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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* HEMANK LAMBA and NATWAR MODANI

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Appeal 2019-001072  
Application 14/172,512  
Technology Center 2100

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Before JAMESON LEE, SALLY C. MEDLEY, and  
JUSTIN T. ARBES, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 1–8 and 10–19. Claims 9 and 20 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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<sup>1</sup> We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as International Business Machines Corporation. Appeal Br. 3.

### CLAIMED SUBJECT MATTER

The independent claims are claims 1, 11, and 12. Claim 1 is directed to a method of discerning collective interest-based social communities. Appeal Br. 43–44 (Claims App’x). Claim 11 is directed to an apparatus for discerning collective interest-based social communities. *Id.* at 47–48 (Claims App’x). Claim 12 is directed to a computer program product for discerning collective interest-based social communities. *Id.* at 49–50 (Claims App’x). Claim 1 is representative and reproduced below:

1. A method of discerning collective interest-based social communities, said method comprising:

accepting input comprising: a population of entities, a collection of objects and/or topics, connectivity information relative to entities among the population of entities, and data indicating an expression of interest in the objects and/or topics by each of the entities;

constructing a social network graph among the entities by representing the entities as nodes in the graph and connectivity between the entities as edges in the graph, wherein the connectivity identifies a connection between two nodes resulting from an underlying social network connection of the entities other than the social network graph;

defining, relative to the social network graph, separate parameters for social connectivity and collective interests, wherein the social connectivity parameter identifies a desired number of connections between the nodes of the social network graph and the collective interest parameter relating to aggregate interests of a group of nodes in the social network graph in the objects and/or topics;

defining a single relative importance parameter which indicates a relative importance, with respect to one another, of the social connectivity parameter and the collective interests parameter;

defining an objective function based on the social connectivity parameter, the collective interests parameter, and the relative importance parameter, wherein the objective function identifies a desired focus between a modularity value and a focusedness value for the social network graph, wherein the modularity value represents the connectedness of the social network graph and wherein the focusedness value represents aggregate interests of the social network graph;

discerning at least one collective interest-based social community with respect to a particular topic or object via optimizing the objective function, wherein the discerning comprises combining at least two nodes in the graph into a single node and wherein the combining comprises evaluating, using a hierarchical agglomerative algorithm, each edge in the graph to determine an increase in the objective function and combining the nodes connected by an edge resulting in the highest increase in the objective function; and

displaying, to a user, a recommendation for targeting the at least one collective interest-based social community with at least one of the objects and/or topics.

#### REFERENCES

- |          |   |               |
|----------|---|---------------|
| Anderson | US Pat. Pub. 2003/0191608 A1  | Oct. 9, 2003  |
| Tantrum  | US Pat. Pub. 2008/0126523 A1  | May 29, 2008  |
| Eggink   | US Pat. Pub. 2009/0248607 A1  | Oct. 1, 2009  |
| Kendall  | US Pat. Pub. 2010/0257023 A1  | Oct. 7, 2010  |
| Lumer    | US Pat. Pub. 2012/0001919 A1  | Jan. 5, 2012  |
| Petersen | US Pat. Pub. 2012/0047565 A1  | Feb. 23, 2012 |
| Chen     | Jiyang Chen, Osmar Zaïane, Randy Goebel, <i>Detecting Communities in Social Networks using Max-Min Modularity</i> , SIAM Journal of Discrete Mathematics, Proceedings of the 2009 SIAM International Conference on Data Mining (April 30 – May 2, 2009), 978–989. |               |

## REJECTIONS

A. Claims 1–4, 6–8, 11–15, and 17–19 were finally rejected under 35 U.S.C. § 103 as obvious over Lumer, Chen, Petersen, Kendall, and Tantrum. Final Act. 3–17.

B. Claims 5 and 16 were finally rejected under 35 U.S.C. § 103 as obvious over Lumer, Chen, Petersen, Kendall, Tantrum, and Eggink.<sup>2</sup> *Id.* at 17–18.

C. Claim 10 was finally rejected under 35 U.S.C. § 103 as obvious over Lumer, Chen, Petersen, Kendall, Tantrum, and Anderson.<sup>3</sup> *Id.* at 19–20.

