

Σummations:

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THE ARTIFICIAL INTELLIGENCE ISSUE

Artificial intelligence has become one of the fastest growing categories of computer-implemented inventions which are described and claimed in U.S. patent applications, and which are being enforced in the U.S. federal courts and at the U.S. International Trade Commission. Artificial intelligence is being integrated into devices and systems that affect every aspect of our daily lives. The development of self-driving cars, facial recognition, and intelligent voice assistants immediately come to mind. Artificial intelligence inventions allow us to accomplish tasks faster and more accurately, using less computer processing resources and less data, making them in many cases more reliable and economical when compared to conventional computer applications or systems. The pace of innovation in this field of technology is staggering and will continue to accelerate.

Therefore, we are devoting the entire Spring 2020 issue of our newsletter to discussing developments in U.S. patent law as they apply to artificial intelligence-based inventions, in particular whether and under what circumstances those inventions are considered eligible for patent protection. That is obviously a very important issue, given the tremendous financial and human investments that have been devoted to developing and perfecting this technology. We present detailed discussions of three recent patent cases that involve artificial intelligence or mathematically formulas (which artificial intelligence systems often rely on). Those case discussions focus on the legal criteria that is applied to determining whether those inventions may be patented and how it has been applied to several factual scenarios. Through an understanding of the reasoning of the patent examiner and the USPTO's Patent Trial and Appeal Board in each case, we hope that this discussion will provide useful insights into how a patent specification for this technology should be written, what aspects of the technology should be emphasized, and

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how it should be claimed, in order to maximize the likelihood that the invention will be granted a patent.

USPTO’S PATENT TRIAL AND APPEAL BOARD FINDS PATENT CLAIMS DIRECTED TO ARTIFICIAL INTELLIGENCE INVENTIONS WHICH PREDICT MAINTENANCE REQUIREMENTS AND EQUIPMENT FAILURES ARE PATENT ELIGIBLE

The Patent Trial and Appeal Board of the U.S. Patent and Trademark Office (“USPTO”) recently decided the case of *Ex Parte Adjaoute*, Appeal No. 2018-007443 (PTAB Decision on Appeal October 10, 2019), in which it reversed a final determination by a Patent Examiner that the invention claimed in Mr. Adjaoute’s U.S. patent application was not patentable because it was directed to patent ineligible subject matter under 35 U.S.C. 101. Mr. Adjaoute’s claimed invention was directed to a method and apparatus for monitoring the operation of machines in order to predict their need for maintenance and equipment failure interventions. It employed several different artificial intelligence classification technologies to form a panel or “jury,” and then used combinational digital logic to render “verdicts” about the need to service the machines and prevent impending failures of the machine equipment that were being monitored. Claim 1 of Mr. Adjaoute’s application recited the following elements:

A method for monitoring the operation of machines and for issuing calls for preventative maintenance and predictions of equipment failures, comprising:

attaching monitoring devices, instruments, and transducers to a machine subject to operational failures;

reading in measurements and data obtained by the monitoring devices, instruments, and transducers regarding the status and operation of the machine;

empaneling a jury of classification models as jurors to assess the measurements and data obtained with a separate computer programmed for that purpose;

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presenting all the measurements and data obtained to the jury with a separate computer programmed for that purpose;

classifying the measurements and data obtained and presented to the jury according to a logic decision tree and outputting a juror vote that includes a confidence assessment with a separate computer programmed for that purpose;

classifying the measurements and data obtained and presented to the jury according to a neural network and outputting another juror vote that includes a confidence assessment with a separate computer programmed for that purpose;

classifying the measurements and data obtained and presented to the jury according to a fuzzy logic and outputting another juror vote that includes a confidence assessment with a separate computer programmed for that purpose;

classifying the measurements and data obtained and presented to the jury according to a smart agent profiling and outputting another juror vote that includes a confidence assessment with a separate computer programmed for that purpose;

