

October 2019 Update: Subject Matter Eligibility

The *2019 Revised Patent Subject Matter Eligibility Guidance* (2019 PEG) published on January 7, 2019 (84 Fed. Reg. 50), and comments were solicited from the public.¹ Numerous comments were received, and have been reviewed. Using further explanation and examples, this update responds to the five major themes from the comments.² Note, the feedback received was primarily directed to examination procedures and, accordingly, this update focuses on clarifying practice for patent examiners. However, all USPTO personnel are expected to follow the guidance.³

In the discussion below, the response to each theme is addressed in a separate section as follows, including further explanation on:

- (I) evaluating whether a claim recites a judicial exception;
- (II) the groupings of abstract ideas enumerated in the 2019 PEG;
- (III) evaluating whether a judicial exception is integrated into a practical application;
- (IV) the *prima facie* case and the role of evidence with respect to eligibility rejections; and
- (V) the application of the 2019 PEG in the patent examining corps.

Three appendices are also attached. The first appendix (Appendix 1) provides new examples that are illustrative of major themes from the comments. The second appendix (Appendix 2) is a comprehensive index of examples for use with the 2019 PEG, including examples issued prior to the publication of the 2019 PEG. The third appendix (Appendix 3) lists and discusses selected eligibility cases from the U.S. Supreme Court and the U.S. Court of Appeals for the Federal Circuit.

I. Evaluating Whether A Claim Recites A Judicial Exception At Step 2A Prong One

The following discussion provides more information about how to determine whether a claim recites a judicial exception.

A. Meaning Of “Recites”

In Step 2A Prong One, the 2019 PEG instructs examiners to evaluate whether a claim recites a judicial exception, i.e., an abstract idea enumerated in Section I of the 2019 PEG, a law of nature, or a natural phenomenon. The 2019 PEG did not change the meaning of “recites” from how this term is used in the Manual of Patent Examining Procedure (MPEP).⁴ That is, a claim recites a judicial exception when the judicial exception is “set forth” or “described” in the claim. While the terms “set forth” and “describe” are thus both equated with “recite,” their different language is intended to indicate that there are two ways in which an exception can be recited in a claim. For instance, the claims in *Diamond v. Diehr* clearly stated a mathematical equation in the repetitively calculating step, such that the claims “set forth” an identifiable judicial exception, but the claims in *Alice Corp. v. CLS Bank*, “described” the concept of intermediated settlement without ever explicitly using the words “intermediated” or “settlement.”

Thus, when determining whether a claim “recites” a judicial exception, examiners should:

- evaluate the claim to determine whether it sets forth or describes an **abstract idea** in accordance with the examination instructions in the 2019 PEG and the groupings of abstract ideas that are further clarified in Section II of this update;
- evaluate the claim to determine whether it sets forth or describes a **product of nature** in accordance with the guidance in MPEP 2106.04(b) and (c), including the markedly different characteristics analysis; and

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- evaluate the claim to determine whether it sets forth or describes a *law of nature or a natural phenomenon other than a product of nature* in accordance with the guidance in MPEP 2106.04(b).

Specific examples of how to perform these evaluations of whether a claim sets forth or describes an exception under the 2019 PEG are found in Examples 37-43 and 45-46 (abstract ideas), Examples 43 and 45 (laws of nature), and Examples 43-44 (products of nature). Additional examples of how to identify whether a claim recites a law of nature or natural phenomenon are found in the pre-PEG examples 9-18 and 28-31.

B. Multiple Judicial Exceptions Recited In A Claim

Clarification was requested on how claims reciting multiple judicial exceptions are treated. A claim can recite more than one judicial exception (i.e., abstract idea, law of nature, or natural phenomenon).⁵ In some claims, the multiple exceptions are distinct from each other, e.g., a first limitation describes a law of nature, and a second limitation elsewhere in the claim recites an abstract idea. In these cases, examiners should continue to follow existing guidance in MPEP 2106.05(II) when analyzing the claims for eligibility.⁶

Other claims may recite multiple abstract ideas, which may fall in the same or different groupings, or multiple laws of nature. In these cases, examiners should not parse the claim. For example, in a claim that includes a series of steps that recite mental steps as well as a mathematical calculation, an examiner should identify the claim as reciting both a mental process and a mathematical concept for Step 2A Prong One to make the analysis clear on the record. However, if possible, the examiner should consider the limitations together to be an abstract idea for Step 2A Prong Two and Step 2B (if necessary) rather than a plurality of separate abstract ideas to be analyzed individually.⁷ This is illustrated in, e.g., Example 45 (Controller for Injection Mold), and Example 46 (Livestock Management).

II. The Groupings Of Abstract Ideas Enumerated In The 2019 PEG

The 2019 PEG sets forth a test that distills the relevant case law to aid in examination, and does not attempt to articulate each and every decision. As further explained in the 2019 PEG, the Office has shifted its approach from the case-comparison approach in determining whether a claim recites an abstract idea and instead uses enumerated groupings of abstract ideas.⁸ The enumerated groupings are firmly rooted in Supreme Court precedent as well as Federal Circuit decisions interpreting that precedent. By grouping the abstract ideas, the 2019 PEG shifts examiners' focus from relying on individual cases to generally applying the wide body of case law spanning all technologies and claim types. In sum, the 2019 PEG synthesizes the holdings of various court decisions to facilitate examination.

Additional guidance on identifying abstract ideas enumerated in the 2019 PEG and their relationship to judicial decisions was requested. The 2019 PEG instructs examiners to refer to the groupings of abstract ideas enumerated in Section I of the 2019 PEG (i.e., mathematical concepts, certain methods of organizing human activities, and mental processes) in order to identify abstract ideas.⁹ These groupings are not mutually exclusive, i.e., some claims may recite limitations that fall within more than one abstract idea grouping or sub-grouping enumerated in the 2019 PEG. For example, a claim reciting performing mathematical calculations using a formula that could be practically performed in the human mind may be considered to fall within the mathematical concepts grouping and the mental process grouping. Examiners should identify at least one abstract

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idea grouping, but preferably identify all groupings to the extent possible, if a claim limitation(s) is determined to fall within multiple groupings, and proceed with the analysis in Step 2A Prong Two. This is illustrated in, e.g., Example 45 (Controller for Injection Mold). Under the 2019 PEG, if an examiner has an application with a claim limitation that does not fall clearly within the enumerated groupings of abstract ideas, but the examiner nonetheless determines, based on a Supreme Court or Federal Circuit decision, that the claim limitation should be treated as reciting an abstract idea, the examiner should bring the application to the attention of their Technology Center (TC) Director, as described below in Section I.D.¹⁰ The following discussion is meant to provide more information about the enumerated groupings of abstract ideas.

A. Mathematical Concepts

The 2019 PEG defines “mathematical concepts” as mathematical relationships, mathematical formulas or equations, and mathematical calculations. Clarification was requested about the scope of the “mathematical concepts” grouping, and in particular, examples of each type of mathematical concept were requested.

Suggestions were made that the Office should distinguish between the types of math recited in claims when making an eligibility determination. After consideration, the current “mathematical concepts” grouping will be retained because it is consistent with the case law. The courts have declined to distinguish between the types of math recited in a claim when evaluating claims for eligibility. For example, in *Parker v. Flook*, the Court found that the claim recited a mathematical formula.¹¹ This determination was not altered by the fact that the math was being used to solve an engineering problem (i.e., updating an alarm limit during catalytic conversion processes).

When determining whether a claim recites a mathematical concept (i.e., mathematical relationships, mathematical formulas or equations, and mathematical calculations), examiners should consider whether the claim recites a mathematical concept or merely includes limitations that are based on or involve a mathematical concept. A claim does not recite a mathematical concept (i.e., the claim limitations do not fall within the mathematical concept grouping), if it is only based on or involves a mathematical concept.¹² For example, a limitation that is merely based on or involves a mathematical concept described in the specification may not be sufficient to fall into this grouping, provided the mathematical concept itself is not recited in the claim.¹³

Specific examples of claims reciting mathematical concepts issued with or after the 2019 PEG are found in Example 41 (Cryptographic Communications), Example 43 (Treating Kidney Disease), and Example 45 (Controller for Injection Molding).

i. “*Mathematical Relationships*”

A mathematical relationship is a relationship between variables or numbers. A mathematical relationship may be expressed in words or using mathematical symbols. For example, pressure (p) can be described as the ratio between the magnitude of the normal force (F) and area of the surface on contact (A), or it can be set forth in the form of an equation such as $p = F/A$.