D. Claims 1–8 and 10–19 were finally rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. *Id.* at 2.

## OPINION

A. The Obviousness Rejection of Claims  
1–4, 6–8, 11–15, and 17–19 over  
Lumer, Chen, Petersen, Kendall, and Tantrum

1. Overview of Lumer

Figure 4 of Lumer is a flowchart of a method according to Lumer and reproduced below:

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<sup>2</sup> The Examiner’s statement of rejection omits Petersen but expressly incorporates the ground on the basis of which claims 2 and 13 have been rejected, which includes Petersen. Final Act. 17. We regard Petersen as a part of the basis for this rejection.

<sup>3</sup> The Examiner’s statement of rejection omits Petersen but expressly incorporates the ground on the basis of which claim 2 has been rejected, which includes Petersen. Final Act. 18. We regard Petersen as a part of the basis for this rejection.

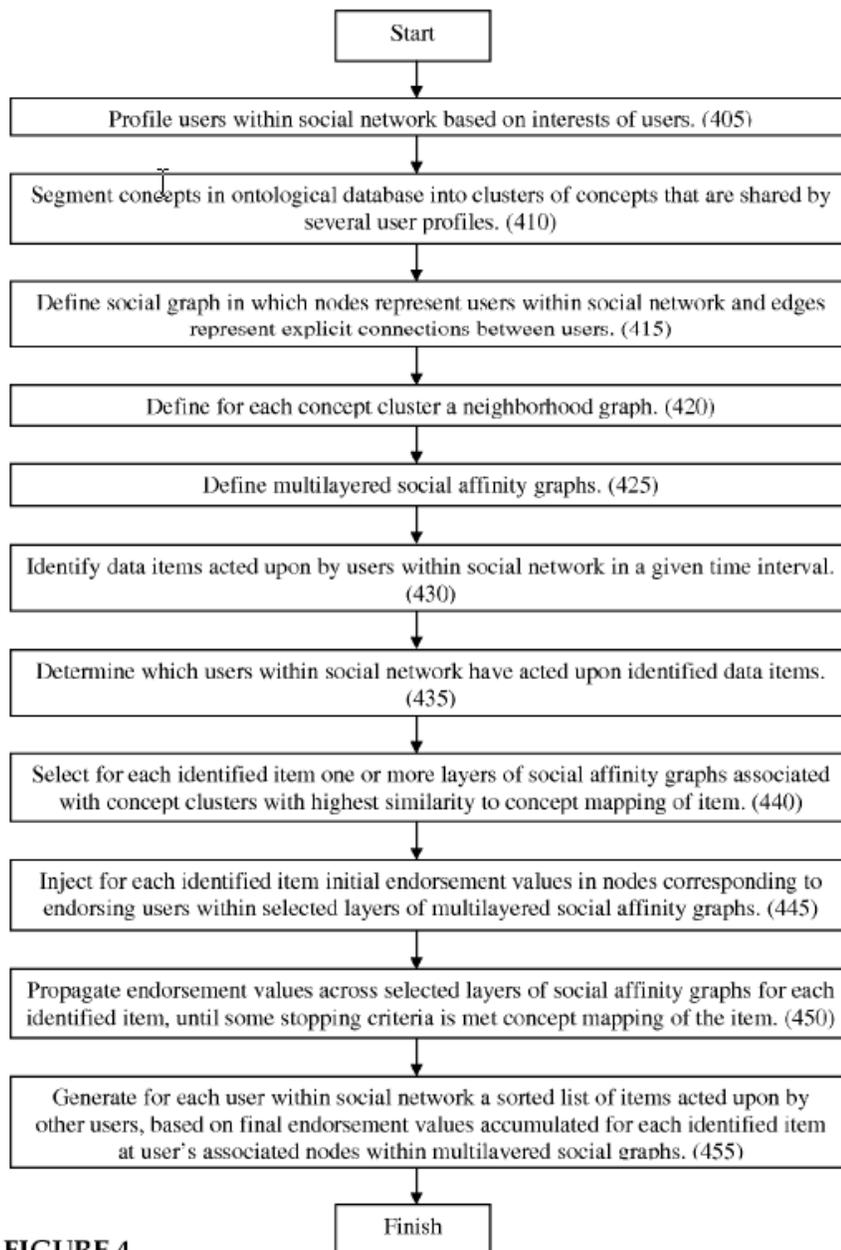


FIGURE 4

Figure 4 illustrates an exemplary method generating personalized sorted lists of data items for users within an online social network.

Lumer ¶ 33.