classifying the measurements and data obtained and presented to the jury according to business rules and outputting another juror vote that includes a confidence assessment with a separate computer programmed for that purpose;

classifying the measurements and data obtained and presented to the jury according to case-based reasoning and outputting another juror vote that includes a confidence assessment with a separate computer programmed for that purpose;

collecting all the juror votes into a single ballot and mathematically apply individual weights in calculations to each respective juror vote with respect to its own confidence assessment and a priori data inputs with a separate computer programmed for that purpose;

tallying a verdict from the results obtained in the previous steps, and that predicts an operational failure of the machine by outputting a report with a separate computer programmed for that purpose; and

tallying another verdict from the results obtained in the previous steps, and that summons a particular service procedure and/or a replacement part for the machine by outputting another report so the costs of maintaining the machine are reduced.

In its review of the Examiner's determination of patent ineligibility, the Board applied the two-step test that is set forth by the U.S. Supreme Court in its *Alice Corp. v. CLS Bank* and *Mayo v. Prometheus Labs* decisions. Under that two-part test, a determination is first made regarding whether the claimed invention is directed to an abstract idea, and if it is, then a further determination is made as to whether it is directed to an "inventive concept" sufficient to "transform" the abstract idea into a patent eligible application. The patent claim that is found to be directed to an abstract idea must include "additional features" to ensure that the claim is more than "a drafting effort designed to monopolize the abstract idea." In general, merely using a generic computer implementation will be insufficient to transform an abstract idea into a

patent-eligible invention.

The Board noted that under these and other Supreme Court decisions, a patent claim is ineligible if it is directed to laws of nature, natural phenomena and abstract ideas. Abstract ideas which have been determined to be patent ineligible include methods of organizing human activity, such as fundamental economic practices, mathematical formulas and mental process. However, the Board noted that in its *Diamond v. Diehr* decision the Supreme Court determined that a patent claim that is drawn to subject matter that is otherwise patent eligible is not made ineligible simply because it uses a mathematical formula. The Supreme Court in *Diehr* also indicated that a patent claim seeking protection for that mathematical formula in the abstract cannot be made eligible for patent protection by attempting to limit its use to a particular technological environment.

The Board also followed the framework for patent eligibility set forth in the USPTO's January 7, 2019 Revised Patent Subject Matter Eligibility Guidance ("Guidance"). The Guidance provides a multi-step process for determining whether a claim is patent eligible. Under Step 1 of the Guidance, a determination is made regarding whether the claimed subject matter falls within one of the four categories of patentable subject matter set forth in Section 101, *i.e.*, a process, machine, manufacture, or composition of matter. Step 2 of the Guidance is a multi-step test under which the claim is reviewed to determine whether A) it recites subject matter that falls within one of the categories that judicial decisions have determined to be ineligible (*i.e.* a "judicial exception"), *i.e.*, mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes; and B) whether the claim recites additional elements that integrate the "judicial exception" subject matter into a practical application.

Further, the Guidance provides that if a patent claim recites subject matter that falls within a "judicial exception," and does not integrate that exception into a practical application, then the claim must be further analyzed to determine whether it adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field, which would make it patent eligible. If the claim simply adds to the judicially excluded subject matter only well-understood, routine, conventional activities previously known to the industry that are specified at a high level of generality, then the claim would be considered ineligible for patenting.

Applying this multi-step framework to Mr. Adjaoute's patent claims, the Board found under Step 1 of the Guidance that independent Claim 1 recited a method for monitoring, and independent Claim 8 recited a group of electronic appliances for monitoring. Therefore, each independent claim was directed to a class of invention recognized as patent eligible under Section 101, *i.e.*, a method and a machine, respectively.

