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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HUAJING LI, YANXIN SHI, ROHIT DHAWAN,
RICHARD BILL SIM, RONG YAN, and DAVID DAWEI YE

Appeal 2019-003274
Application 13/297,117
Technology Center 3600

Before BRADLEY W. BAUMEISTER, PHILLIP A. BENNETT, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

BENNETT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the
Examiner's decision to reject claims 1–7, 9, 17, 18, and 28–31.^{2,3} Claims 8,

¹ We use the word “Appellant” to refer to “applicant” as defined in
37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as
Facebook, Inc. Appeal Br. 2.

² We note Appellant failed to include page numbering in both the Appeal Brief
and Reply Brief. As such, our citations to these documents reference them
as though the pages were numbered with the first page as page 1.

³ We further note Appellant filed the wrong claims with the Appeal Brief
and made arguments directed to those wrongly filed claims. The claims

10–16, and 19–27 are cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

CLAIMED SUBJECT MATTER

The claims are directed to generating clusters of similar users for advertisement targeting. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method comprising:

maintaining a plurality of ad objects in a social networking system corresponding to a plurality of advertisements for display to users of the social networking system;

maintaining a plurality of user profile objects in a social networking system, the plurality of user profile objects associated with a plurality of users of the social networking system;

receiving a graphical interface displaying a selection of targeting criteria for an advertisement from an advertiser, wherein the targeting criteria of the advertisement indicate one or more actions performed by users in the social networking system;

transmitting the advertisement for presentation to viewing users in a targeting cluster of users that interact with the social networking system, the targeting cluster of users selected by:

for each user of a first subset of users of the social networking system,

included with the Appeal Brief included non-entered amendments from Appellant’s after-final response. Our references to the claims herein are made to the claims that are currently of record—the claims as amended in the Office Action response captioned AMENDMENT C, filed by Appellant on December 18, 2017 (“OA Response”).

assigning the user to a bin of a set of bins according on a past engagement history of the user with advertisers;

comparing the features defined by a user model with features for the user;

computing a confidence score based on a number of features for the user that match the features defined by the user model, the confidence score proportional to the number of matching features; and

selecting from each bin of the set of bins a predetermined number of users having highest confidence scores for the targeting cluster of users;

wherein the user model is generated by:

determining, by a processor, a training cluster of users for the advertisement based on the selection of the targeting criteria, comprising,

selecting as the training cluster of users those users of a second subset of users of the social networking system that have user profile objects indicating a threshold number of actions performed that match the actions indicated by the targeting criteria, the second subset of users of the social networking system distinct from the first subset of users of the social networking system;

generating the user model from the training cluster of users, the user model representative of the training cluster of users and including features of the users of the training cluster of users that are common to the users of the training cluster of users and which are extracted from the user profile objects of the users of the training cluster the generation of the user model comprising:

selecting features for the user model to include selected social graph features, each social graph feature indicating one or more connections to users in the training set of users, the connections stored in a social graph of the social networking system, such that users that match a social graph feature have connections to the users in the training

set of users matching the connections indicated in the social graph feature;

training an optimizer model with a training set of data, the optimizer model using a machine learning algorithm, the input features of the training set of data including the features for historical viewing users previously presented with the advertisement, the output labels of the training set of data including a conversion rate of the historical viewing users, the optimizer model generating weightings for each of the input features based on an effect of each input feature on the conversion rate; and

removing features from the user model matching the input features of the optimizer model that have corresponding weightings generated by the optimizer model that are below a threshold value.

OA Response 2–5.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Bentolila	US 8,046,797 B2	Oct. 25, 2011
Duan	US 2006/0224532 A1	Oct. 5, 2006
Kendall	US 2009/0119167 A1	May 7, 2009
Elvekrog	US 2011/0153423 A1	June 23, 2011
Bagherjeiran	US 2012/0054040 A1	Mar. 1, 2012

REJECTIONS

Claims 1–7, 9, 17, 18, and 28–31 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Final Act. 2–4.

Claims 1–7, 9, 17, 18, and 28–31 stand rejected under 35 U.S.C. § 101 as being directed to ineligible subject matter. Final Act. 4–12.