Examples of mathematical relationships recited in a claim include:

- a relationship between reaction rate and temperature, which relationship can be expressed in the form of a formula called the Arrhenius equation, *Diamond v. Diehr*;¹⁴
- a conversion between binary-coded decimal and pure binary numerals, *Gottschalk v. Benson*;¹⁵ and

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- a mathematical relationship between enhanced directional radio activity and antenna conductor arrangement (i.e., the length of the conductors with respect to the operating wave length and the angle between the conductors), *Mackay Radio & Tel. Co. v. Radio Corp. of Am.*¹⁶

ii. “Mathematical Formulas or Equations”

A claim that recites a numerical formula or equation will be considered as falling within the “mathematical concepts” grouping. In addition, there are instances where a formula or equation is written in text format that should also be considered as falling within this grouping. For example, the phrase “determining a ratio of A to B” is merely a textual replacement for the particular equation (ratio = A/B). Additionally, the phrase “calculating the force of the object by multiplying its mass by its acceleration” is a textual replacement for the particular equation (F= ma).

Examples of mathematical equations or formulas recited in a claim include:

- a Arrhenius equation, *Diamond v. Diehr*;¹⁷
- a formula for computing an alarm limit, *Parker v. Flook*;¹⁸ and
- a mathematical formula for hedging (claim 4), *Bilski v. Kappos*.¹⁹

iii. “Mathematical Calculations”

A claim that recites a mathematical calculation will be considered as falling within the “mathematical concepts” grouping. A mathematical calculation is a mathematical operation (such as multiplication) or an act of calculating using mathematical methods to determine a variable or number, e.g., performing an arithmetic operation such as exponentiation. There is no particular word or set of words that indicates a claim recites a mathematical calculation. That is, a claim does not have to recite the word “calculating” in order to be considered a mathematical calculation. For example, a step of “determining” a variable or number using mathematical methods or “performing” a mathematical operation may also be considered mathematical calculations when the broadest reasonable interpretation of the claim in light of the specification encompasses a mathematical calculation.

Examples of mathematical calculations recited in a claim include:

- performing a resampled statistical analysis to generate a resampled distribution, *SAP Am., Inc. v. InvestPic, LLC*;²⁰
- calculating a number representing an alarm limit value using the mathematical formula “ $B_1=B_0(1.0-F) + PVL(F)$,” *Parker v. Flook*;²¹ and
- using a formula to convert geospatial coordinates into natural numbers, *Burnett v. Panasonic Corp.*²²

B. Certain Methods of Organizing Human Activity

Clarification was requested about the scope of the “certain methods of organizing human activity” grouping. In particular, examples of fundamental economic principles or practices, commercial or legal interactions, and managing personal behavior, relationships or interactions between people were requested.

The term “certain” qualifies the “certain methods of organizing human activity” grouping as a reminder of several important points. First, not all methods of organizing human activity are

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abstract ideas (e.g., “a defined set of steps for combining particular ingredients to create a drug formulation” is not a “certain method of organizing human activity”).²³ Second, this grouping is limited to activity that falls within the enumerated sub-groupings of fundamental economic principles or practices, commercial or legal interactions, managing personal behavior, and relationships or interactions between people, and is not to be expanded beyond these enumerated sub-groupings except in rare circumstances as explained in Section III(C) of the 2019 PEG. Finally, the sub-groupings encompass both activity of a single person (for example, a person following a set of instructions or a person signing a contract online) and activity that involves multiple people (such as a commercial interaction), and thus, certain activity between a person and a computer (for example a method of anonymous loan shopping that a person conducts using a mobile phone) may fall within the “certain methods of organizing human activity” grouping. The number of people involved in the activity is not dispositive as to whether a claim limitation falls within this grouping. Instead, the determination should be based on whether the activity itself falls within one of the sub-groupings.

i. “Fundamental Economic Practices or Principles”

Under the 2019 PEG, “fundamental economic principles or practices,” which describe subject matter relating to the economy and commerce, are considered to be a “certain method of organizing human activity.” According to the 2019 PEG, “fundamental economic principles or practices” include hedging, insurance, and mitigating risk. The term “fundamental” is not used in the sense of necessarily being “old” or “well-known,”²⁴ although being old or well-known may indicate that the practice is “fundamental.”²⁵

MPEP 2106.04(a)(2)(I) provides examples of “fundamental economic principles or practices.” Additional examples of “fundamental economic practices or principles” not discussed in this MPEP section include:

- local processing of payments for remotely purchased goods, *Inventor Holdings, LLC v. Bed Bath & Beyond, Inc.*;²⁶
- using a marking affixed to the outside of a mail object to communicate information about the mail object, i.e., the sender, recipient, and contents of the mail object, *Secured Mail Solutions LLC v. Universal Wilde, Inc.*;²⁷ and
- placing an order based on displayed market information, *Trading Technologies Int'l, Inc. v. IBG LLC*.²⁸

ii. “Commercial or Legal Interactions”

According to the 2019 PEG, “commercial interactions” or “legal interactions” include subject matter relating to agreements in the form of contracts, legal obligations, advertising, marketing or sales activities or behaviors, and business relations.

Examples of subject matter where the commercial or legal interaction is an agreement in the form of contracts include:

- a transaction performance guaranty, which is a contractual relationship, *buySAFE, Inc. v. Google, Inc.*;²⁹ and

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- processing insurance claims for a covered loss or policy event under an insurance policy (i.e., an agreement in the form of a contract), *Accenture Global Services GmbH v. Guidewire Software, Inc.*³⁰

Examples of subject matter where the commercial or legal interaction is a legal obligation include:

- tax-free exchanges of real estate, where the exchange is a legal obligation, *Fort Properties, Inc. v. American Master Lease LLC*;³¹ and
- arbitration (i.e., resolving a legal dispute between two parties using an arbitrator), *In re Comiskey*.³²

Examples of subject matter where the commercial or legal interaction is advertising, marketing or sales activities or behaviors include:

- using advertising as an exchange or currency, *Ultramercial, Inc. v. Hulu, LLC*;³³
- offer-based price optimization, which pertains to marketing, *OIP Techs., Inc. v. Amazon.com, Inc.*;³⁴ and
- structuring of a sales force or marketing company, which pertains to marketing or sales activities or behaviors, *In re Ferguson*.³⁵

Examples of subject matter where the commercial or legal interaction is business relations include:

- processing a credit application between a customer and dealer, where the business relation is the relationship between the customer and the dealer during the vehicle purchase, *Credit Acceptance Corp. v. Westlake Services*;³⁶ and
- processing information through a clearinghouse, where the business relation is the relationship between a party that submitted a credit application (e.g., a car dealer) and funding sources (e.g., banks) when processing credit applications, *Dealertrack v. Huber*.³⁷

For additional discussion and examples of commercial or legal interactions, see MPEP 2106.04(a)(2)(II)(A)-(B).

iii. “Managing Personal Behavior or Relationships or Interactions Between People”

According to the 2019 PEG, “managing personal behavior or relationships or interactions between people” includes social activities, teaching, and following rules or instructions. Examples of these sub-groups include subject matter such as:

- a set of rules for playing a dice game, *In re Marco Guldenaar Holding B.V.*;³⁸
- voting, verifying the vote, and submitting the vote for tabulation, *Voter Verified, Inc. v. Election Systems & Software LLC*;³⁹
- assigning hair designs to balance head shape, *In re Brown*;⁴⁰ and
- a series of instructions of how to hedge risk, *Bilski v. Kappos*.⁴¹

For additional examples relating to managing human behavior, see MPEP 2106.04(a)(2)(II)(C).

