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Standing Committee on the Law of Patents

Thirty-Second Session
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REPORT OF THE SHARING SESSION WITH RESPECT TO THE USE OF ARTIFICIAL INTELLIGENCE (AI) FOR EXAMINATION OF PATENT APPLICATIONS, AND INFORMATION RELATING TO WIPO'S TECHNICAL ASSISTANCE ACTIVITIES RELATING TO USE OF AI AS TOOLS FOR PATENT OFFICES

Document prepared by the Secretariat

INTRODUCTION

1.   Pursuant to the decision of the Standing Committee on the Law of Patents (SCP) at its thirty-first session, held in Geneva from December 2 to 5, 2019, the present document contains a report of the sharing session, held on December 3, 2019, with respect to the use of artificial intelligence (AI) for examination of patent applications, and information relating to WIPO's technical assistance activities relating to use of AI as tools for patent offices.[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=50453. 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/SCP31/SCP_31_2019-12-03_AM_1_mp4.html, respectively.

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

Presentations

Delegation of Japan

2.   Complexity and advancement of technologies as well as expansion of the scope of prior art due to the growing number of patent applications filed worldwide have necessitated use of AI in the business operations of the Japan Patent Office (JPO). The ultimate goal of using AI technologies is to conduct higher quality and more efficient business operations, and, as a result, to improve services provided to the users. Technologies such as machine learning, neural language processing and deep learning are used to that end.

3.   The JPO's initiatives for using AI included: (i) conducting feasibility studies on how AI technology could be applied to business operations (2016); (ii) conducting the proof of concept (PoC) (2017); and (iii) making preparations for introducing support tools for JPO's operations (2018).

4.   Among other activities, in 2018, the JPO started PoC projects on patent image search (patents drawings) and design image search. In 2019, the JPO started two PoC projects focusing on search result ranking and summarization. To install state of the art technologies into the office operations, AI-based tools have been developed by an in-house team using an agile software development approach.

Delegation of the United Kingdom

5.   The AI tools, if designed and implemented correctly, have the potential to boost examiners' efficiency and patent quality. The Intellectual Property Office of the United Kingdom (UKIPO) is still in the early stages of exploring and developing AI tools for examination of patent applications.

6.   The UKIPO has been using the government's Regulators Pioneer Fund to explore AI solutions that could enhance and modernize the online filing process for IP rights. Within this scheme, with respect to patents, the UKIPO is undertaking a study to understand the feasibility, technical complexities, and effectiveness of AI-assisted prior art search.

7.   The feasibility study is undertaken by the Cardiff University, focusing on how AI could assist patent examiners in the prior art search process. The aim of the project is to run an AI algorithm to read the text of the patent application, scan various patent databases, and determine the top 50 documents that it considers to be the most relevant to the invention. The key part of the algorithm developed to date involves keeping 'human-in-the-loop' to utilize expertise and experience of patent examiners. The algorithm testing commenced in October 2019. The results of the testing would be presented to the UKIPO, following which the it would consider the next steps.

Delegation of France

8.   The National Institute of Industrial Property (INPI) project focusing on AI aims to improve the efficiency of processing of applications.

9.   Around 450 patent applications per week are filed with the INPI. The applications received are dispatched to examination teams manually, which takes around 20 hours per week. Thus, there is an operational need to create a tool which would automatically sort and

dispatch the applications to the appropriate teams, thereby saving time spent for such work. In this respect, an AI tool has been developed, and is in the production stage. As regards the performance of the tool, 85 per cent of accuracy was recorded by the tool (the human dispatching accuracy was around 90 per cent). The impact of the AI model in terms of time saving is eight hours per week.

10.   The INPI's future plans on AI includes working on pre-classification of patent applications and developing collaborations with other patent offices on AI-related projects.

Delegation of Spain

11.   The Spanish Patent and Trademark Office (OEPM) is examining how AI could be applied in its operations. Two areas where AI would be relevant to the work of the office are the patentability of AI-related inventions and the use of the AI technology in patent offices. On the latter, the AI technologies may be used for classification of patent application, chatbots, automatic translation of patent documents, examination on formality or exclusions from patentability, prior art search and writing assistance.