Claims 1–7, 9, 17, 18, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kendall, Bentolila, Bagherjeiran, and Duan. Final Act. 12–28.

Claims 29–31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kendall, Bentolila, Bagherjeiran, Duan, and Elvekrog. Final Act. 28–31.

REJECTION UNDER 35 U.S.C. § 112

The Examiner rejects the claims under 35 U.S.C. § 112, second paragraph, as being indefinite. Final Act. 2–4. Prior to filing the Appeal Brief, Appellant submitted proposed amendments seeking to address certain aspects of the indefiniteness rejection. The amendments were not entered by the Examiner. *See* Aug. 10, 2018 Advisory Act. 1–2. Despite the non-entry of the amendments, Appellant filed the amended claims together with the Appeal Brief. Appeal Br. 19–25.

Appellant argues against the indefiniteness rejection with reference to the claims as they appear in the erroneous claims appendix, and not to the claims as they actually stand in this record. *Compare* Appeal Br. 19–25 (claims appendix) *with* OA Response 2–7 (Listing of Claims). Because Appellant’s arguments do not address the actual language of the claims of record, they do not substantively address the rejection made. *See* Ans. 3–7. Accordingly, we summarily sustain the indefiniteness rejection of claims 1–7, 9, 17, 18, and 28–31 under 35 U.S.C. § 112, second paragraph.

REJECTION UNDER 35 U.S.C. § 101

Standard for Patent Eligibility

In issues involving subject matter eligibility, our inquiry focuses on whether the claims satisfy the two-step test set forth by the Supreme Court in *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208 (2014). The Court instructs us to “first determine whether the claims at issue are directed to a patent-ineligible concept,” *id.* at 218, and, in this case, the inquiry centers on whether the claims are directed to an abstract idea. If the initial threshold is met, we then move to the second step, in which we “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Id.* at 217–18 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 79, 78 (2012)). The Court describes the second step as a search for “an ‘inventive concept’”—*i.e.*, an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Id.* (quoting *Mayo*, 566 U.S. at 72–73).

The USPTO has published revised guidance on the application of § 101 consistent with *Alice* and subsequent Federal Circuit decisions. USPTO, *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Guidance”), updated by USPTO, *October 2019 Update: Subject Matter Eligibility* (available at https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf) (“October 2019 Guidance Update”).

Under the 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) (referred to Step 2A, prong 1 in the Guidance); and

(2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)) (referred to Step 2A, prong 2 in the Guidance).

See Guidance, 84 Fed. Reg. at 52–55. Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then move to Step 2B of the Guidance. There, we 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.

See Guidance, 84 Fed. Reg. at 56.

*Examiner’s Findings and Conclusions*⁴

The Examiner rejects claim 1 as being directed to a judicial exception without significantly more under *Alice*. Final Act. 4–12; Ans. 7–16. Under the first step of the *Alice* inquiry, the Examiner determines claim 1 recites a

⁴ The Final Office Action was mailed prior to the Guidance. The Final Office Action applied the case-law-based approach from previous eligibility guidance in rejecting the claims under § 101. Some of the documents in this appeal, including the Examiner’s Answer and Reply Brief, were filed subsequent to the issuance of the Guidance. The Examiner’s Answer updated the rejection to incorporate the procedure set forth in the Guidance, and we refer primarily to the arguments as updated by those findings and conclusions in the Answer.

judicial exception. Ans. 4–5. Specifically, the Examiner determines that “the claims at issue are directed . . . towards the idea of targeted advertising, which is a basic economic practice,” and the Examiner identifies the limitations reciting the judicial exception. Ans. 9. The Examiner determines the bulk of the remaining limitations in the claim relate to the use of machine learning to implement the abstract idea. Ans. 9–10.

The Examiner determines, “as is evident from Appellant’s original disclosure, no new or novel machine learning techniques are the subject of Appellant’s invention.” Ans. 10 (citing Spec. ¶¶ 15, 38, 41). The Examiner also concludes,

[These] steps appear to be directed simply towards applying well-known machine learning techniques in order to build and train a model with data from a training cluster of uses (the model called by the Appellant an “optimizer model”) which may be trained from historical data of users in the training cluster of users who have already seen and interacted with the advertisement, which is typical in machine learning.

Ans. 10.