Under the first part of Step 2, the Board considered whether Mr. Adjaoute's claimed invention was directed to an abstract idea by applying the USPTO's conceptual framework in the Guidance for defining what an "abstract idea" is:

- (a) Mathematical concepts – mathematical relationships, mathematical formulas or equations, mathematical calculations;
- (b) Certain methods of organizing human activity – fundamental economic principles or practices (including hedging, insurance, mitigating risk); commercial or legal interactions (including

agreements in the form of contracts; legal obligations; advertising, marketing or sales activities or behaviors; business relations); managing personal behavior or relationships or interactions between people (including social activities, teaching, and following rules or instructions); and

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

In applying this conceptual framework, the Examiner concluded that Mr. Adjaoute's claims were directed to "the abstract idea of monitoring the operation of machines:" and that "monitoring the operation of machines is a fundamental economic practice." As a result, the Examiner concluded that Claim 1 is directed to an abstract idea because it recites "a method for reading data; assessing data; presenting data; classifying data; collecting data; and tallying data."

The Board disagreed and found that the claims did not recite "certain methods of organizing human activity," and that "monitoring the operation of machines" was a not a fundamental economic principle (such as hedging, insurance or mitigating risk). Further, the Board did not find that the claims recited commercial or legal interactions, or managing personal behavior or relationships or interactions between people. Therefore, the Board was not persuaded that the claims fell within those judicially excluded categories."

The Board also found that the claims did not recite a mental process, such as activities people can perform using their minds, or pen and paper. The Board found instead that the operations recited in Claims 1 and 8 are not practically performed in the human mind. The Board noted that the claims recite (and the specification describes) monitoring the operation of machines using neural networks, logic decision trees, confidence assessments, fuzzy logic, business rules, smart agent profiling, and case-based reasoning, and then outputting a juror vote that includes a confidence assessment for each classification. Claim 8, in particular, recites "a smart-agent juror module," "a data-mining juror module," "a fuzzy logic juror module," "a business-rules juror module," "a case-based reasoning juror module," "an associative-learning juror module," "a clustering juror module," and "a meta-rule arbiter module." Claim 1 also recited tallying two different verdicts from the classification results, and Claim 8 recites transforming the composite prediction "into human readable form." Based on the detailed descriptions of these claim elements in the specification, the Board concluded that the claims recited a system that would be difficult and challenging for non-experts to undertake due to their computational complexity, making it impractical to perform these steps mentally.

Further, the Board noted that since the specific mathematical algorithm or formula that undertakes the "classifying" steps of Claim 1 and the "modules" function recited in Claim 8 was not recited in the claims, those claims were not considered to recite a mathematical concept under the Guidance. As a result, the Board concluded that Mr. Adjaoute's claims did not recite an abstract idea.

The Board went on to state that even if it had found that Mr. Adjaoute's claims recited an abstract idea, it would have found that the idea was integrated into a practical application that would meet the requirements for patentability set forth in the Guidance. Independent Claims 1 and 8 did not merely recite the

performance of a business practice known from the pre-Internet world along with the requirement that it be performed on a computer. Instead, the Board found that the claimed solution was necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks. In particular, the Board noted that Mr. Adjaoute's claimed invention addresses the need for preventative maintenance and the prediction of equipment failure in machines by using several artificial intelligence classification technologies to monitor the operation of those machines. The claims also recited producing a single composite prediction output, as a result of the multiple classification operations, that predicts an operational failure of the machine and summons a particular service procedure or replacement part for the machine in order to reduce costs. This was found to be a sufficient concrete application of the various AI calculations that would render the claims patentable. As a result, the Board reversed the Examiner's final rejection of the claims in this case.

The Board's decision in *Ex Parte Adjaoute* suggests that the complexity of an invention will be given substantial consideration regarding whether it constitutes a series of mental steps that can be performed manually. The fact that the invention includes operations involving artificial intelligence may present unique challenges to the applicant in terms of convincing the Examiner or the Board that the operations cannot reasonably be performed by the human mind manually, as the use of artificial intelligence suggests an attempt to duplicate the functioning of the human brain on a computer. Therefore, elements of the artificial intelligence-based operations that may be done faster and more accurately than the human mind can process them, or which have the capacity to conduct multiple calculations simultaneously in parallel, may be considered when determining whether the claims merely recite a series of mental processes or are an attempt to order human behavior.

