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REPORT OF THE SHARING SESSION ON THE USE OF ARTIFICIAL INTELLIGENCE (AI) FOR EXAMINATION OF PATENT APPLICATIONS

Document prepared by the Secretariat

INTRODUCTION

1.   Pursuant to the decision of the Standing Committee on the Law of Patents (SCP) at its thirty-third session, held in Geneva from December 6 to 9, 2021, the present document contains a report of the sharing session, held on December 7, 2021, on the use of artificial intelligence (AI) for examination of patent applications.[1]

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[1]   Presentations made during the sharing session are available at: https://www.wipo.int/meetings/en/details.jsp?meeting_id=66868. Webcasting and automatically generated WIPO Speech-to-Text transcripts of the sharing session are available at: https://webcast.wipo.int/ and https://www.wipo.int/s2t/SCP33/SCP_33_2021-12-07_PM_1_en_mp4_en.html, respectively.

REPORT OF THE SHARING SESSION ON THE USE OF AI FOR EXAMINATION OF PATENT APPLICATIONS

Presentations

Delegation of Japan

2.   Advancement in the complexity of cutting-edge technologies as well as expansion of the scope of prior art due to the growing number of patent applications filed worldwide have necessitated utilization of AI in the business operations of the Japan Patent Office (JPO). Under these circumstances, technologies such as machine learning, natural language processing and deep learning are anticipated to be used in JPO's business operations. The ultimate goal of using such AI technologies is to conduct higher quality and more efficient business operations, and as a result, to improve its services provided to the users.

3.   The use of AI technologies by the JPO has been guided by its Action Plan since FY 2017. The Action Plan was revised in 2021, based on the results of a review conducted in 2020.

4.   In accordance with the Action Plan, the JPO has identified the following projects for using AI in patent examination: (i) assigning FIs (File Index) and F-terms (File forming terms), which are JPO-specific search indexes, to foreign patent documents using machine learning in order to enable JPO examiners to conduct collective searches on both Japanese and foreign documents with these search indexes; (ii) creating a system that suggests relevant patent classifications and keywords based on the knowledge of experienced examiners in order to assist new examiners in conducting effective prior art searches; (iii) patent image searches; and (iv) rankings of prior art patent documents in accordance with their relevance to the claimed invention under examination.

Delegation of France

5.   The National Institute of Industrial Property (INPI) explores the progress made in the AI technologies and is developing AI-based tools for efficient classification of patent applications.

6.   Receiving approximately 300 patent applications per week, the task of manual pre-classification of applications is very cumbersome in terms of the length of time required, and is prone to errors. Thus, INPI developed an AI tool using data collection, natural language processing and supervised learning, which would help to pre-classify patent applications. As regards the performance of this tool since 2019, it reached around 80 per cent of accuracy (similar to the human dispatching accuracy). The tool contributed to a time savings of 10 hours per week in pre-classifying patent applications.

7.   One of the main challenges of patent classification is the multi-level classification system with one primary code and several secondary codes assigned for each patent. This can amount to more than 60,000 subgroups under the International Patent Classification (IPC). Thus, there is a need for a sophisticated model for the automation of patent classification, for which INPI focused on the Extreme Multi-label Text Classification (XMTC) to come up with a model for classifying patent applications. Further, INPI conducted, in collaboration with a well-known research institute in France, a feasibility study and tested various approaches using the XMTC.

Statements made from the floor

Delegation of Germany

8.   At the German Patent and Trademark Office (DPMA), two AI applications developed in cooperation with an external partner, have been used in patent examination practice since 2019, namely: (i) an electronic classifier for automated patent classification; and (ii) a cognitive search for prior art search.

9.   Since the last report of the Delegation of Germany at the 31st session of the SCP, the electronic classifier has been further trained with the German and European patent documents published in German or English language since 2010. The accuracy of the automated suggestions of the classifier at the subclass level allows a fully automated initial distribution of new patent applications to the patent division in the DPMA responsible for the respective subject area. The subsequent classification at the subgroup level is still carried out by the patent examiners in charge, but is assisted by an interactive classification tool.