The Examiner further supports the rejection by characterizing claim 1 as a process for collecting data, analyzing data, and displaying the results of that analysis—similar to claims found ineligible in prior cases. Ans. 11–12.

Under *Alice* step 2, the Examiner determines that the claims do not amount to significantly more than the abstract idea because:

[T]here is no indication in the record that any specialized computer hardware or other “inventive” computer components are required. In fact, the Specification explicitly discloses that the claimed invention is implemented using conventional computer system and standard communication technologies and protocols (see, e.g., Spec[.]¶0021). Furthermore, claim 1 merely employs generic computer components (i.e. a “processor” and a “social networking system”) to perform generic computer

functions (i.e., maintaining, receiving, determining, selecting), which is not enough to transform an abstract idea into a patent eligible invention.

Ans. 12–13.

The Examiner addresses the machine learning limitations, stating that they “are generally directed towards the implementation of machine learning (which is not Appellant’s invention as noted *supra*) for the purpose of collection and analysis of data used to select the users to whom the ad will be targeted which is not significantly more than the abstract idea of targeted advertising itself.” Ans. 13. The Examiner further cites *TLI Communications LLC v. A.V. Automotive, LLC*, 823 F.3d 607 (Fed. Cir. 2016) as evidence in support of the *Alice* step 2 determination. Ans. 14.

Appellant’s Contentions

Appellant presents several arguments for eligibility. Because the Guidance was issued after the Appeal Brief but before the Reply Brief, the arguments made in the Reply Brief focus on the application of the Guidance to the claims—and we primarily address those arguments herein. Appellant first argues the Examiner fails to identify the grouping under the Guidance to which the abstract idea belongs. Reply Br. 1. Appellant further argues the Examiner’s analysis of “machine learning” is flawed because “this abstract idea does not meet Prong One because ‘applying machine learning’ does not recite any of the judicial exceptions enumerated in the 2019 PEG.” Reply Br. 3.

Appellant further argues the Examiner errs under Step 2A, prong 2, because “[t]he claimed invention integrates ‘targeting advertisements’ into a practical application, and as such, the claims are not directed to this alleged abstract idea.” Reply Br. 4. Specifically, Appellant argues,

When considered as a whole, the claims are directed to a very specific computer implemented process of receiving targeting criteria of an advertisement from an advertiser and presenting the advertisement to a specific targeting cluster of users, where each user in the targeting cluster is selected based on a comparison of features associated with the user and features defined by a user model for the specified targeting criteria. Further, the user model is trained to select the features for defining the targeting cluster using a training cluster of users selected based on actions performed by the training cluster of users that match the advertiser specified targeting criteria.

Reply Br. 4.

Appellant also asserts the invention, as claimed, “is a practical application because the claims describe an improved technical solution for delivering an advertisement to a target group that is likely to be interested in the advertisement.” Reply Br. 5. Appellant also argues, “the claims use machine learning in specific ways recited through the various steps to improve a different technical field, namely online advertising and targeting content to users.” *Id.*

Under Step 2B, Appellant contends the Examiner failed to address of the additional limitations by “gloss[ing] over all of the remaining specific limitations of the claim and only mentions the hardware elements in the claim, concluding it to be generic.” Appeal Br. 9. Appellant also argues the Examiner failed to meet the fact-finding requirements outlined in the *Berkheimer Memorandum*. Appeal Br. 10–11; *see* USPTO, *Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (Berkheimer v. HP, Inc.)*, at 3–4, Apr. 19, 2018..

Revised Guidance, Step 2A, Prong One⁵
The Judicial Exception

Applying the Guidance, we are not persuaded the Examiner has erred in determining that the claims recite a judicial exception to patent eligible subject matter. The Guidance identifies three judicially-excepted groupings: (1) mathematical concepts, (2) certain methods of organizing human activity such as fundamental economic practices and commercial interactions (including . . . advertising, marketing or sales activities or behaviors; business relations), and (3) mental processes. We focus our analysis on the second and third groupings—certain methods of organizing human activity and mental processes.⁶

We conclude the limitations of claim 1 recite a process of delivering advertisement to selected recipients who are targeted according to a behavioral-based model, which amounts to a combination of abstract ideas under the Guidance.⁷ For example, claim 1 recites (1) “receiving . . . a

⁵ Throughout this opinion, we give the claim limitations the broadest reasonable interpretation consistent with the Specification. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

⁶ Appellant’s arguments against the § 101 rejection are made to the claims generally. We treat claim 1 as representative. 37 C.F.R. § 41.37(c)(1)(iv) (2018) (“When multiple claims subject to the same ground of rejection are argued as a group or subgroup by Appellant, the Board may select a single claim from the group or subgroup and may decide the appeal as to the ground of rejection with respect to the group or subgroup on the basis of the selected claim alone.”).