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C. Mental Processes

Under the 2019 PEG, the “mental processes” grouping is defined as concepts performed in the human mind, and examples of mental processes include observations, evaluations, judgments, and opinions. Because both product and process claims may recite a “mental process,” the phrase “mental processes” should be understood as referring to the type of abstract idea, and not to the statutory category of the claim.⁴² Additional information was requested about how an examiner evaluates whether a claim recites a mental process. Accordingly, the following discussion is meant to guide examiners and provide more information on how to determine whether a claim recites a mental process. Examiners should keep in mind the following points when performing this evaluation.

i. *A Claim With Limitation(s) That Cannot Practically Be Performed In The Human Mind Does Not Recite A Mental Process*

Claims do not recite a mental process when they do not contain limitations that can practically be performed in the human mind, for instance when the human mind is not equipped to perform the claim limitations.⁴³ Examples of claims that do not recite mental processes because they cannot be practically performed in the human mind include:

- a claim to a method for calculating an absolute position of a GPS receiver and an absolute time of reception of satellite signals, where the claimed GPS receiver calculated pseudoranges that estimated the distance from the GPS receiver to a plurality of satellites, *SiRF Technology, Inc. v. International Trade Commission*;⁴⁴
- a claim to detecting suspicious activity by using network monitors and analyzing network packets, *SRI Int'l, Inc. v. Cisco Systems, Inc.*;⁴⁵
- a claim to a specific data encryption method for computer communication involving a several-step manipulation of data, *Synopsys, Inc. v. Mentor Graphics Corp.* (distinguishing the claims in *TQP Development, LLC v. Intuit Inc.*);⁴⁶ and
- a claim to a method for rendering a halftone image of a digital image by comparing, pixel by pixel, the digital image against a blue noise mask, where the method required the manipulation of computer data structures (e.g., the pixels of a digital image and a two-dimensional array known as a mask) and the output of a modified computer data structure (a halftoned digital image), *Research Corp. Techs. v. Microsoft Corp.*⁴⁷

Specific examples of claims that do not recite a mental process issued with or after the 2019 PEG are found in Example 37 (Relocation of Icons on a Graphical User Interface – claim 2), Example 38 (Simulating an Analog Audio Mixer), and Example 39 (Method for Training a Neural Network for Facial Detection).

In contrast, claims do recite a mental process when they contain limitations that can practically be performed in the human mind, including for example, observations, evaluations, judgments, and opinions. Examples of claims that recite mental processes include:

- a claim to “collecting information, analyzing it, and displaying certain results of the collection and analysis,” where the data analysis steps are recited at a high level of generality such that they could practically be performed in the human mind, *Electric Power Group, LLC v. Alstom, S.A.*;⁴⁸

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- claims to “comparing BRCA sequences and determining the existence of alterations,” where the claims cover any way of comparing BRCA sequences such that the comparison steps can practically be performed in the human mind, *University of Utah Research Foundation v. Ambray Genetics Corp.*;⁴⁹
- a claim to collecting and comparing known information (claim 1), which are steps that can be practically performed in the human mind, *Classen Immunotherapies, Inc. v. Biogen IDEC*;⁵⁰ and
- a claim to identifying head shape and applying hair designs, which is a process that can be practically performed in the human mind, *In re Brown*.⁵¹

Specific examples of claims that do recite a mental process issued with or after the 2019 PEG are found in Example 37 (Relocation of Icons on a Graphical User Interface – claims 1 and 3), Example 40 (Adaptive Monitoring of Network Traffic Data), Example 43 (Treating Kidney Disease), Example 45 (Controller for Injection Molding), and Example 46 (Livestock Management).

ii. *A Claim That Requires A Computer May Still Recite A Mental Process*

Claims can recite a mental process even if they are claimed as being performed on a computer.⁵² Suggestions were made that an examiner should determine that a claim, when given its broadest reasonable interpretation, recites a mental process only when the claim is performed *entirely* in the human mind. After consideration, this suggestion will not be adopted, and the current “mental processes” grouping in the 2019 PEG will be retained, since it is consistent with current case law. The courts have found claims requiring a generic computer or nominally reciting a generic computer may still recite a mental process even though the claim limitations are not performed entirely in the human mind.⁵³

In evaluating whether a claim that requires a generic computer recites a mental process, examiners should carefully consider the broadest reasonable interpretation of the claim in light of the specification. By way of example, examiners may review the specification to determine if the underlying claimed invention is described as a concept that is performed in the human mind and applicant is merely claiming that concept performed 1) on a generic computer, 2) in a computer environment or 3) is merely using a computer as a tool to perform the concept. In these situations, the claim is considered to recite a mental process. For instance, in *Voter Verified, Inc. v. Election Systems & Software LLC*, the Federal Circuit relied upon the specification in explaining that the claimed steps of voting, verifying the vote, and submitting the vote for tabulation are human cognitive actions that humans have performed for hundreds of years despite the fact that the steps in the claim were performed on a computer.⁵⁴

Furthermore, examiners should keep in mind that both product claims (e.g., computer system, computer-readable medium, etc.) and process claims may recite mental processes.⁵⁵ For example, in *Mortgage Grader, Inc. v. First Choice Loan Servs., Inc.*, the patentee claimed a computer-implemented system and a method for enabling borrowers to anonymously shop for loan packages offered by a plurality of lenders, comprising a database that stores loan package data from the lenders, and a computer system providing an interface and a grading module. The Federal Circuit held that the computer-implemented system and method for “anonymous loan shopping” was an abstract idea because it could be “performed by humans without a computer.”⁵⁶

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iii. *A Claim That Encompasses A Human Performing The Step(s) Mentally With The Aid Of A Pen And Paper Recites A Mental Process*

If a claim recites a limitation that can practically be performed in the human mind, the limitation falls within the mental processes grouping, and the claim recites an abstract idea.⁵⁷ The use of a physical aid (i.e., the pen and paper) to help perform a mental step (e.g., a mathematical calculation) does not negate the mental nature of this limitation.⁵⁸ For instance, Example 45 (Controller for Injection Molding) illustrates how a claim that encompasses a human performing a step mentally with a physical aid recites a mental process. *CyberSource Corp. v. Retail Decisions, Inc.* provides another example. In that case, the court determined that the claimed step of “constructing a map of credit card numbers” was a limitation that was able to be performed “by writing down a list of credit card transactions made from a particular IP address.” In making this determination, the court looked to the specification, which disclosed that the claimed map was nothing more than a listing of several (e.g., four) credit card transactions. The court determined that this step was able to be performed mentally with a pen and paper, and therefore, qualifies as a mental process.⁵⁹ While a claim limitation to a process that “can be performed in the human mind, or by a human using a pen and paper” qualifies as a mental process, a claim limitation that “could not, as a practical matter, be performed entirely in a human’s mind” (even if aided with pen and paper) would not qualify as a mental process.⁶⁰

D. Tentative Abstract Idea Procedure

The 2019 PEG sets forth a procedure for handling tentative abstract ideas. Clarification was requested about this procedure (e.g., whether the Office will notify the public if the procedure is used, whether an interview with a TC director will be granted, etc.), and suggestions were made for modifications to this procedure. The following discussion provides additional clarification regarding this procedure.

The TC Director will give approval for any subject matter eligibility rejection of a claim including a tentative abstract idea using the procedure in the 2019 PEG. The ensuing Office action will identify that the claim(s) are directed to a previously non-enumerated abstract idea via form paragraph 7.05.017 and include the TC Director’s signature. Before signature, the TC Director will inform Patents Management that this procedure has been used. Once such an Office action issues, the public will be notified, for example, on [USPTO.GOV/PatentEligibility](https://www.uspto.gov/patenteligibility).

In response to a rejection based on failure to claim patent-eligible subject matter, an interview with the examiner may be conducted, which may help advance prosecution and identify patent eligible subject matter.⁶¹ For applications in which an abstract idea has been identified using the tentative abstract idea procedure, an interview with the TC Director that provided approval is not necessary because the examiner retains the authority to withdraw or maintain rejection upon consideration of applicant’s reply. The examiner is not required to obtain TC Director approval to withdraw or maintain such a § 101 subject matter eligibility rejection.

