity . . . including . . . commercial interactions . . . in the form of . . . advertising, marketing or sales</p>

Independent Claim 21	Revised Guidance
	activities” or, alternatively, a fundamental economic practice. <i>See</i> Revised Guidance 52.
[L15] <i>change a flow of the application service composition as a result of applying the treatments to the experiment, including adding, removing, or modifying a particular point in the application service composition to optimize the application service composition;</i>	“[C]hang[ing] a flow of the application service composition as a result of applying the treatments to the experiment” is an abstract idea, i.e., “Certain methods of organizing human activity . . . including . . . commercial interactions . . . in the form of . . . advertising, marketing or sales activities” or, alternatively, a fundamental economic practice. <i>See</i> Revised Guidance 52.
[L16] <u>capture and track data</u> generated from the experiment;	“[C]aptur[ing] and track[ing] data,” i.e., data gathering, is insignificant extra-solution activity. Revised Guidance 55, n.31; see also MPEP § 2106.05(g).
[L17] <i>generate a unique identifier (UID) to associate with the captured and tracked data</i> generated from the experiment;	“[G]enerat[ing] a unique identifier . . . to associate with the . . . data” is an abstract idea, i.e., an observation, evaluation, judgment, opinion” which could be performed as a mental process. <i>See</i> Revised Guidance 52.
[L18] <u>log the captured and tracked data</u> generated from the experiment in association with the UID; and	Logging or storing data is insignificant post-solution activity. Revised Guidance 55, n.31; <i>see also</i> MPEP § 2106.05(g).
[L19] <u>generate a result of the experiment that specifies an optimal threshold value for the attribute related to the user at which to automatically disqualify the user based on the</u>	“[G]enerat[ing] a result,” i.e., generating information is insignificant post-solution activity. Revised Guidance 55, n.31; <i>see also</i> MPEP § 2106.05(g).

Independent Claim 21	Revised Guidance
<u>captured and tracked data</u> generated from the experiment;	
[L20] an instance cache to store the UID, the received attributes, the randomly assigned levels, and the captured and tracked data of the experiment; and a history cache to store output data of the experiment.	As claimed, “an instance cache” and “a history cache” storing various types of data represent generic computer elements and functionality. <i>See, e.g.</i> , Spec. ¶¶ 32–33.

Appeal Br. 37–39 (Claims App.).

Under the broadest reasonable interpretation standard,¹⁵ we conclude limitations L1 through L20 in claim 21 recite functions and steps that would ordinarily occur when optimizing an application service composition in a service oriented architecture (SOA). *See* Non-Final Act. 11–13. Other than computer-related aspects, and as identified in TABLE I, limitations L3, L4, L6–L8, L10, L12, L14, L15, and L17 recite abstract ideas, whether initiated person-to-person, on paper, or using a computer.

¹⁵ During prosecution, claims must be given their broadest reasonable interpretation when reading claim language in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Under this standard, we interpret claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

In light of the limitations above, evaluated in light of the Specification, we determine that claim 21, overall, recites certain methods of organizing human activity in the form of a commercial interaction, i.e., optimizing an application service composition in a service oriented architecture (SOA), which may also be performed by pen and paper. This type of activity, as recited in limitations L1 through L20, for example, and aside from any computer-related aspects, includes longstanding conduct that existed well before the advent of computers and the Internet, and could be carried out by a human with pen and paper. *See CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed. Cir. 2011) (“That purely mental processes can be unpatentable, even when performed by a computer, was precisely the holding of the Supreme Court in *Gottschalk v. Benson*.”).¹⁶

Thus, under *Step 2A(i)*, we agree with the Examiner that claim 21’s “service oriented architecture (SOA) optimization system to optimize an application service composition in a service oriented architecture (SOA)” recites numerous abstract ideas. We conclude claim 21, under our Revised Guidance, recites a judicial exception of certain methods of organizing

¹⁶ 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.” *Id.* at 1241. Further, “[t]he Board’s slight revision of its abstract idea analysis does not impact the patentability analysis.” *Id.* 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).

human activity, i.e., commercial interactions in the form of marketing or sales activities, and thus recites an abstract idea.

