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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/177,385	02/11/2014	Zhenyu Yan	3854US01	1157
108982	7590	10/29/2018	EXAMINER	
Wolfe-SBMC 116 W. Pacific Avenue Suite 200 Spokane, WA 99201			CIRNU, ALEXANDRU	
			ART UNIT	PAPER NUMBER
			3681	
			NOTIFICATION DATE	DELIVERY MODE
			10/29/2018	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ZHENYU YAN, PRAVEEN KRISHNAKUMAR,
ABHISHEK PANI, ANIL KAMATH, SUMAN BASETTY,
and KUNAL KUMAR JAIN

Appeal 2017-007105
Application 14/177,385¹
Technology Center 3600

Before JOHN A. EVANS, LARRY J. HUME, and
JENNIFER L. MCKEOWN, *Administrative Patent Judges*.

HUME, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) of the Examiner's Final Rejection of claims 1–4, 7, 8, 10–18 and 20, which are all claims pending in the application. Appellants have canceled claims 5, 9, and 19. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ According to Appellants, the real party in interest is Adobe Systems Inc. App. Br. 3.

STATEMENT OF THE CASE²

The Invention

Appellants' disclosed embodiments and claimed invention relate to "[a]n ensemble model . . . that predicts revenue metrics for one or more keywords [and which] is formed using both a historical model and a user behavior model." Spec. ¶ 4.

Exemplary Claim

Claim 1, reproduced below, is representative of the subject matter on appeal (*emphases* added to contested prior-art limitations):

1. A method implemented by a computing device, the method comprising:

generating, by the computing device, a historical model that models historical data associated with performance of one or more keywords regarding revenue generated based on online advertising instances associated with the one or more keywords;

generating, by the computing device, a user behavior model separate and distinct from the historical model that models online user behavior associated with the one or more keywords;

estimating a first revenue prediction for the one or more keywords using the historical model;

estimating a second revenue prediction for the one or more keywords using the behavior model;

² Our decision relies upon Appellants' Appeal Brief ("App. Br.," filed Oct. 27, 2016); Reply Brief ("Reply Br.," filed Mar. 30, 2017); Examiner's Answer ("Ans.," mailed Feb. 10, 2017); Final Office Action ("Final Act.," mailed Apr. 28, 2016); and the original Specification ("Spec.," filed Feb. 11, 2014).

assigning a weight to the first revenue prediction based, at least in part, on a sparsity value indicating usefulness of the historical model to predict the performance of the one or more keywords;

assigning a weight to the second revenue prediction, the assigned weight of the second revenue prediction being, at least in part, related to the assigned weight of the first revenue prediction model;

forming, by the computing device, an ensemble model using the assigned weight of the first revenue prediction from the historical model and the assigned weight of the second revenue prediction from the user behavior model;

predicting, by the computing device, revenue metrics for the one or more keywords based at least in part on the ensemble model;

communicating, by the computing device and over a computer network, the predicted revenue metrics to an advertiser; and

causing the predicted revenue metrics for the one or more keywords to be presented to the advertiser.

Prior Art

The Examiner relies upon the following prior art as evidence in rejecting the claims on appeal:

Rifkin et al. ("Rifkin")	US 2008/0162386 A1	July 3, 2008
Parekh et al. ("Parekh")	US 2010/0076850 A1	Mar. 25, 2010
Agarwal et al. ("Agarwal")	US 7,734,503 B2	June 8, 2010
Bilenko et al. ("Bilenko")	US 2011/0295687 A1	Dec. 1, 2011
Tomak	US 8,260,680 B2	Sept.4, 2012
Synett et al. ("Synett")	US 2013/0204700 A1	Aug. 8, 2013
Anand et al. ("Anand")	US 2014/0129536 A1	May 8, 2014

*Rejections on Appeal*³

R1. Claims 1–4, 7, 8, 10–18 and 20–24 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Final Act. 2; Ans. 1.

R3. Claims 1–4, 7, 21, and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Synett, Agarwal, and Parekh. Final Act. 5.