12.   The OEPM has tested eight AI-based patent search tools by carrying out prior art searches. Based on its experience to date, it has not been possible to rely exclusively on AI-based patent search engines. However, these search engines could provide a good starting point for prior art search. That is particularly important for offices that may not necessarily have well-specialized patent examiners. The AI technology would enable offices to address the issue of constant increase of workload affected by the use of AI in a generation of inventions and by the increasing number of patent applications that claim AI inventions themselves.

World Intellectual Property Organization (WIPO)

13.   The Representative of the International Bureau of WIPO presented AI-based tools and applications being developed by WIPO. In particular, the Representative presented three areas of its work: (i) text processing; (ii) image similarity processing; and (iii) speech processing. As regards the text processing, the WIPO Translate (a neural machine translation tool), IPCCat-neural (neural text categorization for International Patent Classification (IPC)), as well as ongoing projects on transliteration and chatbots were presented. Furthermore, the presentation of the speech-to-text tool as well as other projects in the development stage, i.e., search in video-audio and speech to translated text, were presented.

14.   In the future, WIPO Translate will be extended to other languages and to written opinion/international search reports. In addition, experiments are being conducted on search by text similarity and name transliteration.

15.   WIPO is expanding AI footprint to assist IP Offices and users of the IP system globally. [2] WIPO is mindful of the growing global digital divide and thus committed to providing inclusive access to WIPO AI tools. Currently, a demand-driven approach in licensing of WIPO-developed AI tools is being followed. WIPO continues to drive inter-IPOs cooperation on AI by organizing conferences and running surveys, championing data and AI-tool sharing through collaboration.

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[2]   For further information on WIPO's technical assistance activities relating to AI tools, see paragraphs 38-40 of this paper.

Statements made from the floor

Delegation of Uganda on behalf of the African Group

16.   Use of AI contributes to the efficiency of the patent grant process and ultimately to the quality of a granted patent in the office procedures. However, AI is yet to be deployed by offices for limited tasks and the human element remains very important. Considering the limited application of AI at the moment, the Committee should take a cautious approach in discussing AI. The SCP should develop a balanced work program that will ensure that the already existing digital divide would not expand further. In particular, the Secretariat should undertake a cost-benefit analysis on the use of AI in patent offices in the form of a survey. The survey should determine the readiness or lack of readiness of AI use by offices in developing countries and least developed countries (LDCs), and identify existing gaps so that WIPO would be able to determine what kind of work should be undertaken to assist Member States to build their capacities in that regard.

Delegation of the Czech Republic

17.   The National AI Strategy was adopted in March 2019. The Strategy follows and supports the Innovation Strategy of the Czech Republic from 2019 to 2030, which was approved by the Government in February 2019. The Czech IP Office is currently working on the measures to implement the goals of the IP pillar of the Innovation Strategy.

18.   The Czech IP Office recognizes the high potential of AI and its use in IP management in order to enhance services provided by the IP system to users. The Office is gradually increasing the use of AI in its activities. In particular, starting from 2021, it plans to launch an internal AI examination support, which will help examiners with file distribution, classification of patent applications and prior art search.

19.   Furthermore, the Office is working on the creation of an automated IP help desk, which will enable the provision of IP-related advice in general. In the future, this service will be enlarged in order to provide information relating to application procedures of different types of IP. In cooperation with the Czech Technical University, the Office is planning to introduce a chatbot to improve its help desk service. Finally, the Office is considering the implementation of the machine translation project, which will make the content of the national IP databases available in foreign languages.

Delegation of Singapore

20.   The National AI Strategy was launched in Singapore in November 2019. It spells out Singapore's plan to deepen the use of AI technology to transform the economy in a way that it goes beyond mere adoption of technology, fundamentally rethinking business models, making deep changes to reap productivity gains and creating new areas of growth. The Singapore IP Office (IPOS) has taken steps to leverage AI technologies to better serve its stakeholders. In relation to patents, IPOS is developing AI for patent classification and prior art search, in cooperation with AI Singapore (AISG), which is a national AI program and a research institution. The results of the project are expected within a year. Another tool launched by IPOS in August 2019 is a mobile application for trademark registration called IPOS Go. AI has enormous potential in transforming the way IP offices operate and their services delivered to applicants.

