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MEETING OF INTELLECTUAL PROPERTY OFFICES (IPOS) ON ICT STRATEGIES AND ARTIFICAL INTELLIGENCE (AI) FOR IP ADMINISTRATION

organized by
the World Intellectual Property Organization (WIPO)

Geneva, May 23 to May 25, 2018

ORIGINAL REPLIES FROM IPOs IN ENGLISH, FRENCH OR SPANISH

Prepared by the International Bureau of WIPO

AUSTRALIA

Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trade marks, machine translation, etc)

- o Patent Auto Classification Tool (Under development) – The tool aims to analyze the contents of a patent application in unstructured PDF documents and predict relevant technology groups enabling prioritization and allocation to appropriate patent examiner sections.
- o Trade Mark Assist (Beta) – our interactive 24/7 tool designed to educate and assist unrepresented trade mark applicants (in particular Small and Medium Enterprises) through the initial stages of the application process.
- o Smart Assessment Toolkit (Under development) – a collection of advanced models designed to support trade mark examination and predict objections.
- o Australian Trade Mark Search – Image Search (Live) – to search for existing trade mark images, based on a given image.

A description of specific AI systems in use (such as the name of a commercially available system, or an in-house development system, a description of functions, data used to train the AI systems, etc.)

- o The Patent Auto-Classification application uses internally developed software / machine learning technologies to build sophisticated hierarchy classification models to analyze the contents of each patent case in unstructured PDF documents. The predictive models have been trained using IPA specific patent data, and will be extended with larger patent datasets from USPTO and EPO.
- o Trade Mark Assist uses publicly available word association models for searching Goods and Services and classifications. The model is being trained by trade mark examiners on a regular basis, who are given a list of terms and rank result relevance.
- o Smart Assessment Toolkit uses a combination of natural language processors and internally developed software trained by a dataset of historic adverse reports from 2008 to 2016 to detect similar existing trademarks. Once trained, it provides high ranking results to the user.
- o Australian Trade Mark Search uses commercially available Trademark Vision Image Recognition software for image search functions.

AUSTRALIA

Experience and other useful information to share with other IPAs (reliability, human interface, any impact on the work, lessons learned, etc.)

- o The Patent Auto-Classification (PAC) tool is intended to save staff time, streamline the tech sorting process and achieve comparable accuracy to the current manual process. The focus of the pilot has been on the International Examination Search System (INTESS) in which international patent application cases are automatically allocated to the correct team's work tray for examination. The PAC pilot is undergoing final review and testing before being released to production. Opportunities to extend PAC to distribute national applications in the Patents Administration Management System (PAMS) and to other patent classifications and search functions are under investigation.
- o Automated Decision Making Governance Framework and Policy – we have drafted a framework and policy to govern and help manage the risks associated with automating IP Rights administrative decisions.
- o Variation in examination decision making (over time and between examiners) makes it very difficult to determine the ground truth and test accuracy of machine learning algorithms.
- o We have experienced difficulties in documenting what a machine learning model has learnt over time, and how this has impacted the models outputs.

AUSTRIA

Dear Madam, Sir,

Many thanks for inviting us to participate in the survey on the application of Artificial Intelligence (AI) in the administration of Intellectual Property Offices (IPOs).

As far as the Austrian Patent Office is concerned I would like to inform you that we are currently in a trial period with several commercial providers in the field of pre-search, pre-classification and classification. Still being in the evaluation phase unfortunately we are not yet in a position to answer the questions raised in a more detailed manner.

Nevertheless, we are very interested in the developments and results in this special field. Please keep us informed about the outcome of this survey and possible follow-up actions.

We hope this small piece of information was helpful for you and are looking forward to any further future work.

Kind regards,

Elisabeth Lager-Süß

Elisabeth Lager-Süß
International Relations
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www.patentamt.at

BELARUS

Dear Colleagues,

With reference to the Circular C. 8706 from October 11, 2017 concerning the application of Artificial Intelligence (AI) in the administration of Intellectual Property Offices (IPOs), kindly be informed on the following.

The National Center of Intellectual Property of Belarus does not have any experience in using AI systems, for instance, for processing applications, in its administration.

However, we would like to express our high interest in studying other IPOs' experience in applying such systems for the purposes of eventual implementation of AI in the work of our experts. In this regard, we would much appreciate assistance of WIPO.

We thank you for your cooperation.

With best regards,

International Cooperation Division
National Center of Intellectual Property
Republic of Belarus

BRAZIL

INPI keeps track of distinctive initiatives and tools furnished by suppliers in regards to data mining and/or patent data bases. A general overview of these developments may be observed in *Patent Information Group, Inc* – www.piug.org.

Internally we need: a tool that may automatically carry out classification of the patent application in IPC and/or CPC, preliminary search in regards to the state of art, as well as a preliminary report of searching, with high level of reliability, which may optimize patent exams.

Search tools based in images is another need specifically applied to Utility Models and some applications in the field of mechanical engineering, whose logic may be applied to other fields of INPI, such as Industrial Designs and or Trademarks.

INPI is currently carrying on an initiative by the means of the development of a neural network focused towards pre-classification and distribution of applications among the technical divisions, the SISCAP. However, there is urgent need in regards to adequacy - which implies learning and retraining processes- for the functioning of greater reliability and evolution. Based on market researches, the most adequate tool would be the *Math Lab.*

It is important to stress that INPI regularly contacts current suppliers as well as database suppliers, including its competitors questioning on the existence of ready-to-use tools for commercialization or development. We have identified a few customized developments for patent offices that called our attention, in particular *Clarivate Analitcs*, by *CAS* and *LexisNexis*.

CANADA

CIPO has conducted internal interviews to assess how we use AI and big data in our own internal operations, as well as our external service offerings. Here are our responses to your request:

(a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)

CIPO's Patent Branch uses commercially available semantic AI search engines to assist in conducting searches for prior art and citations. These tools rely on machine learning algorithms to better detect linkages between citations, applications, and the current state of the art. Patent examiners also make use of Google's algorithms, specifically within their "Translate", "Patent", and "Scholar" tools.

CIPO's Economic Research and Strategic Analysis Unit also uses AI to help them conduct semantic searches and to collect, scrub, and analyze large datasets.

(b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

The list below describes commercially available systems used at CIPO:
Patent Search Services:

- **Questel** – Orbit (https://www.questel.com/): web-based services for productivity and collaboration dedicated to intellectual property with search, monitoring, analysis and idea-to-asset management capabilities.
- **STN** (https://www.cas.org/products/stn): access the world's disclosed scientific and technical research
- **Clarivate Analytics** (https://clarivate.com/product-category/patent-research-intelligence-and-services/): access to a large scientific citation index and an editorially enhanced patent database with over 1.75 million journal publications and more than 200,000 clinical trial records.