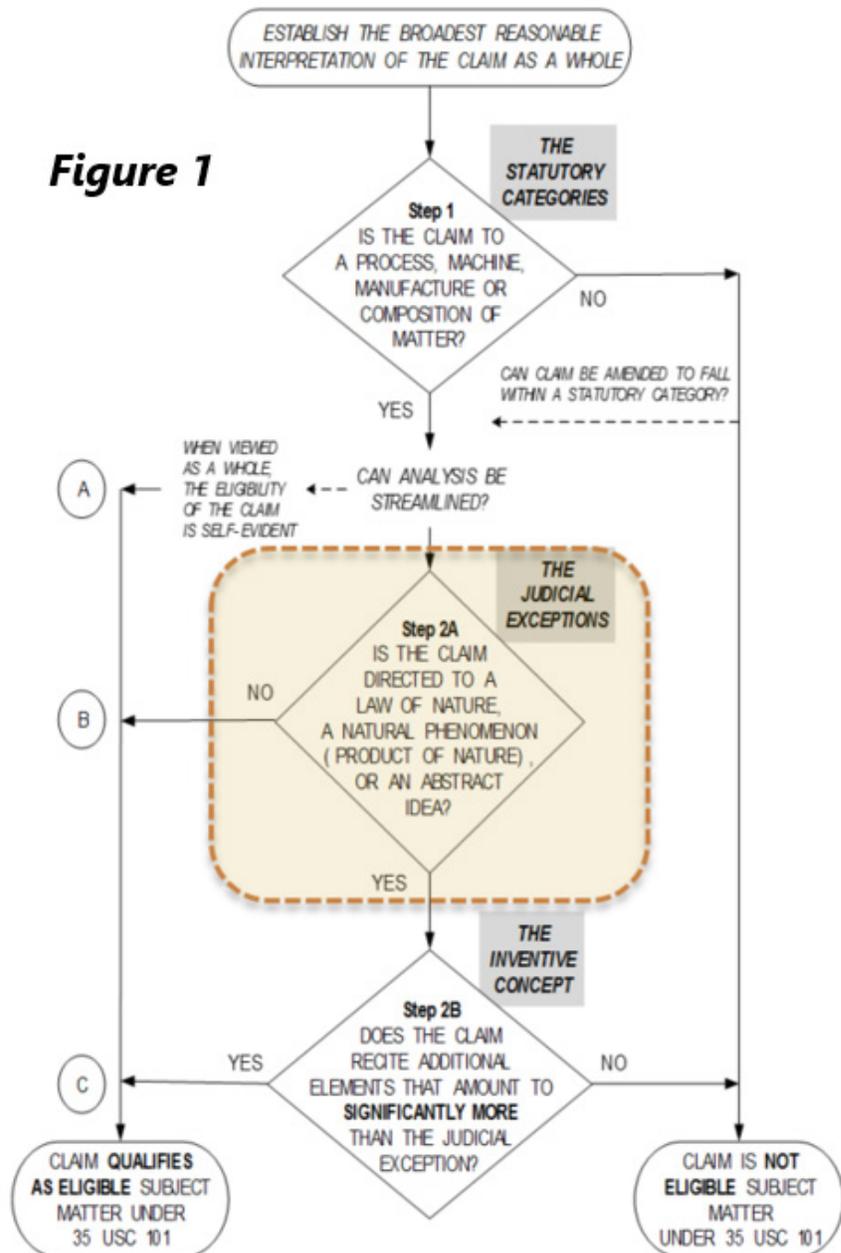
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III. Evaluating Whether A Judicial Exception Is Integrated Into A Practical Application At Step 2A Prong Two

A. Integration into a Practical Application

According to the 2019 PEG, the question of whether a claim is “directed to” a judicial exception in Step 2A is now evaluated using a two-prong inquiry. Prong One, which is discussed in Section I of this Update, asks if the claim “recites” an abstract idea, law of nature, or natural phenomenon. Under that prong, the mere inclusion of a judicial exception such as a mathematical formula (which is one of the mathematical concepts identified as an abstract idea in Section I of the PEG) in a claim means that the claim “recites” a judicial exception. However, mere recitation of a judicial exception does not mean that the claim is “directed to” that judicial exception under Step 2A Prong Two. Instead, under Prong Two, a claim that recites a judicial exception is not directed to that judicial exception, if the claim as a whole “integrates the recited judicial exception into a practical application of that exception.”⁶² Prong Two thus distinguishes claims that are “directed to” the recited judicial exception from claims that are not “directed to” the recited judicial exception.

Because the 2019 PEG did not change the overall subject matter eligibility analysis, no changes have been made to the existing eligibility flowchart in MPEP 2106(III), which is reproduced in Figure 1 (at right).

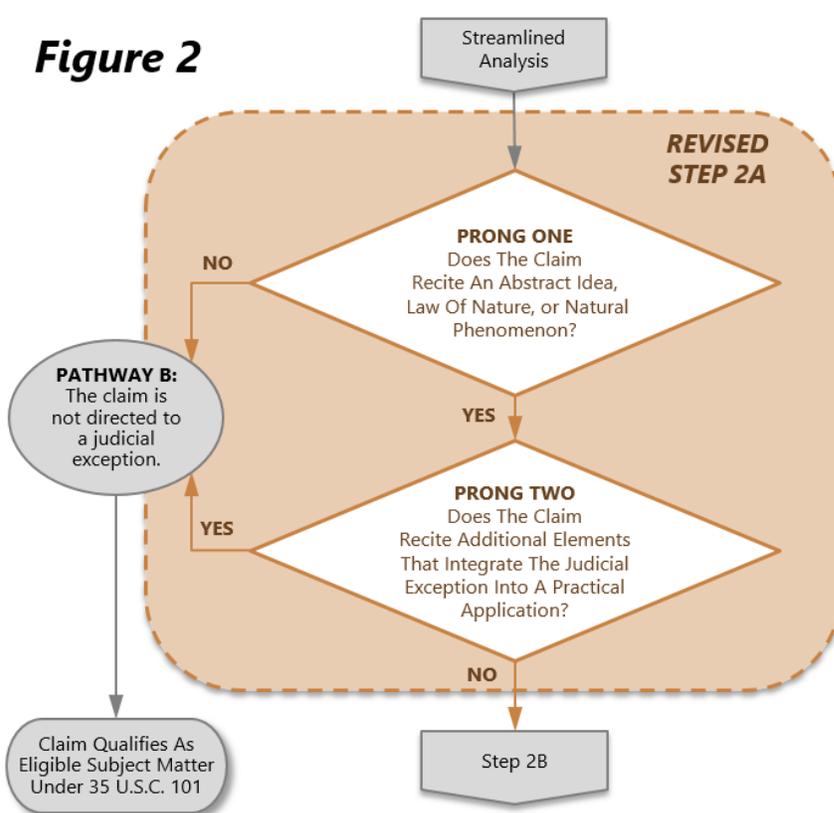


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Instead, a new mini-flowchart was created to depict the two-prong analysis that is now performed in order to answer the Step 2A inquiry. This mini-flowchart, which was used in USPTO training on the 2019 PEG, is also reproduced in Figure 2 (at right). These figures demonstrate how the revised Step 2A analysis created by the 2019 PEG fits into the overall eligibility analysis set forth in the MPEP. As shown in Figure 2 and described in the 2019 PEG at Section III, a claim reciting a judicial exception is now eligible at revised Step 2A unless that exception is not integrated into a practical application of the exception.⁶³

As explained in the 2019 PEG, the evaluation of Prong Two requires the use of the considerations (e.g. improving technology, effecting a particular treatment or prophylaxis, implementing with a particular machine, etc.) identified by the Supreme Court and the Federal Circuit, to ensure that the claim as a whole “integrates [the] judicial exception into a practical application [that] 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.”⁶⁴ These considerations are set forth in the 2019 PEG, MPEP 2106.05(a) through (c), and MPEP 2106.05(e) through (h). Note, a specific way of achieving a result is not a stand-alone consideration in Step 2A Prong Two. However, the specificity of the claim limitations is relevant to the evaluation of several considerations including the use of a particular machine, particular transformation and whether the limitations are mere instructions to apply an exception.⁶⁵ If the claim integrates the judicial exception into a practical application based upon evaluation of these considerations, the additional limitations impose a meaningful limit on the judicial exception, and the claim is eligible at Step 2A.

For example, if the additional limitations reflect an improvement in the functioning of a computer, or an improvement to another technology or technical field, the claim integrates the judicial exception into a practical application and thus imposes a meaningful limit on the judicial exception. No further analysis is required. The claim is eligible at Step 2A. For instance, in *SRI International, Inc. v. Cisco Systems, Inc.*, the court concluded the claim recited using a plurality of network monitors to analyze specific network traffic data and integrate generated reports from the monitors to identify hackers and intruders on the network constituted an improvement in computer network technology.⁶⁶ Since the claim improves technology, the claim imposes meaningful limits on any recited judicial exception, and the claim would be eligible under the 2019 PEG at least at Step 2A Prong Two. Conversely, not all claims that recite computer components, for example, integrate a judicial exception into a practical application based upon evaluation of the considerations. In *Alice*



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Corp. Pty. Ltd. v. CLS Bank Int'l, the Supreme Court determined that the claim limitations “data processing system,” “communications controller,” and “data storage unit” were generic computer components that amounted to mere instructions to implement the abstract idea on a computer.⁶⁷ Such limitations would not be sufficient to demonstrate integration of a judicial exception into a practical application, and accordingly the analysis of the claims must proceed to Step 2B.

As also explained in the 2019 PEG, the Prong Two analysis considers the claim as a whole. That is, the limitations containing the judicial exception as well as the additional elements in the claim besides the judicial exception need to be evaluated together to determine whether the claim integrates the judicial exception into a practical application. The additional limitations should not be evaluated in a vacuum, completely separate from the recited judicial exception. Instead, the analysis should take into consideration all the claim limitations and how those limitations interact and impact each other when evaluating whether the exception is integrated into a practical application. For example in *Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*, the court determined the claim recited the abstract idea of “filtering.”⁶⁸ However, it concluded the claimed invention improved technology because the filtering tool was installed at a specific location, remote from the end-users, with customizable filtering features specific to each end user which provided both the benefits of a filter at a local computer and on an ISP server.⁶⁹ In determining whether the claimed invention improves technology, the court considered the filtering limitations in combination with the remaining limitations.