⁷ *Recogni Corp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017) (“Adding one abstract idea . . . 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) (patent-ineligible claims were directed to a combination of abstract ideas).

selection of targeting criteria for an advertisement from an advertiser, wherein the targeting criteria of the advertisement indicate one or more actions performed by users of the social networking system,” and (2) “transmitting the advertisement for presentation to viewing users in a targeting cluster of users that interact with the social networking system.” These limitations recite the familiar commercial practice of receiving advertisements from advertisers and selecting the intended audience for receiving the advertisement, and delivering the advertisement to the intended audience.

Claim 1 also recites (3) “the targeting cluster of users selected by: for each user of a first subset of users of the social networking system,” (4) “assigning the user to a bin of a set of bins according on a past engagement history of the user with advertisers,” (5) “comparing the features defined by a user model with features for the user,” (6) “computing a confidence score based on a number of features for the user that match the features defined by the user model, the confidence score proportional to the number of matching features,” and (7) “selecting from each bin of the set of bins a predetermined number of users having highest confidence scores for the targeting cluster of users.” OA Response 2–5. These limitations recite the familiar practice of target selection in advertising, not meaningfully different from choosing customer to receive a mailed advertisement based on prior purchases made by the users, or selecting a particular television program on which to run ads because of the demographic characteristics of its typical audience. These limitation can also reasonably be characterized as a mental process because they could be performed by a person in their mind with the aid of pen and paper. *See* October 2019 Guidance Update at 9

(“A claim that encompasses a human performing the step(s) mentally with the aid of a pen and paper recites a mental process”) (emphasis omitted).

Under the Guidance, these limitations recite both a commercial interaction of advertising (a certain method of organizing human activity) and a mental process for identifying consumers to target with advertising. Accordingly, we conclude the claimed process of delivering advertisement to selected recipients who are targeted according to a behavioral-based model, as set forth in claim 1, *recites* judicial exceptions of both a mental process and of a commercial interaction, which is a certain method of organizing human activity under the Guidance.⁸

*Revised Guidance, Step 2A, Prong Two
Integration of the Judicial Exception into a Practical Application*

Having determined that claim 1 recites a judicial exception, our analysis under the Guidance turns now to determining whether claim 1 recites any additional elements that integrate the judicial exception into a practical application. *See* Guidance, 84 Fed. Reg. at 54–55 (citing MPEP § 2106.05(a)–(c), (e)–(h)).

⁸ As noted above, Appellant argues the Examiner fails to identify in which grouping the abstract idea belongs. Reply Br. 3. This argument is not persuasive, as the Examiner identified the limitations that recite the abstract idea. Ans. 9 (“the claims at issue are directed . . . towards the idea of targeted advertising, which is a basic economic practice”). Appellant further argues the Examiner’s analysis of “machine learning” is flawed because “this abstract idea does not meet Prong One because ‘applying machine learning’ does not recite any of the judicial exceptions enumerated in the 2019 PEG.” Reply Br. 2. This argument is not persuasive because the “machine learning” aspects of the claim are addressed under Prong 2 below.

Under the Guidance, limitations that are indicative of “integration into a practical application” include:

1. Improvements to the functioning of a computer, or to any other technology or technical field — *see* MPEP § 2106.05(a);
2. Applying the judicial exception with, or by use of, a particular machine — *see* MPEP § 2106.05(b);
3. Effecting a transformation or reduction of a particular article to a different state or thing — *see* MPEP § 2106.05(c); and
4. Applying or using the judicial exception in some other meaningful way beyond generally linking the use of the judicial exception to a particular technological environment, such that the claim as a whole is more than a drafting effort designed to monopolize the exception — *see* MPEP § 2106.05(e).