  - **Google Suite** (Translate, Patent, and Scholar): machine translation and access to full-text documents and claims forms from contributing international patent offices in real time with the added addition of being translated, provided citation metrics and related scholarly publications.

CANADA

Data Manipulation:

- **Vantage Point** (https://www.thevantagepoint.com/): text-mining tool for discovering knowledge in search results from patent and literature databases while provided methods to refine, automate, import, etc. the raw data produced.

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

- CIPO is exploring the use of the IBM Watson suite of tools to conduct engagement with clients through social media outreach and analytics.
- We are also exploring the viability of using block chain to streamline our copyright registration process and attempt to encourage information sharing by rights holders.
- Finally, in the context of ongoing economic research, we plan to explore the feasibility of machine learning to answer IP policy and research questions.

CHILE

a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)

At this moment, INAPI together with the University of Chile (Engineering School), leads a project for the development of an image search system based in an algorithm developed by the Engineering School to be used in the search of figurative trademarks. This project, funded with public resources coming from the research and development area, is in the evaluation stage and for this moment is being used by the trademarks examiners.

(b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

It is a development carried out by expert professionals from the University of Chile, who applied together with INAPI to a public fund to finance the project.

At this moment the University of Chile, together with an external company, is developing the business model, regarding how the system will be commercialized. At the moment it does not have a definite name. The system is being trained with the image database of INAPI.

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

The system works perfectly well. For this development INAPI had to applied to a public fund of innovation, which delayed the start of the project, but the use of the application is cheaper than buying a commercial package of artificial intelligence. This could be more convenient in a long term.

In the testing stage, the user interface had to be very simple and friendly, this is for examiners to become familiar and use the system.

CHINA State Administration for Industry & Commerce (SAIC)

Dear Madam/Sir,

This is the International Cooperation Department of State Administration for Industry and Commerce of China.

Your letter about providing information about IP-related AI technology has been well received.

The Artificial Intelligence (AI) Systems that SAIC is using and developing are as followed:

First is the Standard Goods System being used.
The system would allocate each goods into a similar group so as to establish the Goods Relation Dictionary. With this dictionary, system would automatically allocate newly-supplied goods into respective similar group. For goods supplied for the first time, a mother goods would be designated.

Second is the Automatic Administrative Region Matching System being used.
The administrative region can be fixed through vaguely match so as to provide data support for future regional statistical analyses.

Third is the Image Search System under construction.
This system is under development, which provides relatively accurate and reliable results. This system can search backward with result to figurative elements and results would be input into the system after examiners' confirmation. In this way, they system can achieve self-innovation and self-learning and search efficiency would be improved.

CHINA State Intellectual Property Office (SIPO)

Dear WIPO Secretariat,

After consulting with related departments, the AI utilization in China in IP field is still at very beginning stage, so my office has very little information to provide at present to the survey.

Thanks a lot.

Best regards.

Sheng Li
SIPO

COLOMBIA

On behalf of the Superintendence of Industry and Commerce from Colombia we want to thank for the sharing of this survey. Unfortunately our Deputy Superintendence for Industrial Property doesn´t apply Artificial Intelligence (AI) in its administration yet. That is why we aren´t able to answer the survey.

Best regards,

Cristina Rodríguez Corzo
Coordinadora Grupo de Trabajo de Asuntos Internacionales | International Affairs Coordinator
Superintendencia de Industria y Comercio
Tel: (57) (1) 5870000 ext. 10630

PHILIPPINES

SURVEY ON THE APPLICATION OF ARTIFICIAL INTELLIGENCE (AI) IN THE
ADMINISTRATION OF INTELLECTUAL PROPERTY OFFICES (IPOS)

Intellectual Property Office of the Philippines

(A)   ANY RELEVANT BUSINESS SOLUTIONS MAKING USE OF AI AND BIG DATA (SUCH AS CLASSIFICATION
OF APPLICATION FILES, IMAGE SEARCH OF TRADEMARKS, MACHINE TRANSLATION, ETC.):

-AND-

(B)   A DESCRIPTION OF SPECIFIC AI SYSTEMS IN USE (SUCH AS THE NAME OF A COMMERCIALLY
AVAILABLE SYSTEM OR AN IN-HOUSE DEVELOPMENT SYSTE, A DESCRIPTION OF FUNCTIONS, DATA
USED TO TRAIN THE AI SYSTEM, ETC.):

IPOPHL is currently using a third-party search engine called DTSearch for its patent search operations.
Similar to all other search engines, the system has the capability to perform incremental index, fuzzy search,
and other functions. Although the said system is a low-end for of AI, it is more powerful than the traditional
database search.

The ASEAN TMView, ASEAN DesignView, WIPO ASEAN Patentscope, and IPOPHL eTMFile platforms
also make use of free search engine systems such as SOLR.

IPOPHL also uses COGNOS, a commercially available Business Intelligence Software, to support the
management reporting requirements of the Office. In using this system, IPOPHL undertakes an ETL (extract-
transfer-and load) process from the IPAS database into COGNOS readable packages.

(C)   EXPERIENCE AND OTHER USEFUL INFORMATION TO SHARE WITH OTHER IPOs (RELIABILITY, HUMAN
INTERFACE, ANY IMPACT ON THE WORK, LESSONS LEARNED, ETC.)

Based on IPOPHL's experience, the reliability of any search system would depend on the accuracy of the raw
data to be processed.

We have also noted that an image search system for trademarks would be a good enhancement of the IP
administration system, while "data mining solutions" would provide the foundation for a knowledge
management system that would be useful to address the inconsistencies in IP examination results.