Step 2A(ii): Judicial Exception Integrated into a Practical Application?

If the claims are directed to a judicial exception, as we conclude above, we proceed to the “practical application” *Step 2A(ii)* in which we determine whether the recited judicial exception is integrated into a practical application of that exception by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application.

With respect to this phase of the analysis, Appellant argues:

[I]ndependent claim 21 recites a method to optimize the application service composition, in which the system implements an experiment at an identified point in the application service composition. When the system determines that a treatment applied to the experiment is suboptimal prior to the completion of the experiment, the system changes a flow of the application service composition, and generates a result that specifies an optimal threshold value for an attribute at which to automatically disqualify a user based on the data generated from the experiment.

Appeal Br. 23. “Based on the simultaneous testing or manipulation of the multiple processes, the system enables an improvement in the management process.” Appeal Br. 24 (citing Spec. ¶ 20).

Thus, the additional features recited above in independent claim 21, such as “determine if at least one of the treatments is suboptimal prior to completion of the experiment” and “change a flow of the application service composition as a result of applying the treatments to the experiment, including adding, removing, or modifying a particular point in the

application service composition,” provide an improvement in a computer-related Service Oriented Architecture (SOA) technology and integrate the alleged abstract idea into a practical application.

Appeal Br. 24.

As to the specific limitations, we find limitations L9 (“collect result data”) and L16 (“capture and track data”) recite insignificant data gathering. *See* MPEP § 2106.05(g). Data gathering, as performed by the steps or function in Appellant’s claims, is a classic example of insignificant extra-solution activity. *See, e.g., In re Bilski*, 545 F.3d 943, 963 (Fed. Cir. 2008) (en banc), *aff’d sub nom, Bilski v. Kappos*, 561 U.S. 593 (2010).

We also find limitations L2 (“storing instructions”), L5 (“receive attributes for the experiment from a user”), L11 (“administer the treatments based on segment information provided for the experiment”), L13 (“flag the at least one treatment as suboptimal”), L18 (“log the captured and tracked data”), and L19 (generate a result of the experiment that specifies an optimal threshold value for the attribute related to the user at which to automatically disqualify the user based on the captured and tracked data”) recite insignificant post solution activity. The Supreme Court guides that the “prohibition against patenting abstract ideas ‘cannot be circumvented by’ . . . adding ‘insignificant postsolution activity.’” *Bilski*, 561 U.S. at 610–11 (quoting *Diehr*, 450 U.S. at 191–92).

We conclude limitations L1a (“an interface”), [L1b] (“a hardware processor”), [L1c] (“a storage device”), and L20 (“an instance cache to store [data]” and “a history cache to store output data”) recite generic computer elements and functionality. On this record, we are of the view that

Appellant's claims do not operate the recited generic computer components in an unconventional manner to achieve an improvement in computer functionality. *See* MPEP § 2106.05(a).

We find the limitations of claim 1 above recite abstract ideas as identified in *Step 2A(i), supra*, and none of the limitations integrate the judicial exception of a service oriented architecture (SOA) optimization system to optimize an application service composition in a service oriented architecture (SOA) into a practical application as determined under one or more of the MPEP sections cited above. The claim as a whole merely uses instructions to implement the abstract idea on a computer or, alternatively, merely uses a computer as a tool to perform the abstract idea.