In addition, it was apparently significant to the Board in *Adjaoute* that the Applicant did not claim the specific algorithms or mathematical formulas used to undertake the classification functions, which allowed the claims to avoid falling into another judicial category of unpatentability. Therefore, unless they are very important to the nature of the technological improvement accomplished by the invention, specific algorithms or mathematical equations/formulas should not be included in the claims. However, if they must be, that may not be fatal to the patentability of the invention, as the next case discussion demonstrates.

USPTO'S PATENT TRIAL AND APPEAL BOARD FINDS PATENT CLAIMS INCORPORATING MATHEMATICAL FORMULAS ARE PATENT ELIGIBLE

The Patent Trial and Appeal Board of the U.S. Patent and Trademark Office ("USPTO") recently decided the case of *Ex Parte Baba*, Appeal No. 2019-000116 (PTAB Decision on Appeal December 30, 2019), in which it reversed a final determination of a Patent Examiner that the invention claimed in Mr. Baba's U.S. patent application was not patentable because it was directed to patent ineligible subject matter under 35 U.S.C. 101. Mr. Baba's claimed invention was generally directed to estimating a battery's state of charge using charge, discharge and terminal voltage detection units, and three processing units for estimating and comparing open circuit voltage method and current integration method states of charge to arrive at a state of charge estimate and an error correction value that was used to increase the accuracy of the charge state

calculation. Claim 1 of Mr. Baba's application recited the following elements:

A battery's state of charge estimation apparatus:

a charge and discharge current detection unit for detecting a charge current and a discharge current of a battery;

a terminal voltage detection unit for detecting a terminal voltage of the battery;

a first processing unit for providing an open circuit voltage method state of charge estimate, the first processing unit configured to estimate an open circuit voltage of the battery based on the charge current and the discharge current detected by the charge and discharge current detection unit and the terminal voltage detected by the terminal voltage detection unit, and configured to estimate, based on the open circuit voltage, the open circuit voltage method state of charge from an open circuit voltage-state of charge characteristic of the battery;

a second processing unit for providing a current integration method state of charge, the second processing unit configured to use as a current integration model, a discrete state space model of a spreading system that uses a state variable of the spreading system in consideration of a current fluctuation Δi expressed by the following equation:

$$Z = \begin{bmatrix} x \\ u \end{bmatrix}$$

provided that an input u represents the charge and discharge current of the battery, a state variable x represents the battery's state of charge, and an output y represents the state of charge and the charge and discharge current, and is expressed by the following equations:

$$Z_{k+1} = \begin{bmatrix} 1 & \frac{\Delta t}{FCC} \\ 0 & 1 \end{bmatrix} z_k + \begin{bmatrix} v_k \\ [\zeta_k] \Delta i \end{bmatrix}$$

$$y_k = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} z_k + w_k$$

(k : discrete time, Δt : sampling period, FCC : full charge capacity, v : process noise, w : sensor noise), for inputting the charge current and the discharge current detected by the charge and discharge current detection unit and thus obtaining the state of charge as the state variable, and for correcting the state of charge based on an error correction value being further input and thus obtaining the current integration method state of charge; and

a third processing unit configured to compare the current integration method state of charge

obtained by the second processing unit and the open circuit voltage method state of charge estimated by the first processing unit to calculate an error correction value for correcting the current integration method state of charge, and for inputting the error correction value to the second processing unit.

The Examiner at the USPTO rejected claims 1 and 2 of Mr. Baba's application under Section 101 because they were allegedly directed to an abstract idea without significantly more. The Examiner determined that the concepts of estimating an open circuit voltage, the use of the recited equations as a current integration model, and comparing open voltage method and current integration method states of charge, are abstract. On appeal to the Board, Mr. Baba argued that the claims were directed to an improvement of the related technology, namely, battery charge estimation.