FINLAND

RESPONSE
C.8706

PRH
FINNISH PATENT AND REGISTRATION OFFICE

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C. 8706 SURVEY ON THE APPLICATION OF ARTICIAL INTELLIGENCE

RESPONSE OF THE FINNISH PATENT AND REGISTRATION OFFICE

In the Note C.8706, the International Bureau invited the member states to provide information to the Secretariat of WIPO. Below is the requested information on the artificial intelligence (AI) systems used at the Finnish Patent and Registration Office.

a) During the current year, we have been testing an AI solution for finding similar patent publications to aid in the classification and novelty search of a patent application.

b) The system being tested is Teqmine by Teqmine Analytics Oy. The system finds publications that are similar to the application being analyzed by using the vocabulary and bigrams of the application. The input to the system is the text (description, claims, and abstract) of the application. Based on the frequency of the words and bigrams extracted from this input file, the system determines the activity levels of a number of topics, and determines a number of similar publications where these topics are active at similar levels. These topics were generated when the system was trained on the whole patent corpus (WO, US, and EP patent publications from the past few decades). The output file is in a format that can be read into EPOQUE Net. The output file consists of about 2000 patent families ranked by similarity. The system runs on our own server, and the server can only be accessed from within our own network. Therefore, the system can also be used for non-public applications. The system processes a patent application in less than two seconds.

c) The publications in the output file are usually broadly related to the topic of the application. Often at least a portion of the most common patent classes of the publications are related to the application in a meaningful way. However, sometimes the publications are not related to the application or invention, especially when the application uses very common words to describe the invention. The system thus cannot be relied upon to find the relevant prior art, but it may in some cases point towards a useful direction. Currently, the system does not significantly speed up the prior art search. Our near-term aim is to compare the system to existing commercial systems (such as Innovation Q Plus) for finding documents that are similar to a given sample text. However, only public applications can be tested on such systems that run on outside servers.

Yours sincerely

FINNISH PATENT AND REGISTRATION OFFICE

GABON

Nous venons suite à votre courrier du 11/10/2017 répondre à l'enquête sur l'application de l'Intelligence Artificielle à l'administration des Offices de propriété intellectuelle.

S'agissant des questions :

a) l'Office Gabonais de la Propriété Industrielle (OGAPI) n'utilise pas d'intelligence artificielle pour des travaux administratifs quelconques. En effet crée par le décret présidentielle n°0308/PR/MIMT du 25 Septembre 2014, l'OGAPI n'a pas encore été doté à l'heure actuel d'un système utilisant l'intelligence artificielle pour le traitement d'éventuelles données.

b) nous sommes dans l'incapacité de fournir une description des systèmes d'intelligence artificielle particuliers qui sont utilisés;

c) nous sommes dans l'incapacité de fournir des données d'expérience et autres informations utiles à partager avec d'autres offices;

Salutations distinguées

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Responsable du Service des Marques,Dessins ET Modèles Industriels
OFFICE GABONAIS DE LA PROPRIÉTÉ INDUSTRIELLE

GERMANY

The German Patent and Trade Mark Office (DPMA) welcome the opportunity to participate in a survey on the application of Artificial Intelligence (AI) in the administration of IPOs.

At present, the DPMA does not yet use "strong" artificial intelligence in the administration of patents, utility models, trademarks and designs. However, the DPMA uses programs that can be categorized as "weak" artificial intelligence. These are programs that simulate intelligent behavior by means of mathematics and computer science and perform certain tasks.

Since 2011 the DPMA has used an electronic classifier on the basis of statistical procedures for the classification of patent and utility model applications according to the International Patent Classification (IPC). This classifier is currently being revised (beginning of the project in 2016) and is to provide more precise proposals for the classification by using artificial neural networks. Details about this electronic classifier and its current revision can be found in the **annex**.

In the field of trade marks, many applications are classified fully automatically at the DPMA. Furthermore, in 2016 the DPMA also initiated a project for the implementation of a central service for the prior art search in various data sources of the DPMA (e.g. electronic file, specialist databases, etc.). The new central service uses algorithms to improve textual similarity search.

For the future, the DPMA considers that AI could be of particular relevance in the following fields of application: (i) classification of applications, (ii) translation of applications, (iii) prior art search, (iv) image search and recognition (v) search in chemical formulas and sequence listings. This applies to patents and utility models as well as to trademarks and designs.

Best regards,

Gustav Schubert
Legal Advisor

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Section 4.3.3
International Industrial Property

German Patent and Trade Mark Office
80297 Munich
Germany

GERMANY

Electronic classification of patent and utility model applications at the DPMA

Patent applications are classified according to the International Patent Classification (IPC) at the German Patent and Trade Mark Office (DPMA).

In 2011 a tool for automated IPC classification was introduced at the DPMA as part of the Electronic Patent and Utility Model Management System (DPMApatente/gebrauchsmuster). This classifier, which is based on heuristic algorithms provides a preliminary assignment of an IPC to the incoming patent applications and thus helps to route them to the appropriate patent examiners. The main disadvantage of this black-box tool is that it is not flexible, cannot be parameterized and is not suitable to cover diverse use cases at the DPMA.

Therefore, a new automated patent classification tool was developed as part of the new Patent Search System. After evaluation of different technologies a methodology based on neural networks with "distributed word representations" was chosen. As a first step an automated categorization at IPC sub class level was analyzed with the quality measures "Top Prediction" and "Three Guesses". Experiments with different training sets consisting of selected publications of German patent applications, granted patents and utility models from the year 2010 to the end of the year 2015 were carried out. We obtained the best results from a training and test set consisting of approximately 350,000 documents of publications of patent applications and patent grants. In this case we measured Top Prediction of 81 % and Three Guesses of 89 %. Results deteriorated, however, when we included documents of utility models in the training set. We observed also that the distribution of training and test documents at IPC class level was not homogeneous. In some experiments we also considered the IPC Revision and could not find any significant effect on the statistical results. Furthermore, we carried out preliminary classification experiments at IPC sub group level and noted that training sets with better coverage at IPC sub group level will have to be provided.

The classifier implementation includes a pipeline mechanism with data preparation, training and evaluation. At each step parameters can be configured and partial results can be viewed thus providing flexibility and transparency of the whole classification process. The classifier can scale up regarding the IPC classification space and shows an acceptable performance of the training process. It is very fast at online classification of unknown texts.

The range of possible applications for the new classifier at the DPMA includes:
 Automated pre-classification of incoming patent applications. It will improve the distribution of patent applications among the patent examiners.

 Interactive classification. The classification tool will assist the patent examiners by providing several predictions at a given IPC level.

 Re-classification. The new classifier will support the introduction of new versions of the IPC.

GERMANY

 Continuous quality improvement of IPCs of prior art patent documents. A web-service built upon the classifier will provide on-the-fly IPC prediction for a given patent document part like the abstract, claims or description.

Future work on the project aims at improving the classification accuracy. A high quality standard of the training set shall be achieved by using more and better patent documents. We would like to provide classification depth at IPC sub group level for our use cases. Another goal is the support of multilingual patent documents beginning with English and French applications.