In step 405, users within the social network are profiled based on their interests. *Id.* ¶ 34. In step 410, concepts are segmented into clusters of concepts that are shared by several user profiles. *Id.* In

step 415, a social graph is defined in which nodes represent the users within the social network and edges represent the explicit connections between the users. *Id.* In step 420, a neighborhood graph for each concept cluster is defined, where the nodes are the users and the edges link each user to a predefined number of other users with the highest similarity in interests with a concept cluster. *Id.* In step 425, multilayered social affinity graphs are defined and each layer corresponds to a different concept cluster. *Id.* Lumer describes that a social affinity graph is weighted in the sense that the weight of a connecting edge between two nodes can be the product of their cluster-specific similarity and the inverse of their degree of separation in the social graph. *Id.* ¶ 25.

In step 425, data items acted upon by users within the social network in a given time interval are identified, and in step 430, users that have acted on the identified items are determined. *Id.* ¶ 34. In step 435, one or more layers of the social affinity graphs are selected for each identified item. *Id.* In step 440, initial endorsement values for the nodes are injected for each identified item. *Id.* In step 445, the endorsement values are propagated across the selected social affinity graphs for each identified item, until some stopping criteria is met. *Id.* Lumer describes that a fraction of the value sticks to the node, with the rest distributed to connected nodes proportionally to the weight of their connections to that node. *Id.* ¶ 26. In step 450, a sorted list of items acted upon by other users is generated for each user within the social network, and each sorted list is based on the final endorsement

values accumulated for each identified item at the user's associated nodes within the multilayered social affinity graphs. *Id.* ¶ 34.

2. Claim 1

Claim 1 recites “defining, relative to the social network graph, separate parameters for social connectivity and collective interests,” and “defining a single relative importance parameter which indicates a relative importance, with respect to one another, of the social connectivity parameter and the collective interests parameter.” Appeal Br. 43 (Claims App’x).

According to the Examiner, Lumer discloses both of these defining steps. Final Act. 5. The evidence cited and relied on by the Examiner, however, does not support the finding that Lumer discloses “defining a single relative importance parameter which indicates a relative importance, with respect to one another, of the social connectivity parameter and the collective interests parameter.”

The Examiner explains as follows, citing to page 3 and paragraph 25 of Lumer for support:

([Page] 3, particularly paragraph 0025; EN: this denotes combining the degree of separation and interests similarity together, with degree of separation being inversed (smaller values better) and interest similarity being normal (higher values better)). “Wherein . . . the collective interest parameter relating to aggregate interests of a group of nodes in the social network graph in the objects and/or topics” ([Page] 3, particularly paragraph 0025; EN: this denotes combining the degree of separation and interest similarity together. The interest similarity denotes aggregate interests of users).

*Id.* (emphases omitted). We agree with Appellant (Appeal Br. 39) that Lumer does not disclose “defining a single relative importance parameter which indicates a relative importance, with respect to one another, of the

social connectivity parameter and the collective interests parameter.” It is misplaced for the Examiner to reason that because in Lumer the social connectivity parameter measures the “degree of separation” between users which is inversely related to an affirmative connection between users, i.e., the bigger the value the less the connection, it is a relatively less important parameter than Lumer’s collective interests parameter. The inverse nature of the connectivity parameter is an intrinsic characteristic of the parameter itself. Nothing indicates that in Lumer the social connectivity parameter is less important than the collective interests parameter.

Indeed, Lumer in its paragraph 25 cited by the Examiner describes that “one implementation may compute the weight of an edge joining two nodes as the product as their cluster-specific similarity and the inverse of their degree of separation in the social graph.” Lumer ¶ 25. That description indicates the social connectivity parameter, reflecting the degree of separation between users, is equally important as the collective interests parameter measuring cluster-specific similarity.

Further, what is claimed is the defining of a separate parameter which indicates a relative importance, with respect to one another, of the social connectivity parameter and the collective interests parameter. It is not satisfied by Lumer even if, hypothetically, we assume that in Lumer the social connectivity parameter is less important than the collective interests parameter, which it is not as discussed above. The Examiner has not identified, much less explained, any such separate “single relative importance parameter” in Lumer.

In the Answer, with regard to the limitation of “defining a single relative importance parameter which indicates a relative importance, with

respect to one another, of the social connectivity parameter and the collective interests parameter,” the Examiner states that there is nothing in the claim that requires a “user” to perform that action. Ans. 9–10. That response is misplaced. Lumer does not disclose “defining a single relative importance parameter which indicates a relative importance, with respect to one another, of the social connectivity parameter and the collective interests parameter,” no matter who or what, or an algorithm, does the act.