B. An Improvement in the Functioning of a Computer or an Improvement to Other Technology or Technical Field

An important consideration to evaluate when determining whether the claim as a whole integrates a judicial exception into a practical application is whether the claimed invention improves the functioning of a computer or other technology. The courts have not provided an explicit test for this consideration. However, MPEP 2106.04(a) and 2106.05(a) provide a detailed explanation of how to perform this analysis. In short, first the specification should be evaluated to determine if the disclosure provides sufficient details such that one of ordinary skill in the art would recognize the claimed invention as providing an improvement. The specification need not explicitly set forth the improvement, but it must describe the invention such that the improvement would be apparent to one of ordinary skill in the art. Conversely, if the specification explicitly sets forth an improvement but in a conclusory manner (i.e., a bare assertion of an improvement without the detail necessary to be apparent to a person of ordinary skill in the art), the examiner should not determine the claim improves technology. Second, if the specification sets forth an improvement in technology, the claim must be evaluated to ensure that the claim itself reflects the disclosed improvement. That is, the claim includes the components or steps of the invention that provide the improvement described in the specification. The claim itself does not need to explicitly recite the improvement described in the specification (e.g., “thereby increasing the bandwidth of the channel”).

The improvement analysis under the 2019 PEG differs in some respects from prior guidance. Under prior guidance, at both Steps 2A and 2B, the improvements analysis considered whether the claimed invention improves upon conventional technology.⁷⁰ Under the 2019 PEG, in contrast, the “improvements” analysis in Step 2A determines whether the claim pertains to an improvement to the functioning of a computer or to another technology without reference to what is well-understood, routine, conventional activity. That is, the claimed invention may integrate the judicial exception into a practical application by demonstrating that it improves the relevant existing

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technology although it may not be an improvement over well-understood, routine, conventional activity.

Consideration of improvements is relevant to the integration analysis regardless of the technology of the claimed invention. That is, the consideration applies equally whether it is a computer-implemented invention, an invention in the life sciences, or any other technology. See, e.g., *Rapid Litigation Management Ltd. v. CellzDirect, Inc.*, in which the court noted that a claimed process for preserving hepatocytes could be eligible as an improvement to technology because the claim achieved a new and improved way for preserving hepatocyte cells for later use, even though the claim is based on the discovery of something natural.⁷¹ Notably, the court did not distinguish between the types of technology when determining that the invention improved technology. However, it is important to keep in mind that an improvement in the judicial exception itself (e.g., a recited fundamental economic concept) is not an improvement in technology. For example, in *Trading Technologies Int'l v. IBG LLC*, the court determined that the claim simply provided a trader with more information to facilitate market trades, which improved the business process of market trading but did not improve computers or technology.⁷² Note, there is no requirement for the judicial exception to provide the improvement. The improvement can be provided by one or more additional elements (as in *Diehr*), or by the additional element(s) in combination with the recited judicial exception (as in *Finjan*).⁷³ Thus, it is important for examiners to analyze the claim as a whole when determining whether the claim provides an improvement to the functioning of computers or an improvement to other technology or technical field.

During examination, the examiner should analyze the “improvements” consideration by evaluating the specification and the claims to ensure that a technical explanation of the asserted improvement is present in the specification, and that the claim reflects the asserted improvement. Generally, examiners are not expected to make a qualitative judgment on the merits of the asserted improvement. If the examiner concludes the disclosed invention does not improve technology, the burden shifts to applicant to provide persuasive arguments supported by any necessary evidence to demonstrate that one of ordinary skill in the art would understand that the disclosed invention improves technology. Any such evidence submitted under 37 C.F.R. § 1.132 must establish what the specification would convey to one of ordinary skill in the art and cannot be used to supplement the specification.⁷⁴ For example, in response to a rejection under 35 U.S.C. § 101, an applicant could submit a declaration under § 1.132 providing testimony on how one of ordinary skill in the art would interpret the disclosed invention as improving technology and the underlying factual basis for that conclusion.

C. Applying or Using a Judicial Exception to Effect a Particular Treatment or Prophylaxis for a Disease or Medical Condition

The 2019 PEG includes a “treatment/prophylaxis” consideration, under which a claim can integrate a judicial exception into a practical application by applying or using the judicial exception to effect a particular treatment or prophylaxis for a disease or medical condition. This consideration originated as part of the “Other Meaningful Limitations” consideration discussed in MPEP 2106.05(e), and was also based on the USPTO’s June 2018 *Vanda* Memorandum which stated that method of treatment claims that practically apply natural relationships are eligible at Step 2A.⁷⁵ This consideration encompasses the integration of any type of judicial exception into a practical application, including abstract ideas such as the mental comparison of immunization-related information in *Classen Immunotherapies, Inc. v. Biogen IDEC*, which was practically applied by actually immunizing mammals in accordance with a particular immunization schedule.⁷⁶ This

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consideration encompasses both treatment and prophylaxis limitations, including, *e.g.*, acupuncture, administration of medication, dialysis, organ transplants, phototherapy, physiotherapy, radiation therapy, surgery, and the like.

When determining whether a claim applies or uses a recited judicial exception to effect a particular treatment or prophylaxis for a disease or medical condition, the following factors are relevant.

i. *The Particularity Or Generality Of The Treatment Or Prophylaxis*

The treatment or prophylaxis limitation must be “particular,” *i.e.*, specifically identified so that it does not encompass all applications of the judicial exception(s). For example, consider a claim that recites mentally analyzing information to identify if a patient has a genotype associated with poor metabolism of beta blocker medications. This falls within the mental process grouping of abstract ideas enumerated in Section I of the 2019 PEG. The claim also recites “administering a lower than normal dosage of a beta blocker medication to a patient identified as having the poor metabolizer genotype.” This administration step is particular, and it integrates the mental analysis step into a practical application. Conversely, consider a claim that recites the same abstract idea and “administering a suitable medication to a patient.” This administration step is not particular, and is instead merely instructions to “apply” the exception in a generic way. Thus, the administration step does not integrate the mental analysis step into a practical application.

ii. *Whether The Limitation(s) Have More Than A Nominal Or Insignificant Relationship To The Exception(s)*

The treatment or prophylaxis limitation must have more than a nominal or insignificant relationship to the exception(s). For example, consider a claim that recites a natural correlation (law of nature) between blood glucose levels over 250 mg/dl and the risk of developing ketoacidosis (a life-threatening medical condition). The claim also recites “treating a patient having a blood glucose level over 250 mg/dl with insulin.” This administration step is particular and integrates the law of nature into a practical application. Alternatively, consider a claim that recites the same law of nature and also recites “treating a patient having a blood glucose level over 250 mg/dl with aspirin.” Aspirin is not known in the art as a treatment for ketoacidosis or diabetes, although some patients with diabetes may be on aspirin therapy for other medical reasons (*e.g.*, to control pain or inflammation, or to prevent blood clots). In the context of this claim and the recited correlation between high blood glucose levels and the risk of ketoacidosis, administration of aspirin has at best a nominal connection to the law of nature, because aspirin does not treat or prevent ketoacidosis. This step therefore does not apply or use the exception in any meaningful way. Thus, this step of administering aspirin does not integrate the law of nature into a practical application.

iii. *Whether The Limitation(s) Are Merely Extra-Solution Activity Or A Field Of Use*

The treatment or prophylaxis limitation must impose meaningful limits on the judicial exception, and cannot be extra-solution activity or a field-of-use. For example, consider a claim that recites (a) administering rabies and feline leukemia vaccines to a first group of domestic cats in accordance with different vaccination schedules, and (b) analyzing information about the vaccination schedules and whether the cats later developed chronic immune-mediated disorders to determine a lowest-risk vaccination schedule. Step (b) falls within the mental process grouping of abstract ideas enumerated in Section I of the 2019 PEG. While step (a) administers vaccines to the cats, this administration is performed in order to gather data for the mental analysis step, and is a necessary precursor for all uses of the recited exception. It is thus extra-solution activity, and does not

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integrate the judicial exception into a practical application. Conversely, consider a claim reciting the same steps (a) and (b), but also recites step (c) “vaccinating a second group of domestic cats in accordance with the lowest-risk vaccination schedule.” Step (c) applies the exception, in that the information from the mental analysis in step (b) is used to alter the order and timing of the vaccinations so that the second group of cats have a lower risk of developing chronic immune-mediated disorders. Step (c) thus integrates the abstract idea into a practical application.