JAPAN

The Current State of JPO's Initiatives for Utilizing AI in its Operations

1. Overview

With a view of sophisticating and streamlining operations at the Japan Patent Office (JPO), the JPO in 2016 started studying ways that artificial intelligence (AI) can possibly be utilized in its operations. And, in April 2017, the JPO formulated and published an action plan for utilizing AI in its operations. This fiscal year, the JPO started an initiative to validate how AI can be utilized in six of its business operations. The six are: (1) responding to questions from users (by phone, etc.); (2) digitizing filing procedures; (3) assigning patent classifications; (4) prior art searches (support for formulating search terms and queries); (5) prior searches of figurative trademarks; and (6) assigning trademark classifications of designated goods and services.

It should be noted that "validate" means validating the technical accuracy of AI-based systems, but does not yet include any trials of actually using AI-based systems in its operations. Based on the results obtained from validation works in this fiscal year, the JPO plans to consider whether to continue the validation works in the next fiscal year and beyond and whether to start conducting trials.

2. Outline of Validation Works

As stated above, the JPO started validating its systems to verify possible uses for which AI can be implemented as a means of supporting the following business operations. The followings are functions and learning processes that the JPO plans to validate.

* Since we have just started validating our systems from this fiscal year, we have not gained any information yet on the reliability of AI-based systems that we are working to verify. (This excludes "(1) Responding to questions from users" stated below.)

Common Business Operations

(1) Responding to questions from users (by phone, e-mail etc.)

Functions:

- Support function for responding to questions (AI-based systems will suggest possible answers to the JPO staff responsible for responding to questions from users); and
- Automatic answering function (AI-based systems will answer questions submitted by e-mails, chat messages, or verbal messages).

Learning Process:

- Utilize past records of responses and various manuals.

Reliability: Accuracy of AI-bases systems

- The JPO conducted validating some of its support function for responding to questions in fiscal year 2016. (The scope of learning was limited to responding to questions related to only certain business operations.) The AI-based system achieved a top-5 accuracy rate of 80% (Top-5 accuracy rate means the rate at which the correct answer is among the 5 most likely answers suggested by the system).

JAPAN

(2) Digitizing filing procedures

Function:

- Convert image data of the paper filings into text data by using AI-based character-recognition function (which includes converting handwritten documents into text data).

Learning Process:

- Use image data of the past paper filings and their text data.

Business Operations on Patents

(3) Assigning patent classifications

Function:

- Function to assign patent classifications (Making suggestions for patent classifications (F-terms), and grounds for assigning these classifications).

Learning Process:

- Use text data of already filed documents, to which patent classifications were assigned.

(4) Prior art searches (Support for formulating search terms and queries)

Function:

- Suggest keywords and patent classifications, which should be included in search queries. (Closely related keywords and patent classifications are to be grouped together.)

Learning process:

- Use text data of examined patent documents and the retrieval history of search queries used in the examinations.

Business Operations on Trademarks

(5) Prior searches of figurative trademarks

Functions:

- Retrieve prior figurative trademarks by inputting image data of claimed figurative trademarks, which might be identical with, or similar to, the claimed trademarks; and
- Eliminate noise in search results based on the International Classification of the Figurative Elements of Marks or the Vienna Classification (so as to eliminate trademarks that are clearly dissimilar to claimed trademarks).

JAPAN

Learning process:

- Use the past results in prior searches of figurative trademarks.

(6) Assigning trademark classifications of designated goods and services

Functions:

- Assign tentative similar-group codes to unclear designated goods and services in trademark applications; and
- Check whether or not the fundamentals of applicants' designated goods and/or services are changed after amendments have been made to their trademark applications.

Learning process:

- Use reference materials, such as the Examination Guidelines for Similar Goods and Services (which include many examples of specific goods and/or services and their appropriate similar-group codes).

JORDAN

Dear Sir/ Madam

I'd like to inform you that after checking up with the Copyright Office at Department of the National Library of Jordan, the copyright office doesn't use any AI program or database in its work.

Best Regards

Ena'am Mutawe
Director of Public Relations
Department of the National Library

KINGDOM OF SAUDI ARABIA

Ref. No. 413/6/8/1789

Geneva, 15 January 2018

The Permanent Mission of the Kingdom of Saudi Arabia to the United Nations Office and other International Organizations at Geneva presents its compliments to The World Intellectual Property Organization (WIPO), and with reference to note C.8706 dated 11 October 2017 regarding the survey and request of contact information for consultation on the matter of application of artificial intelligence (AI) to the administration of IPOs, The permanent mission has the honor to inform the latter that the contact information for the aforementioned subject is as follow:

Patent Information Unit at King Abdulaziz City for Science and Technology:

Telephone: +966-4883555, Ext. 6245.

Email: spoit@kacst.edu.sa

The Permanent Mission of the Kingdom of Saudi Arabia avails itself of this opportunity to renew to The World Intellectual Property Organization (WIPO), the assurances of its highest consideration.

World Intellectual Property Organization
34, chemin des Colombettes
CH-1211 Geneva 20, Switzerland
Email: ai4ip@wipo.int

MEXICO

To whom may it concern,

Regarding the circular C.8706 dated on October 11, 2017, please find attached the answers of this Institute to the WIPO Survey on the Application of Artificial Intelligence (AI) to the Administration of IPOs.

Thank you in advance for your attention.

Kind regards

Fernando Portugal Pescador
Director Divisional de Relaciones Internacionales
Dirección Divisional de Relaciones Internacionales.
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IMPI
INSTITUTO MEXICANO
DE LA PROPIEDAD
INDUSTRIAL

MEXICO

ANNEXO

(a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)

Currently, IMPI does not have business solutions making use of AI and big data.

(b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

Currently, IMPI does not have AI systems in use.

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

IMPI does not have experience in this issue.

MOROCCO

ROYAUME DU MAROC

OFFICE MAROCAIN DE LA PROPRIETE
INDUSTRIELLE ET COMMERCIALE

OMPIC

المملكة المغربية

المــكتب المــغربــي
للملكية الصنــــاعية والتجـــارية

Réponses à l'enquête sur l'application de l'intelligence artificielle à l'administration des offices de propriété intellectuelle

a. Liste des solutions :

 Système de reconnaissance optique de caractères

 Solution décisionnelle pour le reporting

 Outil d'analyse cartographique

b. Description des systèmes d'intelligence artificielle et big data

 Système de reconnaissance optique de caractères:

Ce système s'appuie sur des procédés informatiques pour la traduction d'images en textes imprimés en se basant sur le moteur de reconnaissance ABBY. Ces procédés permettent de récupérer les informations depuis des fichiers PDF et les insérer dans les bases de données de l'OMPIC selon une structure bien définie (Template). Des règles de contrôle sont ensuite appliquées sur les données extraites pour s'assurer de leur exactitude. Les données incorrectes passent par le vidéo-codage.