For the foregoing reasons, Appellant has shown error in the Examiner’s finding that Lumer discloses “defining a single relative importance parameter which indicates a relative importance, with respect to one another, of the social connectivity parameter and the collective interests parameter.”

Claim 1 also recites a step of “defining an objective function based on the social connectivity parameter, the collective interests parameter, and the relative importance parameter.” Appeal Br. 44 (Claim App’x). According to the Examiner, Chen discloses this limitation. Final Act. 6. But the Examiner has not identified any “relative importance parameter” in Chen. Nor has the Examiner determined that Chen discloses such a “relative importance parameter.” Thus, the record does not support the Examiner’s finding that Chen discloses the step of “defining an objective function based on the social connectivity parameter, the collective interests parameter, and the relative importance parameter.” The finding is erroneous.

Claim 1 further recites a step of “discerning at least one collective interest-based social community with respect to a particular topic or object via optimizing the objective function.” Appeal Br. 44. According to the Examiner, Chen discloses this limitation. Final Act. 6. The Examiner

explains as follows, citing to pages 981–982 and section 4 of Chen: “(Pg. 981–982, particularly section 4; EN: this denotes determining the quality of partitioning *based on connections between nodes within the cluster as well as unrelated nodes found within the clusters*).” *Id.* (emphasis added; original emphasis omitted). The reasoning does not support the finding. Appellant argues that Chen does not meet the disputed phrase. Appeal Br. 40–41. Based on the Examiner’s articulated reasoning, we agree with Appellant.

First, because Chen does not disclose an objective function as discussed above, Chen does not disclose optimizing an objective function. Second, the Examiner’s explanation, quoted above, merely indicates consideration of more nodes and/or more connections between nodes within a cluster. That does not, however, indicate the performance of any optimization as is required by claim 1. Even if a better result is obtained by that approach, it is not the result of having performed optimization.

For the foregoing reasons, we do not sustain the rejection of claim 1 as obvious over Lumer, Chen, Petersen, Kendall, and Tantrum.

### 3. Claims 11 and 12

Claim 11 recites an apparatus for discerning collective interest-based social communities, comprising at least one processor and a computer readable storage medium having computer readable program code embodied therewith and executable by the at least one processor. Appeal Br. 47–49 (Claim App’x). The computer readable program code includes code configured to perform various functions. *Id.* The recited functions match and correspond to each of the steps recited in claim 1.

Claim 12 recites a computer program product for discerning collective interest-based social communities, including a computer readable storage

medium having computer readable program code embodied therewith. Appeal Br. 49 (Claim App'x). The computer readable program code includes code configured to perform various functions. *Id.* The recited functions match and correspond to each of the steps recited in claim 1.

For claims 11 and 12, the Examiner relies on the same analysis provided for claim 1. Final Act. 3–10. Thus, the same deficiencies, discussed above, for claim 1 equally apply to claims 11 and 12. Accordingly, the rejection of claims 11 and 12 as obvious over Lumer, Chen, Petersen, Kendall, and Tantrum cannot be sustained.

5. Claims 2–4, 6–8, 13–15, and 17–19

Claims 2–4 and 6–8 each depend, directly or indirectly, from claim 1, and thus incorporate all of the limitations of claim 1. The deficiencies of the Examiner's analysis for claim 1 equally apply to claims 2–4 and 6–8.

Claims 13–15 and 17–19 each depend, directly or indirectly, from claim 12, and thus incorporate all of the limitations of claim 12. The deficiencies of the Examiner's analysis for claim 12 equally apply to claims 13–15 and 17–19.

Accordingly, the rejection of claims 2–4, 6–8, 13–15, and 17–19 as obvious over Lumer, Chen, Petersen, Kendall, and Tantrum cannot be sustained.

B. The Obviousness Rejection of  
Claims 5 and 16 over Lumer, Chen,  
Petersen, Kendall, Tantrum, and Eggink

Claim 5 depends indirectly from claim 1 and thus incorporates all of the limitations of claim 1. Claim 16 depends indirectly from claim 12 and thus incorporates all of the limitations of claim 12.

The deficiencies of the Examiner's analysis for claim 1 equally apply to claim 5, and the deficiencies of the Examiner's analysis for claim 12 equally apply to claim 16. Eggink, as applied by the Examiner, does not relate to or cure those deficiencies.