R4. Claims 8, 11–13, and 23 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Synett, Agarwal, and Parekh. Final Act. 9.

R5. Claim 10 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Synett, Agarwal, and Rifkin. Final Act. 11.

R6. Claims 14, 15, 17, 20, and 24 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Synett and Tomak. Final Act. 12.

R7. Claim 16 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Synett, Tomak, and Bilenko. Final Act. 14.

R8. Claim 18 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Synett, Tomak, and Anand. *Id.*

³ We note the Examiner has withdrawn Rejection R2 (Final Act. 4) of claims 1, 8, 10, 14, and 21 under 35 U.S.C. § 112(b) as being indefinite. *See* Ans. 2.

CLAIM GROUPING

Based on Appellants' arguments (App. Br. 14–34), we decide the appeal of patent-ineligible subject matter Rejection R1 of claims 1–4, 7, 8, 10–18 and 20 on the basis of representative claim 1; we decide the appeal of obviousness Rejection R3 of claims 1–4, 7, 21, and 22 on the basis of representative claim 1; we decide the appeal of obviousness Rejection R4 of claims 8, 11–13, and 23 on the basis of representative claim 8; and we decide the appeal of obviousness Rejection R6 of claims 14, 15, 17, 20, and 24 on the basis of representative claim 14.

Remaining claims 10, 16, and 18 in Rejections R5, R7, and R8, not argued separately, stand or fall with the respective independent claim from which they depend.⁴

ISSUES AND ANALYSIS

In reaching this decision, we consider all evidence presented and all arguments actually made by Appellants. To the extent Appellants have 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 disagree with Appellants' arguments with respect to claims 1–4, 7, 8, 10–18 and 20 and, unless otherwise noted, we incorporate by reference herein and adopt as our own: (1) the findings and reasons set forth by the

⁴ "Notwithstanding any other provision of this paragraph, the failure of appellant to separately argue claims which appellant has grouped together 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 Appellants do 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).

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 Appellants' arguments. We highlight and address specific findings and arguments regarding claims 1, 8, and 14 for emphasis as follows.

1. § 101 Rejection R1 of Claims 1–4, 7, 8, 10–18 and 20

Issue 1

Appellants argue (App. Br. 15–24; Reply Br. 2–7) the Examiner's rejection of claim 1 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter is in error. These contentions present us with the following issue:

Under our governing case law concerning 35 U.S.C. § 101, did the Examiner err in concluding claim 1 is directed to a judicial exception, i.e., an abstract idea, without significantly more, and thus is patent-ineligible under § 101?

Analysis

Alice Framework

Section 101 provides that anyone who "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. 35 U.S.C. § 101. The Supreme Court has repeatedly emphasized that patent protection should not extend to claims that monopolize "the basic tools of scientific and technological work." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012); *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S.Ct. 2347, 2354 (2014).

Accordingly, laws of nature, natural phenomena, and abstract ideas are not patent-eligible subject matter. *Alice Corp.*, 134 S.Ct. at 2354.

The Supreme Court's two-part *Alice* framework guides us in distinguishing between patent claims that impermissibly claim the "building blocks of human ingenuity" and those that "integrate the building blocks into something more." *Alice Corp.*, 134 S.Ct. at 2354 (citation and bracketing omitted). First, we "determine whether the claims at issue are directed to [a] patent-ineligible concept[]." *Id.* at 2355. If so, we "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." *Id.* at 2357 (quoting *Mayo*, 566 U.S. at 72, 79). Although the two steps of the *Alice* framework are related, the "Supreme Court's formulation makes clear that the first-stage filter is a meaningful one, sometimes ending the § 101 inquiry." *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). We note the Supreme Court "has not established a definitive rule to determine what constitutes an 'abstract idea'" for the purposes of step one. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016) (citing *Alice*, 134 S. Ct at 2357).

In *Enfish*, our reviewing court held claims directed to a self-referential logical model for a computer database patent-eligible under step one of *Alice*. *Enfish*, 822 F.3d at 1330. The disclosed technique enabled faster searching and more effective storage of data than previous methods. *Id.* at 1333. The court found the claims directed to "a specific improvement to the way computers operate, embodied in the self-referential table" (*id.* at 1336), and explained that the claims are "not simply directed to *any* form of storing tabular data, but instead are specifically directed to a *self-referential table*

for a computer database" that functions differently than conventional databases. *Id.* at 1337.