 Solution décisionnelle pour le reporting :

Une solution décisionnelle, sous Qlikview, qui permet de gérer les méga données issues des différentes bases de données de l'OMPIC, quel que soit leur emplacement de stockage, et de créer une base de données statistique destinée au reporting et au contrôle qualité. Cette solution permet de générer de nouvelles vues des informations à la volée, et compresse les données et les conserve en mémoire, où elles sont disponibles pour une exploration immédiate par plusieurs utilisateurs, sans être limité par des chemins prédéfinis dans la hiérarchie ou des tableaux de bord préconfigurés.

 Outil d'analyse cartographique:

Un outil d'analyses cartographiques qui permet la recherche des brevets déposés dans le monde entier par domaine technologique, ou par mots clés. Cette recherche permet de ressortir toutes les informations ainsi que des analyses statistiques relatives aux brevets recherchés. Actuellement, l'OMPIC dispose de la solution Orbite Intelligence.

c. Retour d'expérience

 La reconnaissance optique de caractères a permis de réduire les délais de traitements relatifs à l'extraction des données gérées par l'OMPIC dans le cadre de ces activités et de baisser les coûts de la saisie manuelle de près de 1 millions de documents. Cette expérience positive est étendue au traitement des documents brevets.

MOROCCO

☐ La solution décisionnelle a répondu avec satisfaction aux besoins de l'OMPIC et ceux de ses clients. Fiable et facile d'utilisation, elle a permis d'automatiser les différents tableaux de bords de reporting et de les présenter sous forme de graphe et de tableau. Cet outil a été utilisé pour la création d'un baromètre de statistiques sur la propriété industrielle destiné au grand public et accessible via le lien : **www.barometreompic.ma.**

☐ L'outil d'analyse cartographique a été introduit pour le besoin du réseau TISC Maroc *"Technology and Innovation Support Centers"* pour les demandes de recherche de l'état de la technique et de l'antériorité des brevets. Depuis 2011, près de 800 demandes ont été traitées en utilisant cet outil qui a été perçu comme une grande valeur ajoutée par les membres du réseau dans leurs analyses.

MYANMAR

We are very glad that we received your invitation to participate in a survey on the application of Artificial Intelligence (AI) in the administration of Intellectual Property Offices (IPOs).

Now, we are trying to establish Intellectual Property System in our country, Myanmar. So, we are afraid to answer your survey questions such that

(a)   We haven't still yet any relevant business solutions
(b)   We haven't still yet any commercially available system or in-house development system
(c)   We haven't still yet any experiences and other sharing information with other IPOs

Best Regards.

Intellectual Property(IP) Department
Ministry of Education (Science and Technology)
Nay Pyi Taw, MYANMAR
contact: +95 67 404507,
ipsectionmost@gmail.com

NEW ZEALAND

With regard to the email request below to complete a survey on the application of Artificial Intelligence (AI) to the administration of IPOs, IPONZ responds as follows:

(a)   Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)

We have none at this time.

(b)   A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

N/A

(c)   Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

Our business plan for this year includes investigation into artificial intelligence and how it might be utilized in future IPONZ services.

Please confirm whether your require any additional information at this time.

We are very interested to learn what other Offices are planning and/or achieving in this evolving area, and eager to learn the results of your survey. Please keep us informed.

Many thanks and kind regards,

Tanya Carter
SENIOR STAKEHOLDER ENGAGEMENT ADVISOR
Telephone: +64 (0) 4 978 3679 | Mobile: +64 21 827 906

Intellectual Property Office of New Zealand, Market Services Group
Ministry of Business, Innovation and Employment

NORWAY

Norwegian Industrial Property office would like to participate in the survey.
Our answers are given under the original questions below.

(a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)
   ☐ Trademark image search

(b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)
   ☐ Acsepto for trademark version 10, by Sword-Group, France

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)
   ☐ Very good experience with current image search, where traditional search is conducted (without AI), but where the search results (hit list) is prioritized based on AI assisted search on image property coding.

   o AI technology used is commercially available trained algorithms for coding, and trained search algorithms for coding of images.

   ☐ Comparisons with other solutions, like EUIPOs, demonstrated that the there are differences, mostly depending on the image coding strategy, the amounts of data. While the most "similar" trademarks often was the same, there very larger differences where both solutions reported lower degree of similarity.

   o This shows that a mix of strategies, training with larger amounts of data, and a user assisted search setup, or a setup covering more different strategy would give even better results.

Yours sincerely,

Jens Petter Sollie
IPR System manager
Phone +47 2238 755,
Mobile +47 957 85485
Email jps@patentstyret.no

REPUBLIC OF KOREA

Current status and activities regarding the use of Artificial Intelligence (AI) and Big Data in IP Administration by Korean Intellectual Property Office (KIPO)

1. Current status and activities regarding the use of AI and Big Data in IP Administration

For the use of Artificial Intelligence (AI) in intellectual property (IP), the Korean Intellectual Property Office (KIPO) is working to build a patent knowledge base for AI learning and cooperate on research with the Korean Electronics and Telecommunications Research Institute (ETRI) for applying their developed AI system in IP administration.

The Korean Intellectual Property Office (KIPO) has been engaged in several activities to advance into the area of AI and Big Data. In December 2016, KIPO participated in a project to create infrastructure for the AI industry and is planning to build a knowledge base on patents.

A database using Patent Publication Data on the IPC Section H will be established for machine learning. The database will be compiled with 1 hundred thousand terminologies of patent technology and 1 million pieces of patent language analysis and drawing tagging information.

In April 2017, KIPO signed an MOU concerning AI with ETRI. Collaborating together, a pilot model will be made for intelligent patent search as well as AI-assisted customer service.

To enhance the quality of prior art search, KIPO is moving away from keyword search to a search system based on syntax and semantics. Presently, claims in patent documentation are being used to analyze patent language and to study semantic patterns among claims. A pilot model is hoped to be finished by 2019.

Furthermore, KIPO plans to develop and refine a pilot model of an AI patent customer service system based on text and voice recognition over the next three years.

RUSSIAN FEDERATION

Unofficial translation

Director General
World Intellectual Property
Organization

Mr. Fransis Gurry

Dear Mr. Gurry,

In response to your letter No. C. 8706 dated 11.10.2017, Rospatent hereby submits the information relating to the survey on the application of artificial intelligence (enclosed hereto).

Rospatent supports your suggestion announced during the 57th series of the Assemblies of the World Intellectual Property Organization, on the necessity of proactive usage of artificial intelligence in the IP field. We believe that it is very important to develop a distribution mechanism for the information on the activities of IP offices related to implementation of respective methods.