Accordingly, the rejection of claims 5 and 16 as obvious over Lumer, Chen, Petersen, Kendall, Tantrum, and Eggink cannot be sustained.

C. The Obviousness Rejection  
of Claim 10 over Lumer, Chen,  
Petersen, Kendall, Tantrum, and Anderson

Claim 10 depends from claim 1 and thus incorporates all of the limitations of claim 1. The deficiencies of the Examiner's analysis for claim 1 equally apply to claim 10. Anderson, as applied by the Examiner, does not relate to or cure those deficiencies. Accordingly, the rejection of claim 10 as obvious over Lumer, Chen, Petersen, Kendall, Tantrum, and Anderson cannot be sustained.

D. The Rejection of Claims 1–8 and 10–19 as Directed  
to Patent-Ineligible Subject Matter under 35 U.S.C. § 101

Appellant states that “[c]laims are argued separately where indicated.” Appeal Br. 23. For the patent-eligible subject matter rejection under 35 U.S.C. § 101, Appellant argues all of these claims together as a group, with no separate argument directed to any claim. *See* Appeal Br. 23–35; Reply Br. 21–33. Thus, we select claim 1 as the representative claim for this group, and the remaining claims 2–8 and 10–19 stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

The 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019), hereinafter “2019 Guidance,” supersedes the earlier guidance that was in effect at the time the Appeal Brief was filed. *Id.* at 51

(“Eligibility–related guidance issued prior to the Ninth Edition, R–08.2017, of the MPEP (published Jan. 2018) should not be relied upon.”).

Accordingly, our analysis will not address the sufficiency of the Examiner’s rejection against the Office’s previous guidance. Rather, our analysis will comport with the 2019 Guidance.

An invention is patent-eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. However, the Supreme Court has held that § 101 includes implicit exceptions—laws of nature, natural phenomena, and abstract ideas—which are not patent-eligible. *See Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014); *Bilski v. Kappos*, 561 U.S. 593, 601 (2010). The 2019 Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019), addresses the manner in which § 101 case law is to be applied by the Office.<sup>4</sup> The Board is required to adhere to the 2019 Guidance as a matter of Office policy. 2019 Guidance 51. The 2019 Guidance sets forth a four-part analysis for determining whether a claim is eligible subject matter under § 101. The four parts are referred to as Step 1, Step 2A Prong 1, Step 2A Prong 2, and Step 2B. *See id.* at 53–56.

1. *2019 Guidance Step 1*

First, under “Step 1,” we consider whether the claimed subject matter falls within the four statutory categories set forth in § 101, namely “[p]rocess, machine, manufacture, or composition of matter.” 2019 Guidance 53–54; *see* 35 U.S.C. § 101. Claim 1 recites a “method” and, thus,

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<sup>4</sup> A further update was issued in October 2019. October 2019 Patent Eligibility Guidance Update, 84 Fed. Reg. 55942 (Oct. 18, 2019).

falls within the “process” category. Consequently, we proceed to the next step of the analysis.

2. *2019 Guidance Step 2A Prong 1*

Second, under “Step 2A Prong 1,” we evaluate “whether the claim recites a judicial exception, i.e., an abstract idea, a law of nature, or a natural phenomenon.” 2019 Guidance 54; *see Alice*, 573 U.S. at 216;<sup>5</sup> *Bilski*, 561 U.S. at 601–602.<sup>6</sup> Citing *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016), the Examiner determined that claim 1’s recited steps constitute an abstract idea, because they merely involve “accepting input,” “constructing a social network graph,” “defining aspects of that graph,” “taking information from the graph,” and “displaying those results to a user.” Final Act. 2. According to the Examiner, those steps amount to no more than “gathering of data,” “analysis of that data,” and “providing select results of the analysis to the user,” which constitute an abstract idea under *Electric Power Group*. *Id. Electric Power Group*, as cited by the Examiner, explains specifically that “collecting information,” “analyzing information by steps people go through in their minds, or by mathematical algorithm,” and “presenting the results of [such] collecting and analyzing information,” “without more,” may constitute an abstract idea. *Electric Power Group*, 830 F.3d at 1353–54.

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<sup>5</sup> In *Alice*, a method of exchanging financial obligations between two parties using a third-party intermediary to mitigate settlement risk was deemed an abstract idea. *Alice*, 573 U.S. at 219.

<sup>6</sup> In *Bilski*, a method of hedging or protecting against risk was deemed an abstract idea. *Bilski*, 561 U.S. at 611.