In contrast, limitations that are not indicative of “integration into a practical application” include:

1. Adding the words “apply it” (or an equivalent) with the judicial exception, or merely include instructions to implement an abstract idea on a computer, or merely uses a computer as a tool to perform an abstract idea — *see* MPEP § 2106.05(f);
2. Adding insignificant extra-solution activity to the judicial exception — *see* MPEP § 2106.05(g); and
3. Generally linking the use of the judicial exception to a particular technological environment or field of use — *see* MPEP § 2106.05(h).

See Guidance, 84 Fed. Reg. at 54–55 (“Prong Two”).

As shown above, most of the claim limitations in claim 1 recite abstract ideas. Additional to those abstract limitations, claim 1 recites that (a) various steps are performed in “a social networking system,” (b) targeting criteria is received in “a graphical user interface,” and (c) additional steps are performed “by a processor.” OA Response 2–5. We conclude that these limitations are insufficient to integrate the recited judicial exception into a practical application.

Each of these limitations merely recites the use of conventional computer technology to implement the otherwise abstract process on a computer and to display the output. It is well-established, however, that the use of generic technology to implement an abstract idea is insufficient to integrate it into a practical application. *See* MPEP 2106.05(f) (explaining that it is not indicative of integration into a practical application where the claims “merely include instructions to implement an abstract idea on a computer, or merely uses a computer as a tool to perform an abstract idea”).

Claim 1 additionally recites (d) “maintaining a plurality of ad objects in a social networking system corresponding to a plurality of advertisements for display to users of the social networking system,” and (e) “maintaining a plurality of user profile objects in a social networking system, the plurality of user profile objects associated with a plurality of users of the social networking system.” OA Response 2. These limitations do not integrate the abstract idea into a practical application because they are extra-solution activity. Specifically, they recite data gathering and storage operations which are incidental to the targeted advertising in the claim. MPEP § 2106.05(h) (“An example of pre-solution activity is a step of gathering data for use in a claimed process.”); *see also Content Extraction &*

Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n, 776 F.3d 1343, 1347 (Fed. Cir. 2014) (holding ineligible claims “drawn to the abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in a memory”).

Claim 1 also recites (f) “wherein the user model is generated by: determining, by a processor, a training cluster of users for the advertisement based on the selection of the targeting criteria, comprising,” (g) “selecting as the training cluster of users those users of a second subset of users of the social networking system that have user profile objects indicating a threshold number of actions performed that match the actions indicated by the targeting criteria, the second subset of users of the social networking system distinct from the first subset of users of the social networking system,” (h) “generating the user model from the training cluster of users, the user model representative of the training cluster of users and including features of the users of the training cluster of users that are common to the users of the training cluster of users and which are extracted from the user profile objects of the users of the training cluster the generation of the user model comprising,” (i) “selecting features for the user model to include selected social graph features, each social graph feature indicating one or more connections to users in the training set of users, the connections stored in a social graph of the social networking system, such that users that match a social graph feature have connections to the users in the training set of users matching the connections indicated in the social graph feature,” (j) “training an optimizer model with a training set of data, the optimizer model using a machine learning algorithm, the input features of the training set of data including the features for historical viewing users previously

presented with the advertisement, the output labels of the training set of data including a conversion rate of the historical viewing users, the optimizer model generating weightings for each of the input features based on an effect of each input feature on the conversion rate,” and (k) “removing features from the user model matching the input features of the optimizer model that have corresponding weightings generated by the optimizer model that are below a threshold value.” OA Response 3–5.

These limitations generally recite the use of machine learning to create the user model that serves as the basis for selecting the targets for the advertisement. We agree with the Examiner that these limitations are insufficient to integrate the abstract idea into a practical application. As explained by the Examiner, the machine learning concepts applied in Appellant’s claims are not novel, and can be reasonably seen as the conventional application of well-known machine learning concepts to build and train a model. Ans. 10.