Currently, the Federal Institute of Industrial Property (FIPS) conducts research on application of artificial intelligence. Within the first half of year 2018, they will obtain the first results of using artificial neural networks and methods of deep learning for increasing the efficiency of similarity search at examination of inventions and utility models. Search quality criteria that consider peculiarities of searching tasks for inventions examination developed by FIPS are used in the mentioned researches.

Dear Mr. Gurry, Rospatent is highly interested in developing cooperation with WIPO and other IP offices in this promising field. We look forward to continuing our cooperation on this issue.

Encl.: on 2 sheets

Head of Rospatent
G.Ivliev

RUSSIAN FEDERATION

The information about using artificial intelligence Methods in the IP field

(a)   Nowadays, the Federal Institute of Industrial Property (FIPS) conducts research on application of artificial intelligence methods in the IP field. We believe that the most effective way is to use artificial intelligence facilities and methods in information retrieval at examination of inventions and utility models. In the first half of year 2018, the first results of using artificial neural networks and methods of deep learning for increasing the efficiency of similarity search at examination of inventions and utility models will be obtained.

(b)   (c) We have already received some interesting results in developing "similar" documents search functionality based on co-referential links, elements of synonymy and semantic links metering. Elaboration of criteria for similarity search quality is supposed to be one of the important results, which allowed collating and improving efficiency of the researches. However, we believe that the potential of the functionality is significantly higher, and it is not exploited sufficiently.

Currently we study the possibility of significant improvement of "similar" documents search based on technologies of artificial intelligence systems, namely neural network technologies.

As for search of similar patents, supervised-learning convolutional neural network algorithm is planned to be used.

A convolutional neural network consists of two convolutional layers. The first one convolutes words' vector data model into sentence's vector data model. The second one convolutes sentences' vector data model into a document's vector data model. Method of k-max pooling is applied to each layer to get the constrained set of features' maximum values. Similarity search quality criterion was chosen as a minimizing function. It considers special features of searching tasks at examination of inventions.

Training stage consists of the following procedures:

1)   Generation of a list of pairs "a patent – a similar patent" (according to the data of field 56) as positive examples and pairs "a patent – a dissimilar patent" as negative examples;

2)   Generation of positive and negative examples batches;

3)   Obtaining of lemmas vector data model in patent collection based on distributional semantics technologies (Word2Vec, GloVe);

4)   Convolutional neural network training with L2-normalization of document vector data model.

RUSSIAN FEDERATION

Process of similar documents searching involves neural network's feed-forward pass for this document and obtaining its vector data model, which is compared with other documents' vectors in collection as per cosine measure.

Global experience of using such approach for analysis of texts and images proved its high efficiency. Our first experiments also confirm it. Existing publications both in Russia and abroad demonstrate that efficiency of the approach critically depends on the network complexity, i.e. on the amount of neurons in input layer and the amount of layers (and hence, on computing resource), and on amount of available training examples. At that, currently there are no approaches applicable for estimation of minimum essential resources. In our case, first experiments offer the prospect of getting the result that allows finding document references that can be used at examination as to novelty in top 10 search results with a probability of 60% while searching for similar documents.

SERBIA

Thank you for starting AI technology information sharing initiative.
Here is the initial survey response to the letter received from WIPO Director General to the IPO-RS, dated October 11, 2017. We can provide more details later.

Intellectual Property Office of the Republic of Serbia (IPO-RS) is willing to participate in the knowledge and tools dissemination for the implementation of AI technologies to IP administration. We have ideas how to involve these technologies, and have capacity to produce program prototypes and test available programs.

We already use available online tools for classification, mark logo image search and machine translation.

There is a need to customize these and similar tools for local needs and Serbian language.

IPO-RS uses business solutions software provided by WIPO, such as WIPO IPAS, WIPO Publish, WIPO Scan and Patent OCR platform.
IPO-RS has significant in-house software development achievements, some of which are shared with other IP offices in the region with WIPO support.
So far, most of these programs do not include AI and big data concepts. One internal system in use, which can include AI elements, is WIPO Patent OCR platform.
Two IT engineers from IPO-RS are engaged as WIPO regional experts for supporting WIPO business solutions for IPOs, and can support future AI solutions as well.

The response to the required information inquiry:

(a) Any relevant business solutions making use of AI and big data -
WIPO Patent OCR Proofreading Platform

(b) A description of specific AI systems in use -
WIPO Patent OCR Proofreading Platform
WIPO OCR platform has potential capabilities of machine learning for improved OCR proofreading. We are planning to take advantage of machine learning during manual OCR proofreading, in order to enhance dictionaries and design specific processing rules for patent documents in the Serbian language.

(c) Experience to share with other IPOs
-OCR proofreading: Due to limited local language resources in ABBY OCR (inadequate dictionary and grammar rules), machine training still adds minor value to OCR proofreading quality. The major problem which degrades OCR correctness in our experience is the presence of multiple scripts used in our documents (Serbian Cyrillic, Serbian Latin, English, Chemical and math formulas).

-In the scope of EPO Patent machine translation project, IPO-RS provided corpora of full-text patent specification document pairs (Serbian/English) for specific machine translation learning purpose. The specific machine translation tool for Serbian language in Espacenet database still does not produce satisfactory results

SERBIA

Please advise on further steps and related formalities for this matter.
We wish you all the best in the New Year!

Aleksej Peric

Aleksej Perić, Senior Counsellor
Information System Department
Intellectual Property Office
Kneginje Ljubice 5, 11 000 Belgrade, Republic of Serbia
T: + 381 (11) 20 25 854
E: aperic@zis.gov.rs

SINGAPORE

Business Solutions that potentially is able to adopt AI.

1. Image Search for Trademarks

Allows customers and examiners to search by providing a search image versus the traditional keyword search. Utilizes artificial intelligence to enhance processes such as:

a. recognizing non-abstract elements which enables the finding of conceptually similar yet visually dissimilar marks,

b. finding of conceptually similar words and devices from words of different languages,

c. assisting in mark segmentation such that individual elements within a composite mark could also be searched for.

IPOS has completed a POC and are currently evaluating our options with a view to implementation in 2018.

2. Trade Marks Class Recommendation Tool

Utilizes Natural Language Processing to automatically recommend relevant classes for a trade mark application, helping applicants choose correct classes and thus reducing the rejection rate due to incorrect class selection. This help saves applicants costs and decreases turnaround time by reducing resubmissions.