D. Other Considerations in Step 2A, Prong Two

As discussed *supra* in Section III(A), the 2019 PEG identifies several other considerations in Step 2A Prong Two in addition to those already discussed. Considerations that may indicate integration include implementing the judicial exception with a particular machine or manufacture, effecting a particular transformation or reduction of an article, and applying the judicial exception in some other meaningful way. Considerations that may not indicate integration include merely reciting the words “apply it” or an equivalent, adding extra-solution activity, and generally linking the use of the judicial exception to a particular technological environment. These considerations have not changed from the guidance provided prior to the 2019 PEG except the improvements analysis discussed above in Section III(B) and extra-solution activity discussed below. See MPEP 2106.05(b)-2106.05(h) for more information and examples for each of these considerations.

The “extra-solution activity” consideration listed above has been slightly modified. MPEP 2106.05(g) explains, in the context of Step 2B, that whether a limitation is well-known is a factor to consider when determining if a limitation is extra-solution activity. However, well-known, routine, conventional activity is not a consideration at Step 2A in the 2019 PEG. Therefore, whether a claim limitation is extra-solution activity will not be based upon whether the limitation is well-known. Instead well-understood, routine, conventional activity will only be considered if the analysis proceeds to Step 2B. For specific examples of extra-solution activity that are unconventional, see Example 45 (Controller for Injection Mold).

IV. Requirements Of A *Prima Facie* Case

Suggestions were made that the Office emphasize the examiner’s burden of establishing a *prima facie* case when making a subject matter eligibility rejection. Accordingly, the following discussion reiterates the requirements of a *prima facie* case.

The legal concept of *prima facie* case is a procedural tool of patent examination, which allocates the burdens going forward between the examiner and the applicant. MPEP § 2106.07 discusses the requirements of a *prima facie* case of ineligibility. In particular, the initial burden is on the examiner to explain why a claim or claims are ineligible for patenting clearly and specifically, so that the applicant has sufficient notice and is able to effectively respond.⁷⁷ Examiners should review the record as a whole and make subject matter eligibility decisions on a claim-by-claim basis in accordance with the broadest reasonable interpretation of the claims.⁷⁸ Once the examiner has satisfied the initial burden, the burden of coming forward with evidence or argument shifts to the applicant. When evaluating a response, examiners must carefully consider all of applicant’s arguments and evidence rebutting the subject matter eligibility rejection. If applicant has amended the claim, examiners should determine the amended claim’s broadest reasonable interpretation and again perform the subject matter eligibility analysis.

MPEP 2106.07(a) provides a discussion of how to formulate a subject matter eligibility rejection.⁷⁹ Whenever practicable, examiners should indicate how subject matter eligibility rejections might be

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overcome. In light of the 2019 PEG, a “Step 2B” rejection based on a failure to claim an invention that is directed to patent-eligible subject matter (i.e., the claim is directed to a judicial exception without providing an inventive concept/significantly more at Step 2B of the eligibility analysis) should explain the following:

- First, the rejection should identify the judicial exception (i.e., abstract idea enumerated in Section I of the 2019 PEG, laws of nature, or a natural phenomenon) by referring to *what is recited* (i.e., set forth or described) in the claim and *explaining why* it is considered to be an exception (Step 2A Prong One). There is no requirement for the examiner to provide further support, such as publications or an affidavit or declaration under 37 CFR 1.104(d)(2), for the conclusion that a claim recites a judicial exception.⁸⁰
 - For abstract ideas, the rejection should explain why a specific limitation(s) recited in the claim falls within one of the enumerated groupings of abstract ideas (i.e., mathematical concepts, mental processes, or certain methods of organizing human activity) or provide a justification for why a specific limitation(s) recited in the claim is being treated as an abstract idea if it does not fall within the enumerated groupings of abstract ideas in accordance with the “tentative abstract idea” procedure in the 2019 PEG.
 - For a law of nature or a natural phenomenon, there has been no change in the type of explanation that should be provided in a rejection (i.e., the rejection should identify the law of nature or natural phenomenon as it is recited (i.e., set forth or described) in the claim and explain using a reasoned rationale why it is considered to be a law of nature or natural phenomenon).⁸¹
- Second, the rejection should *identify* any additional elements recited in the claim beyond the judicial exception and *evaluate* the integration of the judicial exception into a practical application *by explaining* that 1) there are no additional elements in the claim; or 2) the claim as a whole, looking at the additional elements individually and in combination, does not integrate the judicial exception into a practical application using the considerations set forth in the 2019 PEG (Step 2A Prong Two).
- Finally, the examiner should *explain why* the additional elements, taken individually and in combination, do not result in the claim, as a whole, amounting to significantly more than the exception (Step 2B).⁸² For instance, when the examiner has concluded that certain claim elements recite well-understood, routine, conventional activity in the relevant field, the examiner must expressly support such a rejection in writing with one of the four options specified in Section III.A. of the *Berkheimer* Memorandum.⁸³

If applicant challenges the examiner's findings, but the examiner deems it appropriate to maintain the rejection, the examiner must provide a rebuttal in the next Office action. For more information on evaluating applicant's response, see MPEP 2106.07(b). Applicant may timely submit evidence traversing a subject matter eligibility rejection according to the procedures set forth in MPEP 716.01 and 37 CFR 1.132.

V. Application Of The 2019 PEG In The Patent Examining Corps

Various suggestions were made as to the need for further guidance and examples (particularly in the area of life sciences) and more examiner training. The USPTO has already taken steps to enhance examiners' understanding of the revised eligibility guidance, and will continue to work

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with examiners as part of its ongoing efforts to enhance patent quality. The following discussion describes efforts that have been made so far to provide examiners with appropriate guidance and training on the application of the 2019 PEG. The following discussion also addresses concerns raised regarding applicants' options in responding to a subject matter eligibility rejection under the 2019 PEG.

Guidance Materials. The USPTO's current eligibility guidance includes: the 2019 PEG; the *Berkheimer* Memorandum; *Memorandum - Recent Subject Matter Eligibility Decisions: the Finjan Memorandum*;⁸⁴ MPEP Sections §§ 2103-2106;⁸⁵ *Subject Matter Eligibility Examples: Abstract Ideas* (Examples 37-42, issued January 7, 2019); and the examples contained in Appendix 1 to this update.⁸⁶ The examples are intended to illustrate the proper application of the eligibility analysis to a variety of claims in multiple technologies, and to guide examiners in evaluating eligibility in a consistent manner across the corps. The recently issued examples (i.e., examples 37-46) illustrate how to apply the 2019 PEG to analyze various fact patterns. Examples issued prior to the 2019 PEG do not apply the Step 2A Prong Two analysis in the 2019 PEG, however the ultimate results of eligibility or ineligibility for each example may still be relied upon because they have not changed. To assist examiners in understanding the principles discussed in the 2019 PEG and illustrated in the examples, Appendix 2 hereto is a comprehensive index of the examples, which provides an overview of the relevance of Examples 1-46 under the 2019 PEG. In particular, the index provides consolidated information on each example including the type of judicial exception involved, which examples provide a practical application or significantly more analysis, and the considerations that are evaluated in each example. For instance, the index explains that Example 3 (Digital Image Processing) contains a claim reciting a mathematical relationship that is eligible under the "improvements to the functioning of a computer or other technology" consideration. While published Example 3 indicates that this claim is eligible at Step 2B, the index explains that under the 2019 PEG, the same "improvements" consideration makes the claim eligible at Step 2A Prong Two.

Training. The examining corps was trained on the 2019 PEG in January – February 2019. Training was conducted in a variety of modalities, including instructor-led training and computer-based training. The training materials including slides are posted on the Office website. The computer-based training was designed to provide an introduction and overview of the 2019 PEG for examiners that do not regularly encounter subject matter eligibility issues. Examiners that regularly examine applications with subject matter eligibility issues received an advanced module led by an instructor that provided an in-depth discussion of the 2019 PEG and a subset of examples 37-42. The USPTO has continued to engage examiners regarding implementation of the 2019 PEG through art unit level Quality Enhancement Meetings. Presently, the USPTO is in the process of ascertaining what further training is appropriate.