Delegation of Germany

21.   The German Patent and Trademark Office (DPMA) is currently developing two AI applications for the use in the patent administration and patent examination processes. They have been trained with published patent applications, granted patents and utility models. The first application is for automated patent classification of incoming patent applications according

to the IPC, which improves the distribution of patent applications to examiners within the electronic system of the DMPA. The new classifier is, or is planned to be, applicable for reclassification and maintenance of patent literature, among others. The supported languages are German and English. The classifier was set into production on October 1, 2019.

22.   The second application is a new patent search tool, in which cognitive search is being developed and evaluated by a selected group of examiners of the DPMA. The cognitive search client provides a prior art search or pre-search function which automatically generates a list of content-related patents for a given document or text input. In the result list, words with similar meanings as the input text are highlighted. In order to allow for a cross-lingual search, English and German models have been prepared. In March 2019, several functionalities have been improved and added in a new version of the cognitive search.

23.   Further work on the project aims at training those tools with the whole document set of the DPMA, consisting of 118 million patent documents. Particular objectives are, for example, the improvement of the cross-lingual search and integrating non-patent literature in model training. For the future, the DPMA considers that AI could be of particular relevance in the fields of translation of patent documents, image search and recognition, and search in chemical formulas and sequence listings.

Delegation of the United States of America

24.   The United States Patent and Trademark Office (USPTO) is actively investigating the use of AI to help to develop solutions that can improve examination of patent and trademark applications. The USPTO will hire a senior level AI expert whose responsibilities will include providing technical expertise in AI and providing input on high-level decision making regarding production and operational implementation of AI in the USPTO. The AI expert will advise on the automation strategy and identify ways to leverage AI in the business processes and will develop an AI roadmap for the USPTO.

25.   The USPTO has three primary goals with respect to AI: firstly, to improve the examiner's ability to obtain the relevant prior art, secondly, to increase efficiencies throughout the patent prosecution process, and thirdly, to optimize development and delivery of IT tools. The areas that the USPTO is currently focusing on include use of AI in pre-search tools, and an auto-classification tool to assist examiners with the routing of applications. The Delegation noted a duplication of efforts by the IP offices with regard to such AI projects.

Delegation of Iran (Islamic Republic of)

26.   AI has a great potential to affect the function of IP offices in general and patent examination, in particular. Noting that these new technologies are available in a limited number of countries, the capacity of the offices to use AI, the challenges of the offices in LDCs and developing countries in that respect, and the method of delivering the technical assistance to these offices enabling them to use AI, should be discussed by the Committee.

27.   The global technological gap, and the importance of narrowing it, necessitate a cautious approach by the Committee. There is a need to consider whether using AI will reduce the cost of the patent examination process or will it increase the cost, potentially affecting the application fee. The Committee needs to explore whether the use of AI could be extended to all aspects of the patent grant process or would it be limited to particular aspects of the process. The territorial application of the patentability criteria with different thresholds, for instance on the novelty criterion, is another element which affects the role of the AI-based examination process. Therefore, substantive examination should maintain a human interface, based on the review by a patent examiner.

Delegation of Indonesia

28.   Indonesian IP Office is in infancy regarding the integration of AI into its operations. While the Office is interested in AI technology and the opportunities it presents to improve efficiency, a cautious approach is needed to minimize possible errors that are to be expected in all first generations of technology. The Delegation supports the view that keeping a human in the loop is needed.

29.   The Office is interested in collaborating with countries that have integrated AI into their operations. It is interested to know the cost effectiveness of setting up the AI system compared to the traditional system. It is also interested to know whether the WIPO Secretariat could extend the use of WIPO Translate to the translation of laws and publications in different languages.

Delegation of Australia

30.   IP Australia is in the early phases of adopting AI tools to assist examiners in the examination process. IP Australia is working on a patent classification tool that automatically allocates patent applications to the examination sections. The tool uses machine learning technologies to analyze the contents of each patent case and predict the relevant technology groups. As the classification produced by the tool is at a high level, the examiner checks that the application has been allocated to the right technological area and if the classification is deemed not to be accurate, the examiner can reassign it to an appropriate section.

31.   Furthermore, IP Australia is working on an automated preliminary search tool that searches the potential citations. The tool carries out an automated search of published patent specifications by using search queries containing the names of applicants and inventors and IPC and Cooperative Patent Classification (CPC) symbols. The tool was released in November 2019. The third tool, which is being developed, is the patent family member analysis tool, which aims to retrieve published patent family member information of a patent application and present it in a way that allows for an easy visual comparison of claim sets.