Under analogous circumstances, the Federal Circuit has held that “[t]his is a quintessential ‘do it on a computer’ patent: it acknowledges that [such] data . . . was previously collected, analyzed, manipulated, and displayed manually, and it simply proposes doing so with a computer. We have held such claims are directed to abstract ideas.” *Univ. of Fla. Research Found., Inc. v. Gen. Elec. Co.*, 916 F.3d 1363, 1367 (Fed. Cir. 2019); *see also Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1351 (Fed. Cir. 2016) (“Though lengthy and numerous, the claims do not go beyond requiring the collection, analysis, and display of available information in a particular field, stating those functions in general terms, without limiting them to technical means for performing the functions that are arguably an advance over conventional computer and network technology.”).

Therefore, the claim as a whole merely uses instructions to implement the abstract idea on a computer or, alternatively, merely uses a computer as a tool to perform the abstract idea. Thus, on this record, Appellant has not

shown an improvement or practical application under the guidance of MPEP section 2106.05(a) (“Improvements to the Functioning of a Computer or to Any Other Technology or Technical Field”) or section 2106.05(e) (“Other Meaningful Limitations”). Nor does Appellant advance any arguments in the Brief(s) that are directed to the *Bilski* machine-or-transformation test, which would only be applicable to the method (process) claims on appeal. See MPEP §§ 2106.05(b) (Particular Machine) and 2106.05(c) (Particular Transformation).

Therefore, we conclude the abstract idea is not integrated into a practical application, and thus claim 21 is directed to the judicial exception.

Step 2B – “Inventive Concept” or “Significantly More”

If the claims are directed to a judicial exception, and not integrated into a practical application, as we conclude above, we proceed to the “inventive concept” step. For *Step 2B* we must “look with more specificity at what the claim elements add, in order to determine ‘whether they identify an “inventive concept” in the application of the ineligible subject matter’ to which the claim is directed.” *Affinity Labs*, 838 F.3d at 1258.

In applying step two of the *Alice* analysis, our reviewing court guides we must “determine whether the claims do significantly more than simply describe [the] abstract method” and thus transform the abstract idea into patentable subject matter. *Ulramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014). We look to see whether there are any “additional features” in the claims that constitute an “inventive concept,” thereby rendering the claims eligible for patenting even if they are directed to an abstract idea. *Alice*, 573 U.S. at 221. Those “additional features” must be

more than “well-understood, routine, conventional activity.” *Mayo*, 566 U.S. at 79.

Limitations referenced in *Alice* that are not enough to qualify as “significantly more” when recited in a claim with an abstract idea include, as non-limiting or non-exclusive examples: adding the words “apply it” (or an equivalent) with an abstract idea¹⁷; mere instructions to implement an abstract idea on a computer¹⁸; or requiring no more than a generic computer to perform generic computer functions that are well-understood, routine and conventional activities previously known to the industry.¹⁹

With respect to this phase of the analysis, Appellant argues additional elements recited in the claims provide significantly more than an abstract idea because the additional elements are unconventional in combination.

Appeal Br. 27. Appellant further argues:

As shown below in the arguments against the § 103 rejection, the combination of features recited above in independent claims 21, 27, and 32 is not taught or suggested by the prior art. As such, the combination of features recited in independent claims 21, 27, and 32 constitutes a non-conventional and non-generic arrangement of the additional elements recited in the claims. Accordingly, based on the 2019 PEG, the additional features recited above in independent claims 21, 27, and 32 amount to significantly more than an abstract idea. Thus, independent claims 21, 27, and 32 are statutory under 35 U.S.C. § 101.

Appeal Br. 28.

¹⁷ *Alice*, 573 U.S. at 221–23.

¹⁸ *Alice*, 573 U.S. at 222–23, *e.g.*, simply implementing a mathematical principle on a physical machine, namely a computer.

¹⁹ *Alice*, 573 U.S. at 225 (explaining using a computer to obtain data, adjust account balances, and issue automated instructions involves computer functions that are well-understood, routine, conventional activities).