In its review of the Examiner's determination of patent ineligibility, the Board applied the same two-step tests that it did in its decision of *Ex Parte Adjaoute* that is discussed in detail in the preceding article. Those tests are set forth by the U.S. Supreme Court in its *Alice Corp. v. CLS Bank* and *Mayo v. Prometheus* decisions. Under that two-part test, a determination is first made regarding whether the claimed invention is directed to an abstract idea, and if it is, then a further determination is made as to whether it is directed to an "inventive concept" sufficient to "transform" the abstract idea into a patent eligible application. The patent claim must include "additional features" to ensure that the claim is more than "a drafting effort designed to monopolize the abstract idea." In general, merely using a generic computer implementation will be insufficient to transform an abstract idea into a patent-eligible invention.

The Board noted that under these and other Supreme Court decisions that a patent claim is ineligible if it is directed to laws of nature, natural phenomena and abstract ideas. Abstract ideas which have been determined to be patent ineligible include methods of organizing human activity, such as fundamental economic practices, mathematical formulas and mental process. However, the Board noted that in its *Diamond v. Diehr* decision the Supreme Court determined that a patent claim that is drawn to subject matter that is otherwise patent eligible is not made ineligible simply because it uses a mathematical formula. The Supreme Court in *Diehr* also indicated that a patent claim seeking protection for that mathematical formula in the abstract cannot be made eligible for patent protection by attempting to limit its use to a particular technological environment.

The Board also followed the framework for patent eligibility set forth in the USPTO's January 7, 2019 Revised Patent Subject Matter Eligibility Guidance ("Guidance"), whose requirements are summarized in the preceding article discussing the Board's decision in *Ex Parte Adjaoute*. Applying this multi-step framework to Mr. Baba's patent claims, the Board found that under Step 1 of the Guidance it was not disputed that claims 1 and 2 recited an "apparatus," which is an eligible category of invention under Section 101. Under the first part of Step 2, the Board found that since Mr. Baba's claims recited at least one mathematical formula, they recite a "mathematical concept," which prior judicial decisions have determined was an abstract idea.

Applying the second part of Step 2 of the Guidance, the Board noted that whether a patent claim is "directed to" patent eligible subject matter is not simply whether the claims *involve* a patent-ineligible concept, because every routinely patent-eligible claim involving physical products and actions *involves* a law of

nature and/or natural phenomena. Rather, the claims must be considered in their entirety, in light of the specification, to determine whether the claims’ “character as a whole is directed to excluded subject matter.”

Applying this reasoning to Mr. Baba’s patent claims, the Board found that the Examiner was incorrect that the claims are directed to an abstract idea, because that would disregard the claim language that requires “a charge and discharge current detection unit” and first, second and third processing units that were collectively configured to perform a process to determine a battery’s state of charge based on the measured charge and discharge current values. Therefore, the Board determined that the patent claims were directed to an improved battery charge estimation apparatus. The specification of Mr. Baba’s application was found by the Board to support this conclusion, because it described how the claimed invention avoided the problems and inaccuracies inherent in the charge and discharge detection units that were used, as well as the fluctuation of the current within the battery, in order to produce a charge state estimate that had a high degree of accuracy.

The Board found it significant that Mr. Baba’s claimed invention went beyond merely collecting and mathematically manipulating data, but that it instead used that data to direct subsequent operations of the system, namely the estimation of a battery’s state of charge. The fact that Mr. Baba’s claims recited a specific and concrete use for the results of the mathematical calculations weighed in favor of their patent eligibility.

The Board’s decision in *Ex Parte Baba* is instructive to applicants who describe and claim methods and apparatus which rely on mathematical equations to perform some or all of the recited operations. In order to support patent eligibility, the specification should clearly describe in as much detail as possible how and why the claimed invention is an improvement over the state of the art that existed at the time that the invention was made. The components or operations of the invention which constitute the technological improvement must also be claimed. The claims should also, where possible, recite special purpose components which are adapted to perform the specialized operations recited in the claim to achieve the recited outcome, in this case the determination of a highly accurate battery charge state value. Finally, the claims must recite a specific, concrete application for the use of the data resulting from the mathematical calculations. Therefore, inventions of this type may be found eligible for patent protection, even though they arguably fall within one of the judicially excluded categories, if these actions are taken when the U.S. patent application is first prepared and filed.