We agree with the Examiner that claim 1 recites an abstract idea. The 2019 Guidance identifies the following as a sub-group of abstract ideas:

“Mental processes—concepts performed in the human mind (including an observation, evaluation, judgment, opinion).” 2019 Guidance 52 (footnotes omitted). These steps of claim 1 present such a mental process:

accepting input comprising: a population of entities, a collection of objects and/or topics, connectivity information relative to entities among the population of entities, and data indicating an expression of interest in the objects and/or topics by each of the entities;

constructing a social network graph among the entities by representing the entities as nodes in the graph and connectivity between the entities as edges in the graph, wherein the connectivity identifies a connection between two nodes resulting from an underlying social network connection of the entities other than the social network graph;

defining, relative to the social network graph, separate parameters for social connectivity and collective interests, wherein the social connectivity parameter identifies a desired number of connections between the nodes of the social network graph and the collective interest parameter relating to aggregate interests of a group of nodes in the social network graph in the objects and/or topics;

defining a single relative importance parameter which indicates a relative importance, with respect to one another, of the social connectivity parameter and the collective interests parameter;

defining an objective function based on the social connectivity parameter, the collective interests parameter, and the relative importance parameter, wherein the objective function identifies a desired focus between a modularity value and a focusedness value for the social network graph, wherein the modularity value represents the connectedness of the social

network graph and wherein the focusedness value represents aggregate interests of the social network graph;

discerning at least one collective interest-based social community with respect to a particular topic or object via optimizing the objective function, wherein the discerning comprises combining at least two nodes in the graph into a single node and wherein the combining comprises evaluating, using a hierarchical agglomerative algorithm, each edge in the graph to determine an increase in the objective function and combining the nodes connected by an edge resulting in the highest increase in the objective function.

Appeal Br. 43–44 (Claims App’x). These limitations, individually and collectively, describe a mental process, e.g., constructing a type of graph, defining parameters, defining a type of function, and discerning a social community. These limitations are akin to making observations and evaluations that can be performed in the human mind and thus are matters that fall within the “Mental processes” sub-grouping of abstract ideas, both as to each limitation and combinations of such limitations within the claim as a whole. Appellant does not dispute that claim 1 “recites” a mental process in the form of the above-quoted limitations. Appellant’s argument is that the claim is not “directed to” an abstract idea, which we address below.<sup>7</sup>

Further, although Appellant asserts that the Examiner has not identified any particular abstract idea, that argument is manifestly unsupportable in light of the Examiner’s expressly stating that the steps of

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<sup>7</sup> To the extent Appellant also regards the claim as not reciting a mental process, we are unpersuaded. Each of the above-noted steps can be performed in the human mind. With regard to the input accepting step, we note that the mind can accept informational input. Alternatively, as explained below, all the steps other than the input accepting step constitute a mental process.

the claims constitute a mental process as in *Electric Power Group*. Final Act. 2. The 2019 Guidance lists mental processes as a category of abstract ideas. 2019 Guidance 52.

3. *2019 Guidance Step 2A Prong 2*

Having determined that claim 1 recites an abstract idea, we proceed to “Step 2A Prong 2” of the 2019 Guidance, which requires that we evaluate whether “the claim as a whole integrates the recited judicial exception into a practical application of the exception.” 2019 Guidance 54. If the abstract idea is so integrated, then the claim is not “directed to” a judicial exception and is eligible subject matter, and the subject matter eligibility inquiry concludes. *Id.* Otherwise, the inquiry requires further analysis under Step 2B. *Id.*

“A claim that integrates a judicial exception into a practical application will apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the judicial exception.” *Id.*; see *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 78 (2012). The 2019 Guidance specifies that this evaluation is conducted by first “[i]dentifying whether there are any additional elements recited in the claim beyond the judicial exception(s),” then “evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application.” 2019 Guidance 54–55.

The 2019 Guidance lists non-exhaustive exemplary considerations tending to indicate that a judicial exception such as an abstract idea has been integrated into a practical application:

An additional element reflects an improvement in the functioning of a computer, or an improvement to other technology or technical field;

an additional element that applies or uses a judicial exception to effect a particular treatment or prophylaxis for a disease or medical condition;

an additional element implements a judicial exception with, or uses a judicial exception in conjunction with, a particular machine or manufacture that is integral to the claim;

an additional element effects a transformation or reduction of a particular article to a different state or thing; and

an additional element applies or uses 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.