With respect to Appellant’s argument concerning the purported novelty of the claimed invention, we note the Supreme Court emphasizes, “[t]he ‘novelty’ of any element or steps in a process, or even of the process itself, is of **no relevance** in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.” *Diehr*, 450 U.S. at 188–89 (emphasis added). Our reviewing court further guides that “[e]ligibility and novelty are separate inquiries.” *Two-Way Media Ltd. v. Comcast Cable Commc’ns, LLC*, 874 F.3d 1329, 1340 (Fed. Cir. 2017); *see also Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1263 (Fed. Cir. 2016) (holding that “[e]ven assuming” that a particular claimed feature was novel does not “avoid the problem of abstractness”).

Evaluating representative claim 21 under step 2 of the *Alice* analysis, we conclude it lacks an inventive concept that transforms the abstract idea of optimizing an application service composition in a service oriented architecture (SOA) into a patent-eligible application of that abstract idea.

The patent eligibility inquiry may contain underlying issues of fact. *Mortg. Grader*, 811 F.3d at 1325. In particular, “[t]he question of whether a claim element or combination of elements is well-understood, routine and conventional to a skilled artisan in the relevant field is a question of fact.” *Berkheimer*, 881 F.3d at 1368.

As evidence of the conventional nature of the recited **interface, hardware processor, storage device, an instance cache, and a history cache** in system claim 21, and similarly for method claim 27 and computer-readable medium claim 32, the Specification discloses:

[0051] Figure 4 shows a computer system 400 that may be used as a hardware platform for MVT BPM optimization system 100. Computer system 400 may be used as a platform for executing one or more of the steps, methods, modules, services and functions described herein that may be embodied as software stored on one or more computer readable mediums. The computer readable mediums may be non-transitory, such as storage devices including hardware.

[0052] Computer system 400 includes a processor 402 or processing circuitry that may implement or execute software instructions performing some or all of the methods, modules, services, functions and other steps described herein. Commands and data from processor 402 are communicated over a communication bus 404. Computer system 400 also includes a computer readable storage device 403, such as random access memory (RAM), where the software and data for processor 402 may reside during runtime. Storage device 403 may also include non-volatile data storage. Computer system 400 may include a network interface 405 for connecting to a network. It will be apparent to one of ordinary skill in the art that other known electronic components may be added or substituted in computer system 400.

Spec. ¶ 51–52.

Thus, because the Specification describes the additional elements in general terms, without describing the particulars, we conclude the claim limitations may be broadly but reasonably construed as reciting conventional computer components and techniques, particularly in light of Appellants' Specification, as quoted above.²⁰

²⁰ Claim terms are to be given their broadest reasonable interpretation, as understood by those of ordinary skill in the art and taking into account whatever enlightenment may be had from the Specification. *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

The MPEP, based upon our precedential guidance, provides additional considerations with respect to analysis of the well-understood, routine, and conventional nature of the recited computer-related components.

Another consideration when determining whether a claim recites significantly more than a judicial exception is whether the additional elements amount to more than a recitation of the words “apply it” (or an equivalent) or are more than mere instructions to implement an abstract idea or other exception on a computer. As explained by the Supreme Court, in order to transform a judicial exception into a patent-eligible application, the additional element or combination of elements must do “more than simply stat[e] the [judicial exception] while adding the words ‘apply it’”. *Alice Corp. v. CLS Bank*, 573 U.S. ___, 134 S. Ct. 2347, 2357, 110 USPQ2d 1976, 1982-83 (2014) (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 72, 101 USPQ2d 1961, 1965). Thus, for example, claims that amount to nothing more than an instruction to apply the abstract idea using a generic computer do not render an abstract idea eligible. *Alice Corp.*, 134 S. Ct. at 2358, 110 USPQ2d at 1983. *See also* 134 S. Ct. at 2389, 110 USPQ2d at 1984 (warning against a § 101 analysis that turns on “the draftsman’s art”)