In *McRO*, the claims were not held to be abstract because they recited a "specific . . . improvement in computer animation" using "unconventional rules that relate[d] sub-sequences of phonemes, timings, and morph weight sets." *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1302–03, 1307–08, and 1314–15 (Fed. Cir. 2016). In *McRO*, "the incorporation of the claimed rules, not the use of the computer," improved an existing technological process. *Id.* at 1314.

However, our reviewing court has held claims ineligible as directed to an abstract idea when they merely collect electronic information, display information, or embody mental processes that could be performed by humans. *Elec. Power Grp.*, 830 F.3d at 1353–54 (collecting cases). At the same time, "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Mayo*, 566 U.S. at 71. Abstract ideas may include, but are not limited to, fundamental economic practices, methods of organizing human activities, an idea of itself, and mathematical formulas or relationships. *Alice* 134 S.Ct. at 2355–57. 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 2354 ("[W]e tread carefully in construing this exclusionary principle lest it swallow all of patent law.").

Under the "abstract idea" step we must evaluate "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 (Fed. Cir. 2016) (citation omitted). If

the claims are not directed to a patent-ineligible concept, the inquiry ends. *See Visual Memory LLC v. NVIDIA Corp.*, 867 F.3d 1253, 1262 (Fed. Cir. 2017). If the concept is directed to a patent-ineligible concept, we proceed to the "inventive concept" step. For that second step 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 (quoting *Elec. Power Grp.*, 830 F.3d at 1353).

Alice Step 1 — Abstract Idea

The Examiner concludes the claims are directed to the abstract idea of "estimating keyword revenue using historical/behavior data." Final Act. 2. Similarly, the appealed claims "are directed towards predicting revenue metrics based on prediction modeling." Ans. 2.

Appellants generally contend, "the Office has failed to establish that the claims are patent-ineligible under §101 using the applicable framework adopted by the Supreme Court." App. Br. 15. "Further, the claims are not directed to an abstract idea, and include elements sufficient to ensure that the claims amount to significantly more than what the Office alleges is the abstract idea itself." *Id.*

Appellants specifically argue, "[t]he Office's conclusory statement fails to meet the first prong of the *Mayo* test because the Office fails to analyze the entire claim and instead simply attempts to summarize the claimed subject matter." App. Br. 16. Appellants continue by alleging, "[t]he Office Action does not even cite actual claim language in its conclusion that the claims are directed to an abstract idea, but rather, relies

on a conclusory summary of the claimed subject matter. Thus, the Office has failed to sufficiently establish under the first prong of *Mayo* that Applicant's claims are directed to an abstract idea." App. Br. 17.

Under the "abstract idea" step we must evaluate "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*, 838 F.3d at 1257 (citation omitted).

Turning to the claimed invention, claim 1 recites: "[a] method implemented by a computing device." Claim 1 (preamble). The limitations of method claim 1 also require the steps of:

- (a) generating . . . a historical model that models historical data;
- (b) generating . . . a user behavior model . . . that models online user behavior;
- (c) estimating a first revenue prediction . . . using the historical model;
- (d) estimating a second revenue prediction . . . using the behavior model;
- (e) assigning a weight to the first revenue prediction;
- (f) assigning a weight to the second revenue prediction;
- (g) forming . . . an ensemble model using the assigned weight of the first revenue prediction from the historical model and the assigned weight of the second revenue prediction from the user behavior mode";
- (h) "predicting . . . revenue metrics . . . based at least in part on the ensemble model;
- (i) communicating . . . the predicted revenue; and
- (j) causing the predicted revenue metrics for the one or more keywords to be presented.