*Id.* at 55 (footnotes omitted). The Examiner identified no such element in the claim. We agree that none applies.

Appellant asserts that the Examiner's determination that the claims are directed to an abstract idea is unsupported by the evidence of record and is nothing but a conclusory statement. Appeal Br. 23. Appellant further asserts that the Examiner "fail[ed] to specifically point out the factors that are relied upon in making the determinations that the claims are directed to an abstract idea." *Id.* at 24. According to Appellant, the Examiner's identification that the claims are directed to accepting input, constructing a social network graph, defining aspects of that graph, taking information from the graph, and displaying those results to a user, is an overgeneralization. *Id.* We disagree with each of these contentions of Appellant. None of the exemplary considerations fits the facts of this case. All of the above-noted elements of claim 1 reflect merely a mental process,

and nothing else is left in the claim for which any of the exemplary considerations applies. The last step of claim 1 is displaying a recommendation to the user, which is not then used to control or effect the operation of anything. There is no overgeneralization by the Examiner, and we do not fault the Examiner for not having identified and discussed, specifically, anything more.

Appellant argues that the claimed invention is not “directed to” an abstract idea. Appeal Br. 25–27. Appellant asserts that the claimed invention is “directed to an improvement to the technical field of identification of collective interest groups” through the various elements recited in the claims. *Id.* at 26–27. Appellant further asserts that the claims are directed to “an improvement in existing computer technology” because “the claimed limitations provide benefits over conventional techniques for identification of collective interest groups.” *Id.* at 29. Specifically, citing to the Specification, Appellant asserts that “the present application provides a faster and less costly technique for identifying social communities that also allows a user to provide input into which parameters are more important in identifying the social communities, that are not provided by traditional techniques.” *Id.* According to Appellant, “[t]raditional techniques rely on either manual processes or expensive graph algorithms that must be run on each subgraph,” and thus “are slow and inefficient.” *Id.* at 28. Appellant also asserts that the claimed invention “provide[s] a [technical] improvement over existing techniques for identification of collective interest groups.” *Id.* at 29. These arguments are incommensurate in scope with the subject matter of claim 1, and thus unpersuasive, for reasons discussed below.

Appellant does not adequately explain why “identification of collective interest groups” constitutes a “technical field.” We are not persuaded that it is, given that it can be performed mentally in the mind. Appellant does not identify any claim element that reflects an improvement in the functioning of a computer, or an improvement to other technology or technical field. Although the claimed process may be implemented by a computer, a computer is neither required nor necessary.

Even if the claimed steps are implemented by a computer,<sup>8</sup> nothing about the internal structure or operations of such a computer is changed, much less improved. It would still store data the same way, execute commands the same way, and provide input and output the same way. The record does not support that the invention as claimed constitutes improved technology, improvement in a technical field, or a technical improvement. Rather, it is a new approach to thinking of and evaluating information, to discern collective interest-based social communities and identify a particular one of such collective interest-based social communities. The improvement, if any, lies in the mental process itself, i.e., how to evaluate and process the recited input (“a population of entities, a collection of objects and/or topics,

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<sup>8</sup> Although claim 11 recites a processor and a computer readable storage medium having computer readable program code executable by the processor, which perform the steps recited in claim 1, and claim 12 recites a computer program product having computer readable program code therein which performs the steps of claim 1, Appellant has not argued those claims separately. Indeed, the processor, the computer readable storage medium, and the computer program product all would not have been an additional element that applies the mental process in a meaningful way beyond generally linking it to a particular technological environment. *See* 2019 Guidance 55.

connectivity information relative to entities among the population of entities, and data indicating an expression of interest in the objects and/or topics by each of the entities”), which is non-technical. It is not an improvement in a technical field simply because the claimed method of evaluating information is more efficient than pre-existing ways of evaluating information.

Appellant asserts that the invention provides “a technique that allows a user to control an importance of the social connectivity parameter and the collective interests parameter, which is not possible using conventional techniques.” Appeal Br. 30. Even if so, the improvement would lie in the form of a mental process of how to observe and evaluate the recited input, and, as such, does not provide a solution to any technical problem or a technical improvement.<sup>9</sup>

For the foregoing reasons, we determine that no additional element or combination of elements in claim 1 integrates the abstract idea into a practical application.<sup>10</sup>

4. *2019 Guidance Step 2B*

We now review claim 1, which recites an abstract idea that has not been integrated into a practical application, to determine whether additional

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<sup>9</sup> We agree with the Examiner (Ans. 4) that “[t]he cited limitations denote no technical field at all, but a method of gathering and analyzing data.” We also agree with the Examiner (Ans. 5) that even if the abstract idea is improved, that does not make the improved idea statutory subject matter.