Applicant Response. Concern was expressed regarding the fact that failure by USPTO personnel to follow the 2019 PEG is not, in itself, a proper basis for an appeal or a petition.⁸⁷ While the 2019 PEG does not constitute substantive rulemaking and does not have the force and effect of law, the 2019 PEG does constitute Office guidance and, accordingly, USPTO personnel are expected to follow it. As with any rejection, every applicant whose claims have been twice rejected, may appeal from the decision of the examiner to the Patent Trial and Appeal Board, and an applicant may rely upon the 2019 PEG in support of his or her argument that a rejection under § 101 is in error. It is the rejection under § 101, and not any alleged failure to comply with the 2019 PEG, that is reviewed by the Patent Trial and Appeal Board. Applicants also are encouraged to employ other courses of action available

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for engaging an examiner to obtain prompt resolution of any outstanding subject matter eligibility rejection or issues of compliance with the 2019 PEG (e.g., request an interview, contact the Supervisory Patent Examiner (SPE), pre-appeal brief review request).

¹ The current guidance documents on subject matter eligibility, including the 2019 PEG and the examples, all examiner training materials to date, and the public comments, are *available at* <https://www.uspto.gov/PatentEligibility>.

² Many responses appeared to be form letters from individuals that followed one of several formats.

³ 84 Fed. Reg. at 51.

⁴ The 2019 PEG supersedes MPEP 2106.04(II) (Eligibility Step 2A: Whether a Claim Is Directed to a Judicial Exception) to the extent it equates claims “reciting” a judicial exception with claims “directed to” a judicial exception. 84 Fed. Reg. at 51. However, the meaning of “recites”, which is “set forth or “describes” as explained in MPEP 2106.04(II), was not superseded by the 2019 PEG.

⁵ See *Genetic Techs. Ltd. v. Merial LLC*, 818 F.3d 1369, 1374-75, 1379 (Fed. Cir. 2016) (Claim to a method for analyzing DNA recited both the law of nature of linkage disequilibrium and the mental process of examining a non-coding region to detect an allele in the coding region).

⁶ If a claim recites a limitation(s) that falls under several exceptions (e.g., a law of nature or an abstract idea), it is sufficient for the examiner to identify that the claimed concept (the specific claim limitation(s) that the examiner believes may recite an exception) aligns with at least one judicial exception. See MPEP 2106.04.

⁷ See MPEP 2106.04(II).

⁸ 84 Fed. Reg. at 51-52.

⁹ 84 Fed. Reg. at 54.

¹⁰ 84 Fed. Reg. at 56-57.

¹¹ 437 U.S. 584, 585 (1978) ($B_1 = B_0 (1.0 - F) + PVL(F)$).

¹² See, e.g., *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1348-49 (Fed. Cir. 2017) (determining that the claims to a particular configuration of inertial sensors and a particular method of using the raw data from the sensors in order to more accurately calculate the position and orientation of an object on a moving platform did not merely recite “the abstract idea of using ‘mathematical equations for determining the relative position of a moving object to a moving reference frame’”).

¹³ See, e.g., Example 38 (Simulating an Analog Audio Mixer) and Example 39 (Method for Training a Neural Network for Facial Detection).

¹⁴ 450 U.S. 175, 177 n. 2, 179 n.5, 191-92 (1981) ($\ln v = CZ + x$).

¹⁵ 409 U.S. 63, 65 (1972) (describing the conversion between binary-coded decimal and pure binary numerals as a “mathematical problem[] of converting one form of numerical representation to another.”).

¹⁶ 306 U.S. 86, 91 (1939). In *Mackay Radio*, while the litigated claims 15 and 16 of U.S. Patent No. 1,974,387 expressed this mathematical relationship using a formula that described the angle between the conductors ($50.9(l/\lambda - 0.513 >)$), other claims in the patent (e.g., claim 1) expressed the mathematical relationship in other ways. See also *Digitech Image Techs., LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014). In *Digitech*, the claims at issue, namely claims 10-15, recited generating first and second data by taking existing information, manipulating the data using mathematical formulas, and organizing this information into a new form. The court explained that such claims describe a process of organizing information and manipulating information through mathematical correlations, which is considered to be a mathematical relationship.

¹⁷ See note 14, *supra*.

¹⁸ See note 11, *supra*.

¹⁹ 561 U.S. 593, 599 (2010) (Fixed Bill Price = $F_i + [(C_i + T_i + LD_i) \times (\alpha + \beta E(W_i))]$). See also MPEP 2106.04(a)(2)(IV)(A) for additional examples of mathematical equations or formulas.

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²⁰ 898 F.3d 1161, 1163-65 (Fed. Cir. 2018), *modifying SAP Am., Inc. v. InvestPic, LLC*, 890 F.3d 1016 (Fed. Cir. 2018). The court in *SAP* characterized the claims as being directed to the abstract idea of “selecting certain information, analyzing it using mathematical techniques, and reporting or displaying the results of the analysis.” 898 F.3d at 1167. While there is no enumerated grouping that encompasses data analysis and display *per se* in the 2019 PEG, claims containing this type of limitation may still recite an abstract idea under the 2019 PEG. For example, the claims in *SAP* may be considered to fall within the mathematical concepts grouping or the certain methods of organizing human activity grouping. *Id.* at 1163 & 1168 (citation omitted) (describing the claims as “a series of mathematical calculations based on selected information and the presentation of the results of those calculations in the plot of a probability distribution function” or having information of an “‘investment’ character” that “simply invokes a separate category of abstract ideas involved in *Alice* and many of our cases – ‘the creation and manipulation of legal obligations such as contracts, involved in fundamental economic practices’”).

²¹ See note 11, *supra*.

²² 741 F. App’x 777, 780 (Fed. Cir. 2018) (non-precedential). See also MPEP 2106.04(a)(2)(IV)(B) for additional examples of mathematical calculations.

²³ *In re Marco Guldenaar Holding B.V.*, 911 F.3d 1157, 1160-61 (Fed. Cir. 2018).

²⁴ See, e.g., *In re Smith*, 815 F.3d 816, 818-19 (Fed. Cir. 2016) (describing a new set of rules for conducting a wagering game as a “fundamental economic practice”); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1364 (Fed. Cir. 2015) (a new method of price optimization was found to be a fundamental economic concept); *In re Greenstein*, 774 F. App’x 661, 664 (Fed. Cir. 2019) (non-precedential) (claims to a new method of allocating returns to different investors in an investment fund was a fundamental economic concept).

²⁵ See, e.g., *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 219-20 (2014) (describing the concept of intermediated settlement, like the risk hedging in *Bilski*, to be a “fundamental economic practice long prevalent in our system of commerce” and also as “a building block of the modern economy”) (citation omitted); *Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (claims to the concept of hedging are a “fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class.”) (citation omitted); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1313 (2016) (“The category of abstract ideas embraces ‘fundamental economic practice[s] long prevalent in our system of commerce,’ ... including ‘longstanding commercial practice[s]’”).

²⁶ 876 F.3d 1372, 1378-79 (Fed. Cir. 2017).

²⁷ 873 F.3d 905, 911 (Fed. Cir. 2017). The court in *Secured Mail* characterized the claims as being directed to the abstract idea of “using a marking affixed to the outside of a mail object to communicate information about the mail object.” 873 F.3d at 911. While there is no enumerated grouping that encompasses tracking or organizing information *per se* in the 2019 PEG, claims containing this type of limitation may still recite an abstract idea under the 2019 PEG. For example, the claims in *Secured Mail* are considered to fall within the certain methods of organizing human activity grouping as a fundamental economic practice.

²⁸ 921 F.3d 1084, 1092 (Fed. Cir. 2019).

²⁹ 765 F.3d 1350, 1355 (Fed. Cir. 2014).

³⁰ 728 F.3d 1336, 1338-39 (Fed. Cir. 2013).

³¹ 671 F.3d 1317, 1322 (Fed. Cir. 2012).

³² 554 F.3d 967, 981 (Fed. Cir. 2009).

³³ 772 F.3d 709, 714-15 (Fed. Cir. 2014).

³⁴ 788 F.3d 1359, 1362-63 (Fed. Cir. 2015).

³⁵ 558 F.3d 1359, 1361 (Fed. Cir. 2009).

³⁶ 859 F.3d 1044, 1054 (Fed. Cir. 2017).

³⁷ 674 F.3d 1315, 1331 (Fed. Cir. 2012).

³⁸ 911 F.3d 1157, 1161 (Fed. Cir. 2018).

³⁹ 887 F.3d 1376 (Fed. Cir. 2018).

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⁴⁰ 645 F. App'x 1014, 1015-16 (Fed. Cir. 2016) (non-precedential).

⁴¹ 561 U.S. 593, 595 (2010).