Our reviewing courts have often identified abstract ideas by referring to earlier precedent, e.g., by comparing a claimed concept to the concepts previously identified as abstract ideas by the courts. *Amdocs (Israel), Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1294 (Fed. Cir. 2016); *Enfish*, 822 F.3d at 1334. For example, in *Alice*, the Supreme Court identified the claimed systems and methods as describing the concept of intermediated settlement, and then compared this concept to the risk hedging concept identified as an abstract idea in *Bilski*. Because this comparison revealed "no meaningful distinction between the concept of risk hedging in *Bilski* and the concept of intermediated settlement at issue here," the Court concluded that the concept of intermediated settlement was an abstract idea. *Alice*, 134 S.Ct. at 2356–57. Similarly, the Federal Circuit in *Amdocs* compared the claims at issue with "eligible and ineligible claims of a similar nature from past cases" as part of its eligibility analysis. *Amdocs*, 841 F.3d at 1295–1300.

Under step one, we agree with the Examiner that the invention claimed in independent claim 1 is directed to an abstract idea, i.e., estimating revenue using historical and behavior data, which we also conclude is a method of organizing human activity, specifically, concepts relating to advertising, marketing, and sales activities or behaviors. *See* Ans. 3.

We conclude claim 1 is directed to an abstract idea because it is analogous in key respects to *In re Maucorps*, 609 F.2d 481 (CCPA 1979), in which a computer-implemented model of a sales organization was determined to be directed to an abstract idea because it was implemented by using algorithms and data described in the specification to determine the

optimum number of times a sales representative for a business should visit each customer over a period of time, as well as the optimum organization of sales representatives. *Maucorps*, 609 F.2d at 486.

As the Specification discloses:

An ensemble model is described that predicts revenue metrics for one or more keywords. In one or more implementations, an ensemble model is formed using both a historical model and a user behavior model. The historical model may include historical data indicative of revenue generated from previous advertising instances associated with a keyword whereas the user behavior model may include data describing online user behavior associated with the keyword. In one or more implementations, weights are assigned to the historical model and/or the user behavior model based on sparsity of the historical data used to form the historical model. For example, if the historical data is rich (e.g., represents a high likelihood of accurately predicting revenues for the keyword), then a higher weight is assigned to the historical model relative to the weight assigned to the user behavior model.

Spec. ¶ 4.

We find this type of activity, i.e., estimating revenue using historical and behavior data, for example, 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*.").⁵

⁵ *CyberSource* further guides that "a method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101." *CyberSource*, 654 F.3d at 1373.

Our reviewing court has previously held other patent claims ineligible for reciting similar abstract concepts. For example, while the Supreme Court has enhanced the § 101 analysis since *CyberSource* in cases like *Mayo* and *Alice*, the Federal Circuit continues to "treat[] analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category." *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1146–47 (Fed. Cir. 2016) (quoting *Elec. Power Grp.*, 830 F.3d at 1354).

In addition, the Federal Circuit has concluded that abstract ideas include the concepts of collecting data, recognizing certain data within the collected data set, and storing the data in memory. *Content Extraction & Transmission LLC v. Wells Fargo Bank, N.A.*, 776 F.3d 1343, 1347 (Fed. Cir. 2014). Additionally, the collection of information and analysis of information (e.g., recognizing certain data within the dataset) are also abstract ideas. *Elec. Power Grp.*, 830 F.3d at 1353–54 (Collecting information and "analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, [are] essentially mental processes within the abstract-idea category."). Similarly, "collecting, displaying, and manipulating data" is an abstract idea. *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1340 (Fed. Cir. 2017). Also, collecting and comparing known information has been determined to be an abstract idea. *Classen Immunotherapies, Inc. v. Biogen IDEC*, 659 F.3d 1057, 1067 (Fed. Cir. 2011) ("Claim 1 of the '283 patent states the idea of collecting and comparing known information."). Further, a process that employs mathematical algorithms to manipulate existing information to generate additional information is abstract. *Digitech Image Techs., LLC v.*

Elec. for Imaging, Inc., 758 F.3d 1344, 1351 (Fed. Cir. 2014). Also, more recently, our reviewing court has also concluded that acts of parsing, comparing, storing, and editing data are abstract ideas. *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018).