32.   The Patents Act has been amended to allow the Commissioner of Patents to arrange for the use of a computer program to make decisions, exercise powers and comply with the obligations under the legislation. The use of computerized and computer-assisted decision making will improve the timeliness and accuracy of decision making and enable staff to deal with more complicated matters. The IP Australia is keen to harness the benefits of AI to achieve efficiency gains in all aspects of examination and administration and improved outcomes for staff and customers.

Delegation of Chile

33.   The government of Chile is drawing up a work plan on AI which envisages the initiation of an AI Policy and Action Plan for the year 2020. The National Institute of Industrial Property (INAPI) has been using AI-based search engine with respect to trademarks and is in the process of evaluating the application of similar tools for other INAPI operations, including with respect to processing of patent applications. The INAPI is also collaborating with other IP offices on this topic.

Delegation of Pakistan

34.   AI-based support tools for examiners bring an efficiency to the process. While the Delegation expressed its appreciation to WIPO for its progress on AI-based tools, there is still a need to guide Member States in devising both short-term and long-term AI policies for national

IP offices to integrate AI-based tools efficiently. The Delegation therefore suggested the Secretariat to enhance a role of WIPO Advanced Technology Application Center. It also suggested that WIPO integrate AI-based solutions in its Industrial Property Automation System (IPAS).

Delegation of Brazil

35.   The Brazilian Patent Office is beginning to develop AI tools in order to improve the automated prior art search to expedite the examination of patent applications. The Office has introduced neural networks in its management system, enabling the pre-classification of patent applications and subsequent distribution to the technical divisions. The Delegation expressed its interest in cooperating with other patent offices with a view to improving their examination tools on AI.

Delegation of India

36.   There is no doubt that, in the near future, the progress in the digital world will be based on the pillars of AI, block chains, etc. Accordingly, the IP world cannot remain a mute spectator to the technological changes. The Indian IPO is exploring the options of implementing AI and block chain in the patent-related procedures for faster and securer processing of IP applications. The benefits of AI technologies should not be limited to a few countries, but should also need to be assessed by the developing countries and LDCs for holistic development of the IP system, as well as to augment the steps of fulfilling the Sustainable Development Goals (SDGs). The steps of providing chatbots and other features may be carefully analyzed from the perspective of the applicable national law.

Delegation of Cameroon

37.   Taking into account existing technological divide between countries, the SCP should continue exchanging on the issue of AI. A document compiling different AI-based tools utilized by offices could be produced. Noting that the use of AI technologies requires a substantial change to the examination systems, the Delegation questioned what the cost of such a change would be; whether AI could drastically decrease the timeline for the processing of patent applications; what are the margins for mistakes; and whether AI could become a hindrance rather than an advantage.

WIPO'S TECHNICAL ASSISTANCE ACTIVITIES RELATING TO AI TOOLS

38.   AI tools developed by WIPO have been made available to patent offices of its Member States through a licensing scheme for free. Currently, the available tools include WIPO Translate, WIPO Speech-to-Text and WIPO's image similarity search for trademarks.

39.   These tools are also licensed free-of-charge to United Nations (UN) organizations and are available for a fee to private companies. Tools currently under research and development concern classification (IPC, CPC and Vienna Classification) and image similarity search for industrial designs.

40.   In relation to technical assistance activities for the development of AI tools in WIPO Member States, the major challenge comes from the fact that AI machine learning requires a high volume of training data of a high quality. For example, if an IP office wishes to develop a national AI tool for machine translation, search or classification relating to patents, the prerequisite for developing such an AI tool is to have full patent documents in the appropriate digital format in order to build training sets for machine learning applications in the language of the office.

41.   To establish searchable national patent collections and to facilitate innovation with a better dissemination and discoverability of patents, WIPO, jointly with the European Patent Office (EPO), runs a project to assist IP Offices in producing searchable full text for their front file patent publication in ST36 XML format with embedded TIFF images. WIPO adapts its OCR solution to each office's specific requirements (language, layout, bookmarks etc.). 34 offices have received the software and have been trained to use it in the last three years, with 12 of them having launched it in production. The produced full text documents are included and made searchable both in WIPO's PATENTSCOPE and EPO's Espacenet. The outcome of this project may also be used for machine learning training data.

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