Appellant’s Specification describes the use of machine learning in general terms, without any specifics about the algorithms employed in connection with the machine learning. *See, e.g.*, Spec. ¶¶ 15, 38, 41 (describing results of applying machine learning algorithms without specifics of the algorithms applied). Because of the high-level and general description, we do not discern in these limitations any improvements to the functioning of a computer, or to any other technology or technical field. MPEP § 2106.05(a). Rather, these additional limitations are more akin to examples “of limitations that the courts have described as merely indicating a field of use or technological environment in which to apply a judicial exception.” MPEP § 2106.05(h).

One example provided in MPEP § 2106.05(h) of merely indicating a field of use or technological environment is a step of “[i]dentifying the participants in a process for hedging risk as commodity providers and commodity consumers. MPEP § 2106.05(h)(ii) (citing *Bilski v. Kapps*, 561 U.S. 593, 595 (2010)). As the MPEP explains, “limiting the use of the process to these participants did no more than describe how the abstract idea of hedging risk could be used in the commodities and energy markets.” *Id.* Similarly here, the machine learning limitations are used merely to identify the targets for the abstract advertising process, and simply recite how targets are selected for the targeted advertising.⁹

Limitations (f) and (g), for example, recite the initial steps of generating a user model: determining an initial group of users to consider and selecting a more specific group of users to include in the user model according to keywords relevant to the advertising targeting criteria—such as user interests. Spec. ¶¶ 30–32. The Specification includes no description indicating that the selection is anything meaningfully more than applying routine data processing concepts to further the abstract advertising process recited in the claim. *See* MPEP § 2106.05(f) (not indicative of practical application where computer is used merely as a tool to perform an abstract idea). Limitations (h), (i), (j), and (k) recite using commonalities among the

⁹ We further note that although the Examiner did not do so, the machine learning limitations are recited at a high level and also could be properly characterized as a mental process because they recite steps that could be performed by a human in their mind via observation, exercising judgment, and with the aid of pen and paper. The “learning” aspect of a machine learning, is quintessentially a process carried out by a human in their mind—learning. *See* Guidance, 84 Fed. Reg. at 52.

selected cluster to generate and train the user model from which advertising targets are selected. These limitations also utilize a computer as a tool to generate the user model, and are described at a high level in the Specification. Spec. ¶¶ 32–38. In particular, the modules described in the Specification that perform the recited functions are described exclusively in functional terms, with the description revealing only what the modules do, but not how they do it. *See, e.g.*, Spec. 34–38 (describing various modules).

As we noted above, Appellant argues the claimed solution “is a practical application because the claims describe an improved technical solution for delivering an advertisement to a target group that is likely to be interested in the advertisement” and also because “the claims use machine learning in specific ways recited through the various steps to improve a different technical field, namely online advertising and targeting content to users.” Reply Br. 5. We disagree.

Appellant’s invention is focused on improving the commercial practice of targeted advertising using machine learning. Thus, purported improvement identified by Appellant is not to machine learning, but instead to targeted advertising and, therefore, is not an improvement to technology. The improvement provided by these so-called machine learning process steps improves the abstract idea itself. It is well-established, however, that improvements in the abstract idea are insufficient to confer eligibility on an otherwise ineligible claim. *SAP Am. Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1168 (Fed. Cir. 2018). We conclude claim 1 is *directed to* a judicial exception under step 2A, prong 2, of the Guidance.

The Inventive Concept – Step 2B

Having determined the claim is directed to a judicial exception, we proceed to evaluating whether claim 1 adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field (*see* MPEP § 2106.05(d)) or simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception. *See* Guidance, 84 Fed. Reg. at 56.

Our review of the Examiner’s rejection under Step 2B is guided by the *Berkheimer Memorandum*, which sets forth what fact finding requirements are applicable to rejections under § 101. Consistent with the *Berkheimer Memorandum*, we agree with the Examiner that claim 1 does not add specific limitations beyond what is well-understood, routine, and conventional.

Our analysis focuses largely on the same limitations addressed in Step 2A, prong 2, above. We agree with the Examiner that the additional limitations do not supply an inventive concept under Step 2B because the machine learning algorithms used in the claim are described at a high level without detail in the Specification. Spec. ¶¶ 15, 38, 41. This lack of detailed description evidences their well-understood, routine, and conventional nature.