Appellant also alleges claim 1 is patent-eligible because its practice does not preempt practice by others. App. Br. 23–24. We agree with the Examiner's response, which we incorporate herein by reference. Ans. 6. Regarding preemption, "[w]hile preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility. . . . Where a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework, as they are in this case, preemption concerns are fully addressed and made moot." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015); *see also OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362–63 (Fed. Cir. 2015) ("[T]hat the claims do not preempt all price optimization or may be limited to price optimization in the e-commerce setting do not make them any less abstract.").

Therefore, in agreement with the Examiner, we conclude claim 1 involves nothing more than identifying, collecting, storing, comparing, and generating data, without any particular inventive technology — an abstract idea. *See Elec. Power Grp.*, 830 F.3d at 1354.⁶

Accordingly, on this record, and under step one of *Alice*, we agree with the Examiner's conclusion the claims are directed to an abstract idea.

⁶ Merely automating previously manual processing by using computers does not qualify as an eligibility-rejection-defeating improvement. *Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1055 (Fed. Cir. 2017).

Alice Step 2 —Inventive Concept

If the claims are directed to a patent-ineligible concept, as we conclude above, we proceed to the "inventive concept" step of the *Alice* analysis. For that step 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 (quoting *Elec. Power Grp.*, 830 F.3d at 1353).

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*, 134 S.Ct. at 2357. Those "additional features" must be more than "well-understood, routine, conventional activity." *Mayo*, 566 U.S. at 79.

Evaluating representative claim 1 under step 2 of the *Alice* analysis, we agree with the Examiner that it lacks an inventive concept that transforms the abstract idea of estimating revenue using historical and behavior data into a patent-eligible application of that abstract idea. *See* Ans. 3–5.

For example, the Examiner concludes:

The claims as a whole, do not amount to significantly more than the abstract idea itself. This is because the claims do not effect an improvement to another technology or technical field; the claims do not amount to an improvement to the functioning of a computer itself; and the claims do not move beyond a general link of the use of an abstract idea to a particular technological environment.

The claims merely amounts to the application or instructions to apply the abstract idea (i.e. estimating keyword revenue using historical/behavior data) on a computer, and is considered to amount to nothing more than requiring a generic computer system (e.g. a computer system comprising generic elements such as a computer network, and hardware/software modules) to merely carry out the abstract idea itself. As such, the claims, when considered as a whole, are nothing more than the instruction to implement the abstract idea (i.e. estimating keyword revenue using historical/behavior data) in a particular, albeit well-understood, routine and conventional technological environment.

Final Act. 3–4 (emphasis omitted).⁷

⁷ The Examiner further concludes:

Claim 1 does not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional elements when considered both individually and as combination do not amount to significantly more than the abstract idea. The claim recites the additional elements of a computing device and a computer network, which represent generic computing elements.

These computing elements are recited at a high level of generality and only perform generic functions of receiving, manipulating and transmitting information. Generic computers performing generic functions, do not amount to significantly more than the abstract idea.

Additionally, Appellant's reliance on *DDR* (Reply Br. 5) is misplaced as the recited claims do not improve the *computer*. In *DDR*, the claims at issue involved, *inter alia*, "web pages displays [with] at least one active link associated with a commerce object associated with a buying opportunity of a selected one of a plurality of merchants" (claim 1 of US 7,818,399). The Federal Circuit found the claims in *DDR* to be patent-eligible under the *Mayo/Alice* test because "the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks." *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014). Specifically, the Federal Circuit found the claims addressed the "challenge of retaining control over the attention of the customer in the context of the Internet." *Id.* at 1258.

We find the rejected claims are dissimilar to *DDR*'s web page with an active link, and the Specification does not support the view that the computer related claim elements are unconventional. *See Spec.* ¶¶ 25–26 and 67–71.⁸

Looking at the elements as combination does not add anything more than the elements analyzed individually. Therefore, Claim 1 does not amount to significantly more than the abstract idea itself. The claim is not patent eligible.

Ans. 3–4.

