Statement of Objectives
United States Patent and Trademark Office (USPTO)
AUTOMATED SOLUTIONS (INCLUDING ARTIFICIAL INTELLIGENCE) for USPTO

1 Description and Purpose

Performing a complete prior art search is a critically important component of the patent examination process and the mission of the U.S. Patent and Trademark Office (USPTO) to issue reliable patent rights. A prior art search that retrieves all potentially relevant prior art references provides confidence to the patent holder and the public that the likelihood that undiscovered relevant prior art will later emerge is de minimis. However, the exponential growth of prior art and tremendous pace of technological innovation make it increasingly more difficult to quickly discover the most relevant prior art.

Patent Product Line. The USPTO's IT Product Catalog has four (4) product lines: Patent Product Line, Trademark Product Line, Enterprise Business Product Line, and Enterprise Infrastructure Product Line. Each product is comprised of both legacy systems that the USPTO is stabilizing, maintaining and operating, and modern solutions that are being planned, in progress, or in production.

The Patent Product Line encompasses products and product components that deliver and collect business value. Internal and external stakeholders access the product line to manage the Patent application process through the entire Patent lifecycle, including filing, examination, appeals, search, international data exchange, fees, maintenance, and reporting.

Artificial Intelligence (AI) is a transformative technology that holds promise for tremendous societal and economic benefit. AI research and implementation can advance national priorities in intellectual property by contributing to ensuring strong, predictable, and consistent intellectual property (IP) rights. As part of the efforts to strengthen search capabilities, the USPTO has been developing and implementing advanced information technology systems and AI to enhance the suite of tools available to patent examiners and the public. The USPTO has AI-based patent search capabilities along with a roadmap for future development but recognizes that integrating more advanced technology solutions offers unique opportunities to leapfrog forward to further enhance patent search capabilities and further strengthen the patent system.

AI enables computers and other automated systems to perform tasks that have historically required human cognition and what we typically consider human decision-making abilities. According to Section 238(g) of the FY2019 National Defense Authorization Act, the term ''artificial intelligence'' includes the following:

> (1) Any artificial system that performs tasks under varying and unpredictable circumstances without significant human oversight, or that can learn from experience and improve performance when exposed to data sets. (2) An artificial system developed in computer software, physical hardware, or other context that

solves tasks requiring human-like perception, cognition, planning, learning, communication, or physical action. (3) An artificial system designed to think or act like a human, including cognitive architectures and neural networks. (4) A set of techniques, including machine learning, that is designed to approximate a cognitive task. (5) An artificial system designed to act rationally, including an intelligent software agent or embodied robot that achieves goals using perception, planning, reasoning, learning, communicating, decision making, and acting.

The USPTO has embraced this expansive view of the definition for artificial intelligence to be leveraged for improving agency operations, employee effectiveness, service to the public, and enhance accessibility to intellectual property system. Herein the term "artificial intelligence" includes the development and implementation of models and capabilities that leverage approaches such as, but not limited to, machine learning (both supervised and unsupervised), neural networks, computer vision, natural language processing, large language models, deep learning, advanced analytics utilizing "Big Data", blockchain, and analogous data science and information retrieval approaches. Additionally, the USPTO considers artificial intelligence to necessarily include the development and implementation of feedback systems and controls in order to continuously improve models.

The purpose of the Automated Solutions for USPTO RFI is to attain additional, low or no cost, AI-based tools that can be leveraged to assist in the completion of specific patent examining related tasks thereby ensuring consistency of the patent work product.

2 Operating Presumptions and Constraints

Table 1 identifies the operating assumptions and constraints.

Table 1: Operating Constraints

Constraints
1) The USPTO intends to maintain sole rights to all proprietary data, models, simulations, technologies, data rights (to include search criteria), and/or any other related intellectual property developed or accessed related to, or resulting from, this RFI.
2) Integrate directly with existing web-based examiner search tools at USPTO.
3) Be capable of leveraging a cloud provider's DBaaS and block storage for data persistence.
4) Leverage Okta using the OIDC pattern for authentication and authorization.
5) Leverage existing enterprise tools at USPTO for managing code, securing applications, and building and packaging artifacts, including GitLab, SonarQube, and Nexus.
6) The solution must be section 508 compliant.

7)	The solution must adhere to application, development, enterprise architecture, and security standards including but not limited to NIST 800-53 as defined by the USPTO OCIO.
8)	Any internal AI tool enhancements shall not be directly accessible from the internet.
9)	The solution must not require direct access to the internet.
10)	The models will need to interact with confidential patent data under 35 U.S.C. 122 and should meet all necessary security requirements to protect such data.
11)	Contractor shall communicate and collaborate with the Lead Product Owner (LPO), Technical Lead, and other stakeholders in order to build, secure, test, deploy, release, and maintain the solution
12)	The target solution shall be capable of operating at a minimum, seven (7) days a week, and 365 days per year basis
13)	The target solution shall be compliant with all relevant security controls outlined in the FIPS, **NIST** and the Federal Information Security Management Act (FISMA) that enables the USPTO to perform activities defined by the DOC Risk Management Framework to obtain an ATO.

4 Scope

USPTO is seeking AI based tools to increase the overall efficiency of the patent examination process, AI based tools could be leveraged to assist in the completion of specific patent examining related tasks thereby ensuring consistency of the patent work product.

The scope of this requirement entails providing AI tools to aid in the completion of a comprehensive search report delineating analysis between the prior art found and the claim(s) in the application. Utilizing ML and AI to perform a comprehensive search based on the claimed invention in light of the disclosure in the specification.