USPTO’S PATENT TRIAL AND APPEAL BOARD FINDS PATENT CLAIMS USING MACHINE LEARNING AND STATISTICAL MODELS FOR DYNAMICALLY GENERATING A CUSTOMIZED ONLINE SURVEY ARE PATENT ELIGIBLE

The Patent Trial and Appeal Board of the U.S. Patent and Trademark Office (“USPTO”) also decided the case of *Ex Parte Kannan*, Appeal No. 2018-004925 (PTAB Decision on Appeal June 11, 2019), in which it reversed a final determination of a Patent Examiner that the invention claimed in Mr. Kannan’s U.S. patent application was not patentable because it was directed to patent ineligible subject matter under 35 U.S.C. 101. Mr. Kannan’s invention was directed to a customer relationship management (CRM) system that used

machine learning and statistical models for dynamically generating a customized on-line survey consistent with the customer's preferences. Mr. Kannan's claimed invention took into consideration a customer's preferences in terms of interests, look and feel and purchase habits, and generated a computed value that would predict the customer's likelihood of responding to the survey. Claim 6 of Mr. Kannan's application recited the following elements:

A computer implemented method for automatically generating a customized survey design, comprising:

obtaining any of machine learning and statistical models that predict a customer intent as a function of customer data,

wherein said machine learning and statistical models are trained to identify associations between customer data and a pre-defined list of possible customer intents including any of browsing for specific product information, browsing for deals on a specific product, simple browsing without intent of purchase, intent of purchasing a specific product in immediate future, intent of purchasing a product for a specific need in immediate future, trying to gather information to solve a specific service related problem or a problem associated with a specific product;

obtaining customer data having a record of a plurality of web page activities associated with a customer device,

wherein the plurality of web page activities include any of a time of a web page visit associated with the customer device, a referral web page, landing and/or exit web pages, detected interaction with a web page, and interaction history with a web page;

in connection with receiving and fulfilling a request for Web-based information, from a customer device, a processor applying any of the machine learning and the statistical models to predict a customer intent based on the customer data said processor identifying an ordered sequence of inputs in the customer data associated with a web browsing history through a plurality of web pages by the customer device and interaction history with the plurality of web pages;

applying, by said processor, the predicted customer intent and the ordered sequence of inputs to proactively determine whether a customized survey is to be delivered to said customer device by: additional web browsing history and interaction history is detected, at each instance said processor calculating the predicted customer intent and a probability of receiving a survey response;

when the probability of receiving the survey response crosses a predetermined threshold, said processor generating a customized survey design based on the predicted customer intent, the customized survey design including at least one question among a plurality of questions, at least one option to answer the at least one question, and an appearance selected from a design library corresponding to the predicted customer intent,

wherein generating the customized survey design comprises a survey selection module, based upon model provided information, mapping the predicted customer intent to at least one available question among a plurality of available questions and/or applying a weighting function to select at least one available question among the plurality of available questions, the at least one available

question being incorporated in the customized survey design; and said processor delivering a survey including the customized survey design to the customer device.

The Examiner finally rejected Claims 6-13 because they were allegedly directed to patent ineligible material. Applying the two-step test set forth in *Alice Corp v. CLS Bank* that is discussed in detail in the two articles above, the Examiner determined that independent claims 6 and 10 are directed to the abstract idea of “managing customized survey generation and delivery.” The Examiner found that the various steps in the claimed method, such as obtaining statistical models to predict customer intent, obtaining the required customer data, determining a prediction of customer intent, applying that customer intent to decide whether to deliver a customized survey to the customer and then generate the customized survey, were all steps which can be performed by a human mentality or with pen and paper, which is a “judicial exception” to patent eligibility.