10.   With respect to the AI-based cognitive search (available in German and English), the DPMA is involved in further training of the underlying models and improvement of the search results' relevance, for instance, by using all German patent documents on record for training the German model, etc. Additionally, the DPMA started using the AI-based tool of the World Intellectual Property Organisation (WIPO), i.e., "WIPO Translate", to translate Asian patent literature and has incorporated them into the DPMA's database.

Delegation of the United States of America

11.   The United States Patent and Trademark Office (USPTO) has continued to advance its efforts in AI-based text searching, AI image searching and AI classification, and is encouraged by the progress in these three areas.

12.   The USPTO has hired Mr. Jerry Ma for the newly created position of Director of Emerging Technology, who is in charge of new emerging technologies and AI (NET/AI) at the USPTO. He has the following duties and responsibilities: (i) shaping the USPTO's strategic vision in AI, machine learning and other emerging technologies; (ii) serving as the principle adviser and technical expert to the USPTO leadership on NET/AI matters; (iii) overseeing the USPTO's portfolio of technical investments in NET/AI for use in patent, trademark and corporate contexts; (iv) serving a key role on the USPTO's internal AI policy working group; and (v) performing academic, industry, inter-agency and international outreach towards ensuring that the USPTO's NET/AI initiatives are aligned with the USPTO's stakeholder community.

13.   Additionally, the President of the United States of America has nominated Ms. Kathi Vidal to be the next Under Secretary of Commerce for Intellectual Property and Director of the USPTO. Ms. Vidal has an extensive background in the field of AI, both from a practical perspective as an engineer and a legal perspective as an attorney.

Delegation of the Czech Republic

14.   The Czech IP Office recognizes the high potential of AI and its use in IP management in order to enhance services provided by IP offices. The Office is gradually increasing the use of AI in its activities. In particular, starting from 2024, it plans to launch an internal AI examination support, which will help examiners with file distribution, classification of patent applications and prior art searches.

15.   Furthermore, the Office is working on the creation of an automated IP helpdesk, which will enable the provision of IP-related advice in general. In the future, this service will be enlarged to provide information regarding the application procedures of different types of IP. In cooperation with the Czech Technical University, University of West Bohemia and Technical University of Ostrava, the Office plans to introduce a chatbot to improve its helpdesk service. While the use of voice recognition has been explored by the Office to improve the chatbot, it has been problematic for the Czech language.

16.   Finally, the preparatory work has been completed for the introduction of an automated classification and search system, for which the development work will take place during the next two years. The service should be ready for public use starting from 2024.

Delegation of Spain

17.   The OEPM has tested eight AI-based patent search tools for carrying out prior art searches. Further, the OEPM has compared the results of the examiners searches and the AI-based tools searches, in terms of both objectivity and precision. The results have been worse for the AI-based tools in areas where images play an important role in prior art searches, particularly in the area of mechanics. Generally, these tools provide a very good basis for the examiners to conduct the search, increasing its speed and efficiency.

18.   Overall, the OEPM is very far from the point where the AI-based search outcomes can substitute for examiners. The OEPM will be using the model that is being developed by the European Patent Office (EPO) in addition to its own model. The OEPM is confident that the use of the new EPO search engine will allow them to increase their search efficiency, which will in turn contribute to the quality of patents.

Delegation of the Republic of Korea

19.   The Korean Intellectual Property Office (KIPO) has used AI largely for classification, search and translation in order to support quality-ensured examination services. KIPO has been developing a classification recommendation system using AI, which is scheduled to be launched next year. This system has been developed based on patent classification training data gathered from the Korean Patent Gazette. Upon completion of the development of this system, quality and performance evaluation will be carried out. Thereafter, a trial service is scheduled to be operational in 2022.