In *Alice Corp.*, the claim recited the concept of intermediated settlement as performed by a generic computer. The Court found that the recitation of the computer in the claim amounted to mere instructions to apply the abstract idea on a generic computer. 134 S. Ct. at 2359-60, 110 USPQ2d at 1984. The Supreme Court also discussed this concept in an earlier case, *Gottschalk v. Benson*, 409 U.S. 63, 70, 175 USPQ 673, 676 (1972), where the claim recited a process for converting binary-coded decimal (BCD) numerals into pure binary numbers. The Court found that the claimed process had no substantial practical application except in connection with a computer. *Benson*, 409 U.S. at 71-72, 175 USPQ at 676. The claim simply stated a judicial exception (e.g., law of nature or abstract idea) while effectively adding words that “apply it” in a computer. *Id.*

MPEP § 2106.05(f) (“Mere Instructions To Apply An Exception”).

With respect to the *Step 2B* analysis, we conclude, similar to *Alice*, the recitation of a system that includes the generic computer components arranged as claimed is simply not enough to transform the patent-ineligible abstract idea here into a patent-eligible invention under *Step 2B*. *See Alice*, 573 U.S. at 221 (“[C]laims, which merely require generic computer implementation, fail to transform [an] abstract idea into a patent-eligible invention.”).

We conclude the claims fail the *Step 2B* analysis because claim 21, in essence, merely recites various computer-based elements along with no more than mere instructions to implement the identified abstract idea using the computer-based elements.

Therefore, in light of the foregoing, we conclude, under the Revised Guidance, that each of Appellant’s claims 21–23, 25–27, 29–32, and 34–35, considered as a whole, is directed to a patent-ineligible abstract idea that is not integrated into a practical application and does not include an inventive concept. Accordingly, we sustain the Examiner’s § 101 rejection of independent claim 21, and grouped claims 22, 23, 25–27, 29–32, and 34–35 which fall therewith. *See Claim Grouping, supra*.

2. § 103(a) Rejection R2 of Claims 21–23, 25–27, 29–32, and 34–35

Issue 2

Appellant argues (Appeal Br. 29–35; Reply Br. 11–16) the Examiner’s rejection of claim 21 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Liu and Honarvar is in error. These contentions present us with the following dispositive issue:

Did the Examiner err in finding the cited prior art teaches or suggests “[a] service oriented architecture (SOA) optimization system to optimize an application service composition in a service oriented architecture (SOA),” wherein the system includes “a storage device storing instructions that when executed by the hardware processor cause the hardware processor to,” *inter alia*, “receive attributes for the experiment from a user via the interface, wherein the attributes are variables in the experiment,” and “randomly assign levels for each of the attributes,” as recited in claim 21?

Analysis

The Examiner finds Liu teaches or suggests interfaces that receive “attributes for the experiment (*i. e.*, which to test), as well as stipulations of ‘Interval,’ ‘Adaptivity,’ and ‘Pool Threads’ as variables for the experiment.” Non-Final Act. 23 (citing Liu ¶ 57). The Examiner further finds Liu’s disclosure of “a simple workload generator which injects a number of requests into the system under test *with a bounded random time between request arrivals*” teaches or suggests randomly assigning levels for each of the attributes. Non-Final Act. 25 (citing Liu ¶ 97).

The Examiner alternatively finds that Honarvar, in addition to Liu, teaches or suggests the disputed limitation. Non-Final Act. 36.

“From step 150, the system also moves to step 160, where clients are grouped in a random manner into different test groups for the purpose of applying competing policy rules, strategy, or experiments. Thus, steps 155 and 160 can be seen as being performed in parallel and/or having no inter-dependency” (random assignment of test groups teaches random assignment of levels)

Non-Final Act. 36–37 (quoting Honarvar ¶ 26).

Appellant argues:

[T]he “random time” mentioned in Liu is a time for the workload generator to inject the requests into the system under test. However, injecting the requests into the system under test at a random time is not the same as randomly assigning a level for each of the attributes of an experiment. There is no correlation between the random time to inject requests into the system under test, as discussed in Liu, and randomly assigning levels for each attributes of an experiment, as recited in claim 21.