⁸ Appellants belatedly and unpersuasively argue:

[T]his case is analogous to *DDR Holdings* . . . [because] the claimed subject matter utilizes a set of rules that enable users to apply an ensemble model with weighting to both historical and behavior models to predict keyword revenue, as reflected by the features of claim 1 noted above. It follows that the claimed solution is very much an "an improvement in computer-related technology" by "allowing computer performance of a function

In the Reply Brief, Appellants also belatedly argue the claims are similar to those held patent-eligible in *McRO*. Reply Br. 2 (citing *McRO*, 837 F.3d at 1299. The claims in *McRO* recited a "specific . . . improvement in computer animation" using "unconventional rules that relate[d] sub sequences of phonemes, timings, and morph weight sets." *McRO*, 837 F.3d at 1302–03, 1307–08, and 1314–15. In *McRO*, "the incorporation of the claimed rules, not the use of the computer," improved an existing technological process. *Id.* at 1314. Appellants do not, however, identify how claim 1 improves an existing technological process. *See Alice*, 134 S.Ct. at 2358 (Explaining that "the claims in *Diehr* were patent eligible because they improved an existing technological process."). Rather, claim 1 concerns a "method implemented by a computing device" that "caus[es] the predicted revenue metrics for the one or more keywords to be presented to the advertiser." App. Br. 36–37 (Claims App.). In addition, Appellants do not direct us to any evidence that the claimed generation of user and historical behavior models and revenue estimations correspond to unconventional rules.

not previously performable by a computer." Again, "[f]or example, if the historical data is rich (e.g., represents a high likelihood of accurately predicting revenues for the keyword), then a higher weight is assigned to the historical model relative to the weight assigned to the user behavior model" (Specification, [0003]). Thus, the claims solve a specific problem not addressed in the current art or previously performed by a computer. Applicant respectfully submits that the claims include features that amount to significantly more than an abstract idea and is therefore patent eligible for these additional reasons.

Reply Br. 6.

We also note 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*, 881 F.3d at 1368.

As evidence of the conventional nature of the claimed network components and processes, we note Appellant's Specification description of the computer system architecture in paragraphs 25–26 and 67–71. For example:

[0026] The computing device 102, for instance, may be configured as a desktop computer, a laptop computer, a mobile device (e.g., assuming a handheld configuration such as a tablet or mobile phone), and so forth. Thus, the computing device 102 may range from full resource devices with substantial memory and processor resources (e.g., personal computers, game consoles) to a low-resource device with limited memory and/or processing resources, e.g., mobile devices. Additionally, although a single computing device 102 is shown, the computing device 102 may be representative of a plurality of different devices, such as multiple servers utilized by a business to perform operations "over the cloud" as further described in relation to FIG. 6.

* * *

[0069] The processing system 604 is representative of functionality to perform one or more operations using hardware. Accordingly, the processing system 604 is illustrated as including hardware element 610 that may be configured as processors, functional blocks, and so forth. This may include implementation in hardware as an application specific integrated circuit or other logic device formed using one or

more semiconductors. The hardware elements 610 are not limited by the materials from which they are formed or the processing mechanisms employed therein. For example, processors may be comprised of semiconductor(s) and/or transistors, e.g., electronic integrated circuits (ICs). In such a context, processor-executable instructions may be electronically-executable instructions.

[0070] The computer-readable storage media 606 is illustrated as including memory/storage 612. The memory/storage 612 represents memory/storage capacity associated with one or more computer-readable media. The memory/storage component 612 may include volatile media (such as random access memory (RAM)) and/or nonvolatile media (such as read only memory (ROM), Flash memory, optical disks, magnetic disks, and so forth). The memory/storage component 612 may include fixed media (e.g., RAM, ROM, a fixed hard drive, and so on) as well as removable media, e.g., Flash memory, a removable hard drive, an optical disc, and so forth. The computer-readable media 606 may be configured in a variety of other ways as further described below.

Spec. ¶¶ 26, 69, and 70.