Also automatically selects the registered text descriptions that are most similar to each text description in a trade mark application. This helps officers speed up the examination step of similarity to other trademarks and thus reduce turnaround time.

IPOS has partnered with A*STAR, a local Research Institution to implement this system. Projected completion date is mid-2019.

3. Trade Marks Distinctiveness Checker

Utilizes machine learning to automatically measure the distinctiveness of a given word mark and also to suggest evidence for the measurement. This helps officers speed up the examination step of distinctiveness and thus reduces turnaround time.

The automatic measurement of this task can be also used by applicants, in order to reduce rejection rate due to undistinctive word marks.

IPOS has partnered with A*STAR, a local Research Institution to implement this system. Projected completion date is mid-2019.

SINGAPORE

4. Trade Marks Outcome Simulator (Trade Marks Image Search + Class Recommendation Tool + Distinctiveness Checker)

Provides savings of about 5,000 examiner man hours annually at current rate of filing and would increase proportionately with filing rates.

IPOS plans to implement this by end-2019.

5. Patents auto checker

Utilizes Natural Language Processing (NLP) and other machine learning technologies to perform formalities check automatically.

IPOS is currently exploring the feasibility of implementation of this system.

6. Patents auto classification tool

Utilizes NLP to understand Patent documents and automatically sort them in the relevant specialization, saving the effort of the Patent admin team.

IPOS is currently exploring the feasibility of implementation of this system.

7. Image Search for Designs

Allows customers and examiners to search a series of images by providing a search image.

IPOS is currently exploring the feasibility of implementation of this system.

SLOVAK REPUBLIC

Dear Sir/Madam,

With respect to the WIPO Survey on Artificial Intelligence (AI) from October 11, 2017 (letter C.8705) I regret to inform you that the Industrial Property Office of the Slovak Republic (thereinafter „the Office") currently does not use any business solution involving AI.

With kind regards,

Miroslav STANČÍK
Kancelária predsedu a medzinárodných vzťahov
Úrad priemyselného vlastníctva SR

President´s Office and International Affairs
Industrial Property Office
Svermova 43
974 04 Banska Bystrica
Slovak Republic

INTELLECTUAL PROPERTY - THE UNIQUE DESERVES PROTECTION!

INDUSTRIAL PROPERTY OFFICE OF THE SLOVAK REPUBLIC

VPI VISEGRAD PATENT INSTITUTE BRANCH OFFICE

Švermova 43
974 04 Banská Bystrica 4
Slovak Republic
www.upv.sk
www.patentovat.sk

SWEDEN

Response to survey on the application of Artificial Intelligence (AI) in the administration of IPOs

Respondent: Swedish Patent and Registration Office (PRV)

The Swedish Patent and registration offices answers to the survey is indicated in red below:

(a) Any relevant business solution making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)

PRV use the machine translation services provided by EPO in EpoQueNet and Espacenet.

(b) A description of specific AI systems in use (such as the name of commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

See above. The PRV has no in -house developed system using AI.

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

Due to lack of resources and high workload PRV has limited possibilities to develop AI-services.

SWITZERLAND

Dear Sir/Madam,

Please find attached Switzerland's answers to the AI survey. Our apologies for the late replay.

We understand that the results of this survey will also inform discussions during May's meeting of IPOs on ICT Strategies and AI. We have not yet received a formal invitation for registration but look already now forward to participating in this event.

Should you need any further information than contained in our answers please don't hesitate to contact us.

Best regards,
Ursula Siegfried

Ursula Siegfried
Legal Advisor
Abteilung Recht und Internationales

SWITZERLAND

Survey on the application of Artificial Intelligence (AI) in the administration of Intellectual Property Offices

Answers Switzerland

IGE/hju, 01.02.2018

a)   **Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)**

The IPI uses two types of AI: On the one hand, we use classical Rule based AI for process automation. We automate for instance applications for rulings / decisions with fees or deadlines with a rule based AI. On the other hand, the second type AI we use is self-learning. We are just about to launch self-learning AI for document classification, and in the near future for information extraction. Document classification is in the first step used for input management, and information extraction will be used for advanced corporate search.

b)   **A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)**

For the rule based AI we use Visual Rules and Camunda BPM. The actual Training is based on predefined Rules in combination with Processes.

-   Bosch SI Visual Rules https://www.bosch-si.com/de/bpm-und-brm/aktuelles/news/visual-rules-brm-release-70.html

-   Camunda BPM https://camunda.com/

For the self-learning AI we continuously train the AI with manually classified documents. We automatically analyse the quality of results from the self-learning AI and then decide if we ask for manual confirmation or not. The manual confirmation is then be used to enhance the training set for the AI.

-   ABBYY Smart Classifier https://www.abbyy.com/en-eu/smartclassifier/

-   ABBY InfoExtractor https://www.abbyy.com/en-eu/infoextractor/

c)   **Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)**

Rule based process automatism has the highest potential in reduction of repetitive administrative work. Basically, all decisions triggered by fees or deadlines, including document creation, are possibly automatized and the automatism works reliable. Operations and the operational processes are critical for success. We have central real time monitoring and we strictly use Business Process Modeling Notation (BPMN) Processes for automatism.

We have less experience with self-learning AI. Yet we came to the conclusion that only in combination with a rule based AI, we can achieve business value added. The main challenge for us is the probability

SWITZERLAND

of correctness of the AI results. False results may lead to complex error scenarios with need for compensation. For this reason, we validate AI results from the self-learning AI with a rule based AI.

The main challenge we have identified in using AI, is that the IT needs to understand business processes, and that business must understand IT technologies. The work of an IPO has in general become more IT related. Therefore, professional interaction design is a key success factor.

SYRIAN ARAB REPUBLIC

I have the pleasure to participate in a survey on the application of artificial intelligence (AI) in the administration of intellectual property offices (IPOs). The following are several suggestions that can enrich the study

1- Create a static form for patent formulation, preferably typed by a person in charge who is an expert in of the drafting of patents in English.

2- Take advantage of the successful experience of scientific journals from the famous international publishing houses such as IEEE, Springer and ELsevier. Where that when an article is sent to one of those journals, in order to determine the proportion of copy content from previously published scientific articles on the world level. For that there is a special program to study any article, where the official will give all articles associated with it, on the level of the text, images or figures, and then return the correspondence matching rate. With such a program, as well as the presence of a data base that includes all previous patents, can obtain all the patents that could be relevant to the patent to be examined the text and pictures and schemes. Thus, the final decision will be based on the limited relevant patent group.