<sup>10</sup> Referring to claim 1, Appellant states that “the claimed limitations provide a method for generating a schedule recommendation for resources within the bank that ensures that the wait time of customers will be minimized.”

Appeal Br. 27. This appears to be a typographical error, as claim 1 includes no limitation relating to “a schedule,” “bank,” or “wait time of customers [of a bank].”

claim elements beyond the abstract idea, alone or in combination, provide an “inventive concept,” i.e., whether they amount to “significantly more” than the abstract idea itself to make the claimed invention patent-eligible. 2019 Guidance 56; *see Alice*, 573 U.S. at 217–18. According to the 2019 Guidance, “[adding] a specific limitation or combination of limitations that are not well-understood, routine, conventional activity in the field” may indicate an inventive concept is present. *Id.* Conversely, “simply append[ing] well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality,” typically indicates an inventive concept is absent. *Id.*

As discussed above, virtually the entirety of claim 1 sets forth a mental process and there are no elements in claim 1 additional to the mental process identified by the Examiner other than the final displaying step, which is simply displaying information to a user. Thus, there are no additional claim elements beyond the abstract idea, alone or in combination, which provide an “inventive concept,” i.e., amounting to “significantly more” than the abstract idea itself to make the claimed invention patent-eligible.

Alternatively, even assuming that both accepting of input and displaying of a recommendation are not a part of the mental process or abstract idea, we still reach the same conclusion. In that regard, Appellant specifically acknowledges that acceptance of input “may be a known technique.” Appeal Br. 33–34. Appellant argues, instead, that the type of input recited by the claim is not known. *Id.* at 34. We are unpersuaded by that argument, because the type of input is not significantly more than the mental process when the mental process, as here, requires that type of input.

It constitutes ancillary data gathering which does not add practical significance to the underlying mental process. *See CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1370 (Fed. Cir. 2011). Likewise, displaying the results of data evaluation, such as the claimed displaying of a recommendation to the user, constitutes insignificant post-solution activity which does not transform patent-ineligible subject matter to patent-eligible subject matter. *See Diamond v. Diehr*, 450 U.S. 175, 191–92 (1981).

Appellant further asserts that the elements as claimed are not known elements, or if they are known elements, then they are combined in a manner that is unconventional. Appeal Br. 33. The argument is misplaced, because in making that argument Appellant is referring to the parts of the claim that constitute or are within the abstract idea, i.e., the mental process. The proper analysis for determining whether an “inventive concept” is present is to determine whether additional claim elements beyond the abstract idea, alone or in combination, provide an “inventive concept,” i.e., whether they amount to “significantly more” than the abstract idea itself to make the claimed invention patent-eligible. 2019 Guidance 56; *see also Alice*, 573 U.S. at 221. Appellant has identified no such “additional” elements in the claim. For this part of the patent-eligibility analysis, it matters not that the recited mental process is not unknown or unconventional. The Examiner is correct in stating that claim 1 “cites no hardware or other material which could be considered for significantly more.” Ans. 7.<sup>11</sup>

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<sup>11</sup> Although claim 11 recites a processor and a computer readable storage medium having computer readable program code executable by the processor, which perform the steps recited in claim 1, and claim 12 recites a computer program product having computer readable program code therein

For the foregoing reasons, we find that claim 1 does not contain an “inventive concept” sufficient to transform the claimed abstract idea into patent-eligible subject matter. As noted above, claims 2–8 and 10–19 stand or fall with claim 1 on this rejection based on 35 U.S.C. § 101.

### CONCLUSION

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>References/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1–4, 6–8, 11–15, 17–19	103	Lumer, Chen, Petersen, Kendall, Tantrum		1–4, 6–8, 11–15, 17–19
5, 16	103	Lumer, Chen, Petersen, Kendall, Tantrum, Eggink		5, 16
10	103	Lumer, Chen, Petersen, Kendall, Tantrum, Anderson		10
1–8, 10–19	101	Eligibility	1–8, 10–19	

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

### AFFIRMED

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which performs the steps of claim 1, Appellant has not argued those claims separately. Indeed, Appellant does not argue that the processor, computer readable storage medium, or computer program product having computer readable program code, are not routine, well-known, or conventional.