⁴² See, e.g., 84 Fed. Reg. 52 n. 14, which cited the following cases in which the courts identified product claims as reciting “mental process”-type abstract ideas: *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307 (Fed. Cir. 2016) (product claim to “post office”); *Mortgage Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314 (Fed. Cir. 2016) (product claim to a computer system); *Versata Dev. Grp. v. SAP Am., Inc.*, 793 F.3d 1306 (Fed. Cir. 2015) (product claims to computer systems and computer-readable media); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011) (product claim to computer-readable medium).

⁴³ See 84 Fed. Reg. at 52 n.14. See also *SRI Int'l, Inc. v. Cisco Sys., Inc.*, 930 F.3d 1295, 1304 (Fed. Cir. 2019); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375, 1376 (Fed. Cir. 2011) (explaining that the claims in *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010), and *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319 (Fed. Cir. 2010), are directed to inventions that “could not, as a practical matter, be performed entirely in a human’s mind”).

⁴⁴ 601 F.3d 1319, 1331-33 (Fed. Cir. 2010).

⁴⁵ 930 F.3d 1295, 1304 (Fed. Cir. 2019).

⁴⁶ 839 F.3d 1138, 1148 (Fed. Cir. 2016) (distinguishing *TQP Development, LLC v. Intuit Inc.*, 2014 WL 651935 (E.D. Tex. Feb. 19, 2014)).

⁴⁷ 627 F.3d 859, 868 (Fed. Cir. 2010).

⁴⁸ 830 F.3d 1350, 1356 (Fed. Cir. 2016).

⁴⁹ 774 F.3d 755, 763 (Fed. Cir. 2014).

⁵⁰ 659 F.3d 1057, 1067 (Fed. Cir. 2011).

⁵¹ 645 F. App'x 1014, 1016-17 (Fed. Cir. 2016) (non-precedential).

⁵² The Supreme Court recognized this in *Gottschalk v. Benson*, 409 U.S. 63 (1972), determining that a mathematical algorithm for converting binary coded decimal to pure binary within a computer’s shift register was patent ineligible subject matter. The court concluded that the algorithm could be performed purely mentally even though the claimed procedures “can be carried out in existing computers long in use, no new machinery being necessary.” *Id* at 67.

⁵³ See 84 Fed. Reg. at 52 n. 14.

⁵⁴ 887 F.3d 1376, 1385 (Fed. Cir. 2018). See also, e.g., *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1316-18 (Fed. Cir. 2016) (relying upon the specification, the Federal Circuit explained that the claimed electronic post office, which recited limitations describing how the system would receive, screen and distribute e-mail on a computer network, was analogous to how a person decides whether to read or dispose of a particular piece of mail and that “with the exception of generic computer-implemented steps, there is nothing in the claims themselves that foreclose them from being performed by a human, mentally or with pen and paper”).

⁵⁵ See, e.g., *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1356 (Fed. Cir. 2016); *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1095 (Fed. Cir. 2016); *Mortgage Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1318, 1324 (Fed. Cir. 2016); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1314-15 (Fed. Cir. 2016); *Versata Dev. Group Inc. v. SAP America, Inc.*, 793 F.3d 1306 (Fed. Cir. 2015); *Content Extraction and Transmission LLC v. Wells Fargo Bank*, 776 F.3d 1343, 1345, 1347 (Fed. Cir. 2014).

⁵⁶ 811 F.3d 1314, 1318, 1324 (Fed. Cir. 2016).

⁵⁷ See *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372-73 (Fed. Cir. 2011).

⁵⁸ The use of pen and paper to help perform a mental step simply accounts for variations in memory capacity from one person to another and should not be used to expand the scope of the mental processes grouping.

⁵⁹ 654 F.3d 1366, 1372-73 (Fed. Cir. 2011). See also *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016) (citing *TQP Development, LLC v. Intuit Inc.*, 2014 WL 651935 (E.D. Tex. Feb. 19, 2014)) (the specific data encryption method “could not conceivably be performed in the human mind or with pencil and paper”).

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⁶⁰ *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372, 1375-76 (Fed. Cir. 2011) (distinguishing *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010), and *SiRF Tech., Inc. v. Int'l Trade Comm'n*, 601 F.3d 1319 (Fed. Cir. 2010)).

⁶¹ See MPEP 713.

⁶² 84 Fed. Reg. at 53.

⁶³ 84 Fed. Reg. at 54.

⁶⁴ 84 Fed. Reg. at 53.

⁶⁵ See MPEP 2106.05(b), 2106.05(c), and 2106.05(f).

⁶⁶ 930 F.3d 1295, 1303 (Fed. Cir. 2019).

⁶⁷ 573 U.S. 208, 226 (2014).

⁶⁸ 827 F.3d 1341, 1348 (Fed. Cir. 2016).

⁶⁹ 827 F.3d 1341, 1350 (Fed. Cir. 2016).

⁷⁰ See MPEP 2106.05(a).

⁷¹ 827 F.3d 1042, 1048 (Fed. Cir. 2016).

⁷² 921 F.3d 1084, 1093-94 (Fed. Cir. 2019).

⁷³ See MPEP 2106.05(a)(II) (discussing *Diamond v. Diehr*, 450 U.S. 175, 187 and 191-92 (1981)) and the *Finjan* Memorandum, discussing *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1303-04 (Fed. Cir. 2018). The *Finjan* Memorandum of April 2, 2018 is entitled "Recent Subject Matter Eligibility Decisions", and is available at <https://www.uspto.gov/sites/default/files/documents/memo-recent-sme-ctdec-20180402.PDF>.

⁷⁴ See, e.g., MPEP 716.09 on 37 C.F.R. § 1.132 practice with respect to rejections under 35 U.S.C. § 112(a).

⁷⁵ USPTO Memorandum of June 7, 2018, "Recent Subject Matter Eligibility Decision: *Vanda Pharmaceuticals Inc. v. West-Ward Pharmaceuticals*," available at <https://www.uspto.gov/sites/default/files/documents/memo-vanda-20180607.PDF>.

⁷⁶ 659 F.3d 1057, 1066-67 (Fed. Cir. 2011).

⁷⁷ 35 U.S.C. § 132(a).

⁷⁸ As discussed in MPEP 2106.07, claims should not be grouped together in a common rejection unless that rejection is equally applicable to all claims in the group.

⁷⁹ There has been no change in "Step 1" rejections based on a failure to claim an invention that falls within the statutory categories of invention (i.e., the claim is not to a process, machine, manufacture, or composition of matter and is thus rejected at Step 1 of the eligibility analysis). See MPEP 706.03(a) for information on making this type of rejection.

⁸⁰ See MPEP 2106.07(a)(III).

⁸¹ See MPEP 2106.07(a).

⁸² Explanation of Step 2B in a rejection written after the 2019 PEG will likely be shorter than in the past because many of the considerations evaluated in revised Step 2A overlap with Step 2B and thus, are not reevaluated in Step 2B. The exception is when an examiner had concluded, in Step 2A Prong Two, that an additional element was insignificant extra-resolution activity, in which case the examiner should re-evaluate, in Step 2B, whether the element is unconventional (i.e., more than what is well-understood, routine, conventional activity) in the field.

⁸³ USPTO Memorandum of April 19, 2018, "Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*)", available at <https://www.uspto.gov/sites/default/files/documents/memo-berkheimer-20180419.PDF>. If the examiner relies on the finding of well-understood, routine, conventional activity to support a determination that a limitation(s) is extra-resolution activity, the examiner needs to comply with the *Berkheimer* Memorandum. 84 Fed. Reg. at 56.

⁸⁴ USPTO Memorandum of April 2, 2018, "Recent Subject Matter Eligibility Decisions", available at <https://www.uspto.gov/sites/default/files/documents/memo-recent-sme-ctdec-20180402.PDF>.

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⁸⁵ The 2019 PEG supersedes MPEP section 2106.04(II) (Eligibility Step 2A: Whether a Claim Is Directed to a Judicial Exception) to the extent the MPEP equates claims “reciting” a judicial exception with claims “directed to” a judicial exception. The USPTO has provided a chart that discusses the sections of the MPEP that are affected by the 2019 PEG. In addition, the *Berkheimer* Memorandum revised the procedures set forth in MPEP § 2106.07(a) (Formulating a Rejection For Lack of Subject Matter Eligibility) and MPEP § 2106.07(b) (Evaluating Applicant's Response).

⁸⁶ The 2019 PEG supersedes the *Vanda* Memorandum (*See* note 75, *supra*). The guidance in the *Vanda* Memorandum has been incorporated into the 2019 PEG.

⁸⁷ 84 Fed. Reg. at 51.