Appeal Br. 34.

Appellant further argues, “just because Liu mentions the word ‘random’ does not mean Liu discloses ‘randomly assign levels for each of the attributes’ as recited in claim 21. The ‘random’ in paragraph [0097] of Liu is ‘a bounded random time between request arrivals. For example, the interval [75,200] means the request arrival time bound is between 75 to 200 milliseconds.’”

With respect to the Examiner’s proffer of Honarvar as alternatively teaching or suggesting the disputed limitation, Appellant argues:

However, it is an unreasonable interpretation of Honarvar for the Examiner to equate “clients” of Honarvar to “attributes” of claim 21 and “different test groups” of Honarvar to “assigned levels” of claim 21 because, as recited in claim 21, the “attributes are variables in the experiment” “for testing the application service composition at the identified point.” The clients in Honarvar are not variables for testing an application service composition at an identified point. Thus, grouping clients in a random manner into different test groups, as discussed in Honarvar, is not equivalent to “randomly assign levels to each of the attributes” or “executing the application service composition based on the randomly assigned levels of the attributes and the experimental rule,” as recited in claim 21.

Reply Br. 15.

We are persuaded by Appellant’s argument that neither Liu nor Honarvar, alone or in combination, teach or suggest the dispositive limitation “randomly assign levels for each of the attributes”. We disagree with the Examiner’s contrary finding for essentially the same reasons articulated by Appellant, as quoted above.

Therefore, based upon the findings above, on this record, we are persuaded of at least one error in the Examiner’s reliance on the cited prior art to disclose the dispositive limitation of claim 21, such that we find error in the Examiner’s resulting conclusion of obviousness.

Accordingly, we do not sustain the Examiner’s obviousness Rejection R2 of independent claim 1, and independent claims 27 and 32 that recite the disputed limitations in commensurate form. For the same reasons, we do not sustain Rejection R2 of dependent claims 22, 23, 25, 26, 29–31, and 34–35 that variously and ultimately depend from claims 1, 27, and 32, and which stand therewith.²¹

REPLY BRIEF

To the extent Appellant *may* advance new arguments in the Reply Brief (Reply Br. 4–17) not in response to a shift in the Examiner’s position in the Answer, arguments raised in a Reply Brief that were not raised in the

²¹ Because we agree with at least one of the dispositive arguments advanced by Appellant, we need not reach the merits of Appellant’s other arguments. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (finding an administrative agency is at liberty to reach a decision based on “a single dispositive issue”).

Appeal Brief or are not responsive to arguments raised in the Examiner's Answer will not be considered except for good cause (*see* 37 C.F.R. § 41.41(b)(2)), which Appellant has not shown.

CONCLUSIONS

(1) Under our Revised Guidance, governed by relevant case law, claims 21–23, 25–27, 29–32, and 34–35 are patent-ineligible under 35 U.S.C. § 101, and we sustain the rejection.

(2) The Examiner erred with respect to obviousness Rejection R2 of claims 21–23, 25–27, 29–32, and 34–35 under 35 U.S.C. § 103(a) over the cited prior art combination of record, and we do not sustain the rejection.

Because we have affirmed at least one ground of rejection with respect to each claim on appeal, we affirm the Examiner's decision. *See* 37 C.F.R. § 41.50(a)(1).

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Basis / References	Affirmed	Reversed
21–23, 25–27, 29–32, 34–35	101	Subject Matter Eligibility	21–23, 25–27, 29–32, 34–35	
21–23, 25–27, 29–32, 34–35	103(a)	Obviousness Liu, Honarvar		21–23, 25–27, 29–32, 34–35
Overall Outcome			21–23, 25–27, 29–32, 34–35	

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FINALITY AND RESPONSE

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). See 37 C.F.R. § 41.50(f).

AFFIRMED