We agree with the Examiner that the claim limitations may be broadly but reasonably construed as reciting conventional computer components and techniques, particularly in light of Appellant's Specification, as quoted above.⁹

⁹ 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

Appellants also allege the claimed steps of method claim 1 "cause a transformation of the computer to a different state, thereby satisfying the second prong of the Mayo framework." App. Br. 21. Further,

the computer transforms data associated with the historical model and the online behavior model to form an ensemble model, and outputs, using the ensemble model, new data in the form of a predicted revenue metric. In addition, viewing the claim elements as an ordered combination, the steps cause improvements in the technology of revenue estimation techniques for keywords in the post Internet environment. That is, an improved revenue prediction metric for keywords is presented to an advertiser to enable the advertiser to make better decisions about how to allocate available resources to keywords.

App. Br. 21–22.

As recognized by the Federal Circuit in *Ultramerical, Inc. v. Hulu, LLC*, 772 F.3d 709, 715–16 (Fed. Cir. 2014), the "machine-or-transformation" (MoT) test, as outlined in *In re Bilski*, 545 F.3d 943, 954 (Fed. Cir. 2008), can provide a "useful clue" in the second step of the *Alice* framework.

Under *Bilski's* MoT test, a claimed process can be patent-eligible under § 101 if:

- (1) it is tied to a particular machine or apparatus; or
- (2) the process transforms a particular article into a different state or thing. *Bilski*, 545 F.3d at 954 (citing *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972)).

contained in the applicant's specification." *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

In this case, we are not persuaded the claimed method is tied to a particular machine or apparatus. *See e.g.*, Spec. ¶¶ 25–26, 67–71. Even assuming, *arguendo*, the claimed method satisfies the first prong of the MoT test, on this record we are not persuaded that the claimed method of manipulating and processing *data* is equivalent to changing a particular *article* into a different state or thing.

Thus, with respect to the Step 2 analysis, we agree with the Examiner because, as in *Alice*, the recitation of a "method implemented by a computing device" to determine and present predicted revenue metrics is simply not enough to transform the patent-ineligible abstract idea here into a patent-eligible invention. *See Alice*, 134 S. Ct. at 2357 ("[C]laims, which merely require generic computer implementation, fail to transform [an] abstract idea into a patent-eligible invention.").¹⁰

¹⁰ Appellants allege:

In particular, the claimed subject matter utilizes a set of rules that enable users to apply an ensemble model with weighting to both historical and behavior models to predict keyword revenue, as reflected by the features of claim 1 noted above. It follows that the claimed solution is very much an "an improvement in computer-related technology" by "allowing computer performance of a function not previously performable by a computer." Again, "[f]or example, if the historical data is rich (e.g., represents a high likelihood of accurately predicting revenues for the keyword), then a higher weight is assigned to the historical model relative to the weight assigned to the user behavior model" (Specification, [0003]). Thus, the claims solve a specific problem not addressed in the current art or previously performed by a computer.

Reply Br. 6.

Accordingly, based upon the findings above, on this record, we are not persuaded of error in the Examiner's conclusion that the appealed claims are directed to patent-ineligible subject matter. Therefore, we sustain the Examiner's § 101 rejection of independent claim 1, and grouped claims 2–4, 7, 8, 10–18 and 20, not argued separately, and which fall therewith. *See Claim Grouping, supra.*

2. § 103 Rejection R3 of Claims 1–4, 7, 21, and 22

Issue 2

Appellants argue (App. Br. 25–29) the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) as being obvious over the combination of Synett, Agarwal, and Parekh is in error. These contentions present us with the following issue:

Did the Examiner err in finding the cited prior art combination teaches or suggests a "method implemented by a computing device" that includes, *inter alia*, the dispositive limitation of "generating, by the computing device, a user behavior model separate and distinct from the historical model that models online user behavior associated with the one or more keywords," as recited in claim 1?

Analysis

The Examiner cites Synett paragraph 276 as teaching or suggesting generation of a historical model "that models historical data associated with performance of one or more keywords regarding revenue generated based on online advertising instances associated with the one or more keywords."

Final Act. 5. The Examiner then relies upon paragraph 24 of Synett as teaching or suggesting generation of "a user behavior model separate and

distinct from the historical model that models online user behavior associated with the one or more keywords." Final Act. 6.