5 Objectives

5.1 Completion of a comprehensive search report delineating analysis between the prior art found and the claim(s) in the application. Utilizing ML and AI to perform a comprehensive search based on the claimed invention in light of the disclosure in the specification.

a. Determine the type of application being filed – Utility, Plant, Design
    i. Utility
        1. Search results will be based upon the claimed invention, covering the appropriate areas of search as set forth in the Manual of Patent Examining Procedure (MPEP 904.02). The search should be flexible and adaptable enough to account for the same concept to be disclosed using varying terms. For example, silica being considered the same as silicon dioxide or SiO_2. Appropriate areas of search to include at least:

a. Domestic patents
b. Foreign patents
c. Non-Patent literature (NPL)

2. Compare the search results against the claims, taking into account claim dependency, to determine the relevance of the prior art to the claimed invention.
3. Provide notations of where claim elements are found in the prior art. The notations should capture pertinent data such as column and line, page and line, or page and section.
4. Provide citations of relevant prior art being applicable to novelty and non-obviousness (35 USC 102 or 103). Ensure each claim, where applicable, is associated with each piece of relevant prior art which is designated as going to novelty and/or non-obviousness.
    a. Domestic Patent – Document number to include country code-number-kind code, date, inventor, classification
    b. Foreign Patent - Document number to include country code-number-kind code, date, country, inventor, classification
    c. Non-Patent Literature – Author, title, date, publisher, edition or volume, pertinent pages
5. Generate a final report listing the claims with the relevant prior art mapped thereto, wherein the report lists the relevant citations as indicated in section 4 above. The final report could mirror PCT Chapter 1 search reports, PCT Chapter II, a USPTO Office Action in the application of novelty or non-obviousness using relevant USPTO form paragraphs or any other format that clearly conveys the detailed analysis.

ii. Plant

1. Search results will be based upon the disclosure and claimed invention, covering the appropriate areas of search as set forth in the manual of patent examining procedure (MPEP 904.02). The search should be flexible and adaptable enough to account for the same concept to be disclosed using varying terms. Appropriate areas of search to include at least:
    a. Domestic patents
    b. Foreign patents
    c. Non-Patent literature (NPL)
    d. Report of Agricultural Research Service (if applicable)
2. Compare the search results against the disclosure and the claim to determine the relevance of the prior art to the claimed invention.
3. Provide notations of where claim elements are found in the prior art. The notations should capture pertinent data such as column and line, page and line, or page and section.

4. Provide citations of relevant prior art being applicable to novelty and non-obviousness (35 USC 102 or 103).
    a. Domestic Patent – Document number to include country code-number-kind code, date, inventor, classification
    b. Foreign Patent - Document number to include country code-number-kind code, date, country, inventor, classification
    c. Non-Patent Literature – Author, title, date, publisher, edition or volume, pertinent pages
5. Generate a report listing the claims with the relevant prior art mapped thereto, wherein the report lists the relevant citations as indicated in section 4 above. The final report could mirror PCT Chapter 1 search reports, PCT Chapter II, a USPTO Office Action in the application of novelty or non-obviousness using relevant USPTO form paragraphs or any other format that clearly conveys the detailed analysis.

iii. Design

1. Search results will be based upon the ornamental shape or configuration of the article in which the design is embodied or the surface ornamentation which it is applied to or embodied in the design. A search to determine novelty and non-obviousness of a claimed design must generally be determined by the following areas:
    a. Pertinent Design class
    b. Mechanical class encompassing inventions of the same general type
    c. Catalogs and trade journals
    d. Available foreign patent databases
2. Compare the search results against the claimed design to determine the relevance of the prior art to claimed invention.
3. Provide notations of where the claimed design is found in the relevant prior art. The notations should capture pertinent data such as column and line, page and line, or page and section.
4. Provide citations of relevant prior art being applicable to novelty and non-obviousness (35 USC 102 or 103).
    a. Domestic Patent – Document number to include country code-number-kind code, date, inventor, classification
    b. Foreign Patent - Document number to include country code-number-kind code, date, country, inventor, classification
    c. Non-Patent Literature – Author, title, date, publisher, edition or volume, pertinent pages

5. Generate a report listing the claims with the relevant prior art mapped thereto, wherein the report lists the relevant citations as indicated in section 4 above. The final report could mirror PCT Chapter 1 search reports, PCT Chapter II, a USPTO Office Action in the application of novelty or non-obviousness using relevant USPTO form paragraphs or any other format that clearly conveys the detailed analysis.

5.2 Future Enhancements: These are enhancements beyond what would be provided in #1, above, that could be done in the future.

a. AI utilized to provide a detailed analysis of a US or 371 National Stage Patent Application to draft office actions to properly determine formality objections or rejections:
   i. Formality Objections
      6. Abstract,
      7. Specification,
      8. Claims, and
      9. Figures;
   i. Formality Rejection
      10. 35 USC 112 analysis of the claims
      11. 35 USC 101 analysis of:
         a. Subject Matter Eligibility
         b. Double Patenting
b. AI utilized to provide templates/forms/analysis of a U.S. or 371 National Stage Patent Application based on input from a Patent Examiner to create a complete office action.
   i. Examiner input could include:
      1. 35 USC 112 analysis
         a. 112(a) – written description
         b. 112(b) – indefiniteness
         c. 112(d) – reference in dependent form
         d. 112(e) – reference in multiple dependent form
         e. 112(f) – means plus function
      2. 35 USC 101 analysis
         a. Subject Matter Eligibility
         b. Double Patenting
      3. Brief description of relevant prior art under 35 USC 102 and/or 103
      4. Other relevant brief descriptions such as allowable subject matter