Under Step 2B, Appellant contends the Examiner failed to address the additional limitations by “gloss[ing] over all of the remaining specific limitations of the claim and only mentions the hardware elements in the claim, concluding it to be generic.” Appeal Br. 9. We disagree. The Examiner addressed the remaining limitations in detail in the Answer. *See*,

e.g., Ans. 12–14 (addressing the remaining limitations and finding them to not recite significantly more than the abstract idea itself).

Appellant also argues the Examiner failed to meet the fact-finding requirements outlined in the *Berkheimer Memorandum*. Appeal Br. 10–11. However, consistent with the *Berkheimer Memorandum*, the Examiner cited a case from MPEP § 2106.05(d)—*TLI Communications LLC v. A.V. Automotive, LLC*, as evidence of the well-understood, routine, and conventional nature of the additional limitations.

Because the Examiner correctly concluded claim 1 is directed to a judicial exception, and because Appellant does not identify any error in the Examiner’s determination under step 2B of the Guidance, we sustain the rejection of representative claim 1 under 35 U.S.C. § 101, as well as of the remaining claims.

REJECTIONS UNDER 35 U.S.C. § 103

We reverse the prior art rejection. In rejecting claim 1 as obvious, the Examiner relies on Kendall as generally teaching targeted advertising in a social networking system. Final Act. 13–14. The Examiner acknowledges that Kendall does not teach the specific way of selecting targeted users that is recited in Appellant’s claim 1, and instead relies on Bentolila to cure the deficiency. Final Act. 14–15. Appellant argues Bentolila is deficient in several respects, but we need only address one specific argument to resolve the § 103 issues.

Claim 1 recites, in relevant part,

selecting features for the user model to include selected social graph features, each social graph feature indicating one or more connections to users in the training set of users, the connections stored in a social graph of the social networking system, such that

users that match a social graph feature have connections to the users in the training set of users matching the connections indicated in the social graph feature

OA Response 4. The Examiner cites Bentolila as teaching this limitation. Final Act. 17 (citing Bentolila col. 8, ll. 3–9). Specifically, the Examiner finds Bentolila’s aggregation of user profiles into groups teaches this limitation.

Appellant argues the Examiner has failed to address the “social graph” aspect of the limitation and that Bentolila does not teach any “social graph feature indicating one or more connections to users.” Appeal Br. 16–17; Reply Br. 9–10. We agree.

Although Bentolila describes aggregating user profiles into groups, we discern nothing in Bentolila that can be reasonably understood to suggesting the use of social graphs or any “social graph feature indicating one or more connections to users in the training set of users.” As such, we are persuaded the Examiner erred in finding Bentolila teaches or suggests the recited “social graph” limitations. We, therefore, do not sustain the rejection of claim 1, or of dependent claims 2–7, 9, 17, 18, and 28–31, under 35 U.S.C. § 103.

CONCLUSION

Because we have affirmed at least one ground of rejection for each claim on appeal, we affirm the Examiner’s decision to reject the claims. 37 C.F.R. § 41.50(a)(1).

More specifically:

We affirm the rejection of claims 1–7, 9, 17, 18, and 28–31 under 35 U.S.C. § 112, second paragraph as being indefinite.

We affirm the rejection of claims 1–7, 9, 17, 18, and 28–31 under 35 U.S.C. § 101 as being directed to ineligible subject matter.

We reverse the rejection of claims 1–7, 9, 17, 18, and 28 under 35 U.S.C. § 103 as being unpatentable over Kendall, Bentolila, Bagherjeiran, and Duan.

We reverse the rejection of claims 29–31 under 35 U.S.C. § 103 as being unpatentable over Kendall, Bentolila, Bagherjeiran, Duan, and Elvekrog.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–7, 9, 17, 18, 28–31	112, second paragraph	Indefiniteness	1–7, 9, 17, 18, 28–31	
1–7, 9, 17, 18, 28–31	101	Eligibility	1–7, 9, 17, 18, 28–31	
1–7, 9, 17, 18, 28	103(a)	Kendall, Bentolila, Bagherjeiran, Duan		1–7, 9, 17, 18, 28
29–31	103(a)	Kendall, Bentolila, Bagherjeiran, Duan, Elvekrog		29–31
Overall Outcome			1–7, 9, 17, 18, 28–31	

TIME PERIOD FOR 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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED