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# Alert | Patents and Innovation Strategies/ Innovation & Artificial Intelligence

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## USPTO Issues New Guidance on Patent Subject Matter Eligibility for AI Inventions

In response to the rapid advancements in artificial intelligence (AI) and the evolving landscape of patent law, the United States Patent and Trademark Office (USPTO) has issued a comprehensive guidance update on patent subject matter eligibility, particularly focusing on AI inventions. This update, aligned with Executive Order 14110 on the "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," aims to provide clarity and consistency in evaluating the subject matter eligibility of AI-related patent claims.

### Background and Context

Recognizing the transformative potential of AI, President Biden's Executive Order 14110 emphasizes the need for responsible AI innovation to address societal challenges while fostering economic growth and security. The Executive Order mandates the USPTO to issue updated guidance on patent eligibility to address the unique considerations at the intersection of AI and intellectual property (IP).

The USPTO's latest guidance update, effective from its publication date in the Federal Register, is designed to assist patent examiners and stakeholders in evaluating AI-related patent claims. The update is said to incorporate feedback from stakeholders and recent Federal Circuit decisions.

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## PART ONE: Key Components of the Guidance Update

### 1. Overview of Existing Patent Subject Matter Eligibility Guidance

The USPTO's subject matter eligibility guidance, found in the Manual of Patent Examining Procedure (MPEP) sections 2103-2106.07(c), applies to all technologies, including AI inventions. The guidance combines the criteria for eligibility into a single analysis, addressing whether a claimed invention falls into one of the four statutory categories (processes, machines, manufactures, and compositions of matter) and whether it is directed to a judicial exception (abstract ideas, laws of nature, or natural phenomena).

### 2. Evaluation of AI Inventions

The guidance update provides specific instructions for evaluating AI inventions, focusing on two critical areas of the now well-known Alice/Mayo test:

- Step 2A, Prong One: Determining whether a claim recites an abstract idea.
- Step 2A, Prong Two: Evaluating whether the claim integrates the judicial exception into a practical application.

### 3. Abstract Ideas and AI Inventions

AI inventions can involve abstract ideas, such as mathematical concepts, certain methods of organizing human activity, and mental processes. The guidance emphasizes the importance of distinguishing between claims that merely involve an abstract idea (which should be per se eligible) and those that recite an abstract idea, requiring further eligibility analysis.

The update provides additional eligibility examples, discussed in Part Two below, to illustrate claims that do and do not recite an abstract idea. For instance, claims to a specific hardware-based RFID serial number data structure or a system for monitoring health and activity in livestock are not considered abstract ideas.

### 4. Practical Application and Improvements

A key consideration in determining subject matter eligibility is whether the claim integrates the judicial exception into a practical application. This can be demonstrated by showing that the claimed invention improves the functioning of a computer or another technology or technical field.

The guidance highlights the importance of claims that provide a particular solution to a problem or a specific way to achieve a desired outcome, rather than merely claiming the idea of a solution. For example, claims to a rule-based system for animating lip synchronization and facial expressions in three-dimensional characters were found to improve existing technological processes and were thus eligible.

### 5. AI-Assisted Inventions

The guidance clarifies that the method of invention creation, including the use of AI, is not a consideration in the subject matter eligibility analysis. However, the USPTO's recent guidance on inventorship for AI-assisted inventions explains that current statutes do not recognize contributions by AI systems for inventorship purposes. Patent protection may still be sought for AI-assisted inventions where one or more persons made a significant contribution to the claimed invention.

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### 6. Considerations for Legal Practitioners

a. Understand the Judicial Exceptions: Familiarize yourself with the judicial exceptions (abstract ideas, laws of nature, and natural phenomena) and the specific groupings of abstract ideas (mathematical concepts, certain methods of organizing human activity, and mental processes). This understanding is crucial for drafting claims that avoid reciting a judicial exception.

b. Focus on Practical Applications: When drafting claims for AI inventions, emphasize how the invention integrates the judicial exception into a practical application. Highlight specific improvements to the functioning of a computer or another technology or technical field.

c. Leverage Examples: Utilize the new examples provided in the USPTO guidance and discussed below to frame your claims. For instance, claims that describe a specific application of AI to a particular technological field or a specific way to achieve a desired outcome are more likely to be considered eligible.

d. Document Technological Improvements in the Patent's Specification: Ensure that the specification clearly describes how the claimed invention improves existing technological processes. This documentation can be critical in demonstrating that the claim is not merely an abstract idea but a practical application that enhances technology.

e. Stay Updated on Case Law: Keep abreast of recent Federal Circuit decisions related to AI and patent eligibility. These cases provide valuable insights into how the courts interpret and apply the subject matter eligibility criteria.

f. Consider Inventorship Issues: For AI-assisted inventions, ensure that the contributions of human inventors are clearly documented. While AI systems can assist in the invention process, the current legal framework requires that inventorship be attributed to natural persons.

## PART TWO: The New Examples

The USPTO guidance introduces three new examples (numbered 47 to 49) to illustrate the application of its eligibility analysis to AI-related claims. The new guidance, as with previous guidance, focuses on the claim language and appears to ignore whether AI was used in developing the claimed invention.