20.   With regard to prior art searches, experiments were carried out in 2021 for the feasibility of an automatic search. When the experiment ends, a trial service will be provided to examiners in 2022.

21.   Finally, with regard to translation services using AI, KIPO has already provided English-Korean and Chinese-Korean AI translation services. In the case of German, French and Russian, their translation services are offered in cooperation with external service providers. KIPO has contributed to the quality assurance of patent examination through the aforementioned AI-based examination support services.

Delegation of Singapore

22.   The Intellectual Property Office of Singapore (IPOS) has been developing AI models for patent classification and prior art searching, as a pilot project for a selected set of technical fields, in cooperation with AI Singapore (Singapore's national AI program office). The results of this pilot project have indicated that further investigations would enable IPOS to understand how AI could benefit the Office and its users. Hence, IPOS has commenced the next phase of collaboration with AI Singapore and a local social institution, adding other technology fields in the pilot project.

Delegation of the Russian Federation

23.   The Federal Service for Intellectual Property (ROSPATENT) is actively working towards the digitalization of their office, in particular, the introduction of various digital tools, such as AI, for conducting patent examination and interacting with applicants.

24.   Currently, ROSPATENT has been using AI in the following processes: (i) machine translation of English-language patent documents and translation of the Cooperative Patent Classification (CPC) into Russian, using a hybrid machine translation system; and (ii) searching patent documents in the Russian PatSearch system using AI-based tools and methods.

25.   The immediate prospects for the development of the use of AI in ROSPATENT include the following main areas: (i) transferring existing solutions for searching patent documents and for machine translation to the newly created digital platform of ROSPATENT; (ii) creation of services for automatic classification of documents; and (iii) improving the quality of translation. The work undertaken by WIPO in the area of blockchain technologies can considerably improve the use of AI for the examination of patents.

Delegation of Canada

26.   The Canadian Intellectual Property Office (CIPO) has been exploring potential use of AI-enabled tools to facilitate its IP administration, patent examination and service delivery. CIPO has also been monitoring international developments on this important issue. As part of their ongoing IT modernization program, CIPO is appreciative of the incredible potential of AI tools towards the continuous improvement of the quality and timelines of patent grants.

27.   For Member States with limited exposure to this new technology of AI, the Delegation shared its view that each patent office did not need to develop AI technology in-house to be able to enjoy the benefits of these new technologies. CIPO's patent examiners have utilized search databases that have AI-powered translation and searching algorithms. In CIPO's experience, these AI-enabled tools help examiners find prior art with higher relevancy to the patent application under examination, in certain areas of technology. Off-the-shelf solutions can be a relatively inexpensive and effective way to begin exploring and assessing the benefits of AI technology.

Delegation of Venezuela (Bolivarian Republic of)

28.   The Autonomous Service of Intellectual Property (SAPI) is a very small office, with the aim of providing a more efficient patent system. SAPI is cognizant of the fact that AI technologies can be very useful for translation and classification of patents.

29.   The Delegation requested the Secretariat to list all the AI-based techniques being used by larger patent offices, which could make it possible for smaller patent offices to make use of such tools and achieve the objective of better quality of patents.

Delegation of Paraguay

30.   The National Directorate of Intellectual Property (DINAPI) is strengthening its technological platforms with the aim of full digitalization of its procedures. AI is, or will be, the most useful tool to optimize the time spent on prior art searches by examiners (which at DINAPI are small in number).

31.   Furthermore, since DINAPI has to consult databases and analyze hundreds of prior art documents to complete its examination work, AI will be an indispensable tool to provide greater accuracy in patent examination and patent classification.

Delegation of Kenya

32.   AI has been gaining ground towards assisting in the processing of patent applications. The Delegation of Kenya took specific note of the fact that the service managers of INPI, France were able to save 10 hours per week by virtue of employing AI in their examination processes. The Delegation of Kenya was further impressed by the "Confusion Matrix", presented by the Delegation of France, showing only 9% error.