Appellants contend, "[i]n those sections [cited by the Examiner,] Synett describes a 'computerized prediction method for individual users based on user interactions history' and 'computing the performance assessment for the series of interactions associated with the selected user.'" App. Br. 26 (citing Synett ¶ 24).

Thus, the Examiner is using the "interactions" in Synett as comprising both the historical model and the user behavior model. There is only one model described in Synett that relies on the "interactions" to associate revenue with keywords. Applicant can find no mention of two "separate and distinct" models in Synett. Thus, Synett fails to teach or suggest, "generating, by the computing device, a user behavior model separate and distinct from the historical model that models online user behavior associated with the one or more keywords," as recited in claim 1.

App. Br. 26.

Based upon our review of the cited prior art and Appellants' arguments quoted above, we are persuaded that Synett does not teach or suggest that for it is offered.

Although Appellants make additional arguments with respect to alleged deficiencies of the cited prior art combination, we find the issue above to be dispositive to our Decision.¹¹

¹¹ 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").

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 combination to teach or suggest the disputed limitation of claim 1, such that we find error in the Examiner's resulting legal conclusion of obviousness. Therefore, we sustain the Examiner's obviousness rejection of independent claim 1, and grouped claims 2–4, 7, 21, and 22, which fall therewith. *See Claim Grouping, supra.*

3. Rejection R4 of Claims 8, 11–13, and 23

For essentially the same reasons argued by Appellants in connection with Rejection R2 of claim 1 in *Issue 2*, above, we reverse the Examiner's rejection of independent claim 8, which recites the disputed limitation in commensurate form. For the same reasons, we also reverse Rejection R4 of claims 11–13 and 23 that depend therefrom.

4. Rejections R6 of Claims 14, 15, 17, 20, and 24

For essentially the same reasons argued by Appellants in connection with Rejection R2 of claim 1 in *Issue 2*, above, we reverse the Examiner's rejection of independent claim 14, which recites the disputed limitation in commensurate form. For the same reasons, we also reverse Rejection R6 of claims 15, 17, 20, and 24 that depend therefrom.

5. Rejections R5, R7, and R8 of Claims 10, 16, and 18

In light of our reversal of the rejections of independent claims 8 and 14, *supra*, we also reverse obviousness Rejections R5, R7, and R8 under § 103 of claims 10, 16, and 18, which variously and ultimately depend from claims 8 and 14. On this record, the Examiner has not shown how the additionally cited secondary Rifkin, Bilenko, and Anand references

overcome the aforementioned deficiencies with Synett, as discussed above regarding claims 8 and 14.

REPLY BRIEF

To the extent Appellants *may* advance new arguments in the Reply Brief (Reply Br. 2–7) not in response to a shift in the Examiner's position in the Answer,¹² we note arguments raised in a Reply Brief that were not raised in the 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 Appellants have not shown.

CONCLUSIONS¹³

(1) The Examiner did not err with respect to patent-ineligible subject matter Rejection R1 of claims 1–4, 7, 8, 10–18 and 20 under 35 U.S.C. § 101, and we sustain the rejection.

(2) The Examiner erred with respect to obviousness Rejection R3 through R8 of claims 1–4, 7, 8, 10–18 and 20 under 35 U.S.C. § 103(a) over the cited prior art combinations of record, and we do not sustain the rejections.

¹² For example, we observe Appellants, for the first time in the Reply Brief, belatedly argue the patentability of the claims rejected under Rejection R1 based upon *McRO* (decided Sept. 13, 2016), *Enfish* (decided May 12, 2016), and *DDR Holdings* (decided Dec. 5, 2014), all decided well before the filing of the Appeal Brief on October 27, 2016. *See* Reply Br. 2 *et seq.*

¹³ We reiterate that Rejection R2 under 35 U.S.C. § 112 has been withdrawn by the Examiner. Ans. 1.

Appeal 2017-007105
Application 14/177,385

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

We affirm the Examiner's decision rejecting claims 1–4, 7, 8, 10–18 and 20.

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