To the Examiner, the steps recited in the claims were simply directed to collecting information, analyzing it, and displaying certain results of the collection and analysis. The Examiner argued that this involved nothing more than executing algorithms on generic, general purpose computers to find a resulting value based on input parameters, and required nothing more than the manipulation or reorganization of data, and did not provide significantly more than an abstract idea. In the Examiner’s opinion, the claimed invention at most provided an improvement to a business model (and not a technology) by increasing customer response rates to the survey. The Examiner also found that the claimed function of managing customized survey generation is merely a method of organizing human activity and a fundamental economic practice, which Courts have found unpatentable because it is like “generating menus on a computer.”

Applying the second *Alice* step, the Examiner determined that Mr. Kannan’s patent claims did not recite additional elements that were significantly more than the abstract idea of managing customized survey generation and delivery. Instead, the Examiner found that the claims merely implement this abstract idea on generic devices which are performing their well-understood, routine and conventional functions, and that the various algorithms described in the specification can be performed manually or on a generic computer. The other operations recited in the computer, such as targeting content to customers based on customer data/attributes, transmitting/exchanging data between well-known devices, locating a customer based on the location of a customer’s device, storing data in a database, and tracking browser activities of a customer were well-known prior to Mr. Kannan’s invention, and did not add any significant additional elements that would transform the abstract idea into patentable subject matter.

In its review of the Examiner’s decision, the Board applied the two-step *Alice* test, as well as the USPTO’s Guidance, which is discussed in detail in the two articles above. As to step 1, the Board found that Claim 1 recited a process, including a number of steps, and Claim 10 recited an apparatus. Therefore, both claims were directed to potentially patent eligible subject matter under Section 101.

Under the first prong of Step 2 of the Guidance, the Board agreed with the Examiner’s analysis that Claims 6 and 10 are directed to “judicially excepted” subject matter that may not be patentable. The Board agreed that since the claimed activities merely involve collecting data, analyzing data, and displaying the result of the data analysis, they can be performed mentally or with pen and paper. Likewise, the Board also agreed that the cited functions merely use the analysis of a commercial interaction or transaction between a consumer and a merchant to determine whether to provide a customized survey to the consumer, so that the

claim also constitutes a method of organizing human activity, which is also judicially excluded.

However, the Board disagreed with the Examiner that the claims did not recite additional elements that integrate the judicial exception into a practical application under the second prong of Step 2 of the Guidance. The Board found instead that the claimed inventions constituted an improvement of the technology used to generate and deliver customized customer surveys, and improved the functionality of the computers used to perform functions in a way that could not be performed previously. The Board relied on the specification, which discussed past problems with low survey participation resulting from the use of static, hard-coded surveys that used a standard look and feel. The specification also discussed the need to provide an improved type of survey tailored to the specific customer based on specific customer interactions with the website and other enumerated factors.

The Board found that the claim limitations captured the technological improvement discussed in the specification. In particular, the Board noted that the claim's recitation of a computer's use of a machine learning or statistical model to analyze a customer's browsing and purchasing activities at a vendor's website to derive a numerical assessment, which is correlated with the customer's predicted intent when compared to a predetermined threshold, in order to tailor a survey around the specific purchasing and browsing patterns of the customer, was sufficient to integrate the "judicial exception" into a practical application. In doing so, the Board agreed with Mr. Kannan's argument that while statistical modeling can be performed with pen and paper, the operation of the processor which transforms collected customer data into a customer's predicted intent, and then uses that data to create a specific survey that varies from customer to customer is a technological improvement over the prior art.

The Board's decision is yet another reminder of the importance of providing a detailed description in the specification of how the invention is a technological improvement over the existing state of the art. It is equally important that the features of the method, device or system that constitute the technological improvement be specifically claimed. Doing so will likely result in a higher probability that the claims will be found to be directed to patentable subject matter under Section 101.

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