33.   Given that Kenya has a national patent office that undertakes substantive examination of patent applications, it experiences that oftentimes, patent applications cannot be processed within due timelines. Therefore, the Delegation was of the opinion that deployment of AI in its patent examination process could result in improvement of the timelines. In this respect, the Delegation suggested a tripartite cooperation with the Member States that are already deploying AI in the processing of patent applications and the Secretariat, aimed at assisting Kenya to deploy AI at appropriate levels of processing patent applications.

Delegation of Colombia

34.   The Superintendence of Industry and Commerce (SIC), the industrial property office of Colombia, has been developing its own AI-based tool for carrying out classification of patent applications. After having this tool for a year, the SIC has witnessed how the tool made it much easier for its examiners to conduct the patent classification work.

Delegation of Iran (Islamic Republic of)

35.   The Delegation of Iran (Islamic Republic of) sought clarification from the Secretariat regarding the following queries: (i) are there any data or figures on the number of countries that have used AI for classification, examination and translation of patent applications; and (ii) what are the main obstacles and barriers for countries that have not yet used this modern technology for the aforementioned purposes.

36.   In response to the first question, the Secretariat clarified that while multiple offices had presented their experiences during a few SCP sharing sessions on the use of AI technologies in patent offices, it did not have specific figures in that respect. Regarding the second question, the Secretariat stated that one of the challenges was collection of data for training AI machines for the purposes of the patent procedure. High-quality data, which are not always easily available, are required for the training and development of accurate AI-based tools. Furthermore, in the context of scarcity of data for training AI machines, there are greater challenges in gathering a sufficient amount of patent document data in specific national languages that are not widely used.

International Federation of Intellectual Property Attorneys (FICPI)

37.   The Representative of FICPI stated that the quality of granted patents depends on the quality of incoming patent applications. Use of high-quality search tools by applicants and third parties leads to better quality patent applications and, hence, better quality granted patents. The high cost of commercially provided prior art search services and automated tools makes such services and tools generally inaccessible to many users of the IP system, including individual inventors and small and medium-sized enterprises (SMEs).

38.   Several IP offices are developing automated tools to enhance classification, search and examination of patent applications using machine learning, natural language processing, image recognition and other AI-based technologies. Furthermore, IP offices have a general obligation to improve access to the IP systems by all users, particularly individual inventors and SMEs.

39.   In view of the foregoing, FICPI is of the opinion that IP offices, applicants and third parties would all benefit, if more patent applications and third-party oppositions were prepared and filed with the assistance of high-quality automated tools. Hence, FICPI stated that IP offices should make their automated tools available to all users of the patent systems at no cost or reasonable costs.

Delegation of Australia (written statement)

40.   Within the broader program of modernizing the patent system and improving its services, IP Australia has been using AI for examination of patent applications through different initiatives.

41.   One initiative is the Patent Auto Classification service, which automatically classifies patent applications according to the IPC and allocates them to the correct examination sections. There is also an Automated Preliminary Search Tool, which carries out an automated search of published patent applications as well as non-public patent applications from the internal databases of IP Australia, by using automatically generated search queries containing the names of applicants and inventors as well as IPC and CPC symbols. Another initiative is the Outcome-Based Directions model, wherein IP Australia is using a machine-learning model that directs applicants to request examination when the applicant's patent strategy is more developed and ready to enter the examination process.

42.   Some of the other AI-based initiatives are as follows: (i) the (Patent) Family Member Analyser (FMA) tool, which retrieves published family member information for a patent application and presents it in a way that allows easier visual comparison of the claim sets; (ii) the Foreign Examination Report (FER) Feature Analysis, which helps extract relevant objection and citation information from foreign examination reports on related applications identified by the FMA tool; and (iii) an Automated Decision-Making Governance Framework, which establishes the structures and controls for the automation of decisions in IP rights administration. IP Australia is keen to harness the benefits of AI and automation in order to achieve efficiency gains in all aspect of patent examination and administration.

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