### 1. Example 47: Artificial Neural Network for Anomaly Detection

This example illustrates the application of the eligibility analysis to claims that recite limitations specific to AI, particularly the use of an artificial neural network to identify or detect anomalies. The example presents three claims:

Claim 1 is directed to an application-specific integrated circuit (ASIC) for an artificial neural network. The claim describes the physical structure of the ASIC, including a plurality of neurons organized in an array and synaptic circuits connecting the neurons. This claim is found to be eligible at Step 1 as it falls within the statutory category of a machine. At Step 2A Prong One, the claim is determined not to recite a judicial exception because it is directed to a physical device with specific hardware components rather than an abstract idea.

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Claim 2 is a method claim for discretizing continuous training data via an artificial neural network (ANN) to generate input data. The method involves receiving training data, processing it through the neural network, and detecting and outputting anomalies. This claim is analyzed through all steps of the eligibility analysis. At Step 2A Prong One, it is found to recite a mental process (the comparison step). However, at Step 2A Prong Two, the claim is found to integrate the abstract idea into a practical application by applying the judicial exception in conjunction with a particular machine (the artificial neural network) to detect network intrusions in a way that is more than a mere instruction to apply the exception using a generic computer component.

Claim 3 is similar to Claim 2 but adds more specific details about the structure and training of the ANN. This claim is found to be eligible at Step 2A Prong Two because it integrates the abstract idea into a practical application. The claim recites a specific manner of training and using a neural network to detect network intrusions, which reflects an improvement in the functioning of a computer or an improvement to other technology or technical field.

This example illustrates how AI-related claims can be eligible when they involve specific hardware implementations or when they apply abstract ideas using particular machines or techniques that improve computer functionality or other technology.

**2. Example 48: AI-Based Speech Signal Processing**

This example demonstrates the analysis of claims that recite AI-based methods of analyzing speech signals and separating desired speech from extraneous or background speech.

Claim 1 is a method for processing speech signals using a trained machine learning model. The method involves receiving a speech signal, extracting features, applying a trained machine learning model to separate the speech signal into components, and outputting a desired speech component. This claim is analyzed through all steps of the eligibility analysis. At Step 2A Prong One, it is found to recite a mental process (the separation of speech components). At Step 2A Prong Two, the claim is found not to integrate the abstract idea into a practical application because the use of a generic machine learning model to perform the abstract idea amounts to mere instructions to apply an exception using a generic computer component. Thus, the claim is ineligible.

Claim 2 builds upon Claim 1 by adding specific details about the structure and training of the machine learning model, including the use of a particular neural network architecture and training technique. This claim is found to be eligible at Step 2A Prong Two because it integrates the abstract idea into a practical application. The claim recites a specific manner of training and using a neural network to process speech signals, reflecting an improvement in speech signal processing technology.

Claim 3 is similar to Claim 2 but focuses on the use of the trained model rather than its training process. This claim is also found to be eligible at Step 2A Prong Two because it integrates the abstract idea into a practical application. The claim recites a specific implementation of the trained model that improves the technology of speech signal processing.

This example illustrates how adding specific technical details about the structure, training, or implementation of AI models can transform an otherwise ineligible claim into an eligible one by demonstrating a practical application that improves technology.

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### 3. Example 49: AI-Assisted Personalized Medical Treatment

This last example illustrates the analysis of method claims reciting an AI model designed to assist in personalizing medical treatment based on the individual characteristics of a particular patient.

Claim 1 is a method for generating and administering a treatment plan using a trained machine learning model. The method involves receiving patient data, processing it through the model, and generating and administering a treatment plan based on the model's output. This claim is analyzed through all steps of the eligibility analysis. At Step 2A Prong One, it is found to recite a mental process (generating a treatment plan). At Step 2A Prong Two, the claim is found *not to* integrate the abstract idea into a practical application because the use of a generic machine learning model amounts to mere instructions to apply an exception using a generic computer component.

Claim 2 builds upon Claim 1 by adding details about the treatment involving a specific compound. This claim is found to be eligible at Step 2A Prong Two because it integrates the abstract idea into a practical application.

This example demonstrates how AI-assisted medical treatment methods can be eligible when they involve specific technical implementations of AI models in practical applications that have "meaningful limits" (e.g., the particular treatment via Claim 2's recited compound).

These examples collectively illustrate how the USPTO is approaching the eligibility analysis of AI-related inventions. They emphasize that while certain applications of AI may not be eligible, claims that demonstrate specific technical improvements or practical applications of AI technology can meet the eligibility requirements under 35 U.S.C. 101. As with prior guidance, practitioners will have to navigate these new examples when prosecuting their clients' AI related inventions.

### Conclusion

By understanding the key components of this guidance and applying the practical considerations outlined above, legal practitioners can better navigate the complexities of patenting AI inventions. As AI continues to evolve and reshape various industries, staying informed and proactive in addressing patent eligibility issues will be essential for protecting and promoting innovation. While this latest guidance update aims to provide much-needed clarity and direction for patent examiners and stakeholders, it remains to be seen whether that aim will be reached.

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