3- Adopt one of the methods of Data Mining, Expert Systems, Big Data and Decision-making Systems, for creating a new software, which is able to assist the examiner in finding all patents relevant to the examined patent.

4- Based on the machine learning techniques can build an intelligent system, which will help the examiners for determine the accepted climes and rejected ones, according to standard factors which are identified in the first learning phase based on how the EXAMINERS deals with allegations of rejection and acceptance in all previous Patents.

Nesreen Akel - Engineer
Head of Patent Section
Industrial Property Protection Directorate Ministry Of Internal Trade and Consumer Protection -SYRIA

TOGO

MINISTERE DE L'INDUSTRIE
ET DU TOURISME
....

INSTITUT NATIONAL DE LA PROPRIETE
INDUSTRIELLE ET DE LA TECHNOLOGIE
(INPIT)

N° 891 /MITo/INPIT

REPUBLIQUE TOGOLAISE
Travail- Liberté-Patrie
....

Lomé, le 13 DEC 2017

LE MINISTRE

à

Monsieur le Directeur général
de l'Organisation mondiale de
la propriété intellectuelle (OMPI)
34, Chemin des Colombettes
1211 Genève, SUISSE

Monsieur le Directeur général,

Faisant suite à votre lettre C. 8706 du 11 octobre 2017 qui invite notre pays à fournir au secrétariat de l'Organisation mondiale de la propriété intellectuelle (OMPI), les informations relatives à l'application de l'intelligence artificielle dans les offices de propriété intellectuelle,

J'ai l'honneur de porter à votre connaissance qu'à ce jour, l'Institut national de la propriété industrielle et de la technologie (INPIT) n'utilise pas encore l'intelligence artificielle et des mégas données dans l'administration de la propriété industrielle.

Veuillez agréer, Monsieur le Directeur général, l'assurance de ma considération distinguée.

Yaovi Attigbé IHOU

UNITED KINGDOM

WIPO Circular C.8706: Survey on the application of Artificial Intelligence (AI) to the administration of IPOs

Response from the UK Intellectual Property Office (UKIPO)

Background

The UKIPO is undertaking a major portfolio of work to transform our digital systems, and we plan to make more use of AI and big data in the future, but considerations are at a very early stage. While we have limited experience to share with other IPOs, we would be interested in the experiences of other IPOs, would be grateful to be kept informed of developments, and would be keen to actively contribute to deliberations on the topic organized by WIPO. Information concerning specific applications of AI are outlined below.

Machine translation

Patent examiners are trained to use the EPO's Patent Translate tool, and may use publicly available machine translation tools where appropriate.

Allocation/classification of patent application files

We have conducted small-scale trials of automated tools, both for allocating patent applications to examining groups based on areas of expertise, and for applying classifications to applications. So far, results would seem to suggest that commercially available tools are not mature enough and cannot be relied upon to correctly classify the application on all occasions without human intervention, but could potentially be used to aid the examiner during the classification process by suggesting possible classification terms for ratification by the examiner. When used in the allocation process, results seem to suggest that existing tools could not match the 80% manual success rate currently achieved by human allocators, but again could be used to aid the allocators by suggesting possible destinations for the application which alone might speed up the allocation process. However, we are currently looking for new tools in this area which could be deployed as part of a redesigned workflow process in future.

Patent search tools

We have also conducted a trial of Derwent Innovation. This patent search tool comprises, amongst other features, a semantic/smart search functionality that allows large amounts of plain text (e.g. claims, description) to be used as a search input. The search tool also has the ability to search non-patent literature alongside patent documents. Further features include the ability to manually set weightings of individual search terms in order to rank results in an answer set.

UNITED STATES OF AMERICA

USPTO Response to AI Survey

You are kindly invited to provide the following information to the Secretariat of WIPO:

(a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)

USPTO has established an advanced analytics program that combines big data/ big data reservoir (BDR), machine learning, and artificial intelligence (AI) to enhance understanding of USPTO policies, processes, and workflows. AI is basically defined as cognitive assistance using feedback from human users where the AI is capable machine learning (deep/neural) to provide the most useful and relevant information to determine patentability by an examiner during prosecution.

The program will enable detailed textual analysis of patent application data and related office actions, allowing data scientists to analyze data from patent application through post-grant. This analytics platform with textual information from patent applications and subsequent Office actions. With this data, data scientists will be able to conduct analyses on the entire patent prosecution history – from initial filing all the way through post-grant. Other notable work has focused on improving the USPTO's application programming interfaces (APIs) to provide the public with better access to USPTO data.

In particular, Patent Operations teams have requested an Office Action API listing summation data of each office action including the rejection type by claim and reference(s) used. This will enable Patent Operations to investigate ways to complete Examiner Time Analysis and citation usage, in particular, to harmonize US office actions to PCT using the citation portion of the API with enriched citations.

Another example, the program used machine learning and modeling of the Master Review Form using data science techniques to provide new insights and prototype dashboards as requested.

In other areas such as searching, the USPTO is delivering a proof of concept, Sigma, which uses machine learning/AI algorithms to search whole documents against a corpus of documents. For this version of Sigma, patent applications were searched against granted patents and pre-grant publications (US only).

This program also include improvements for Trademarks Operations in the following areas: 1) developing a quality review smart form with analytics; 2) ingesting office actions on the BDR with advanced analytics including usage

UNITED STATES OF AMERICA

and descriptive statistics; and 3) determining the efficacy of deep machine learning for image searching for Trademarks.

We are not currently using AI technology on translations; however, deep machine learning Quality Chat Bots are being researched to provide ready access to "concept questioning" (instead of keyword) to the USPTO Manual Patent of Examination of Procedures (MPEP) and other claim analytics and classification analytics using algorithms and claim language to better understand trending of claim language and classification.

(b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

The program is in-house development using open source technology (Java and Python) for which the USPTO customizes per application per system. For example the big data technology platform comprises of NIFI, Hive, Spark, Elastic Search and Hadoop Distributed File System (HDFS) Storage. The USPTO does not endorse any particular technology but instead has decided to use what best meets our needs and on funding.

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

The strategy of building by "use cases" to validate the value of data science with patent and trademark prosecution with feedback mechanisms by the users (examiners and quality experts) to train the models is very critical. Also, the strategy of cognitive assistance to the examine based on using test groups end users and using open source (to custom code from known building blocks) to build from within organization to validate the results. Knowledge management is critical to ensure the quality of the results and AI that is consist and in constant communication to the executives to drive meaning, measurable metrics based decision making from data that improves performance management of the agency.

URUGUAY

ASUNTO: OMPI - ENCUESTA SOBRE INTELIGENCIA ARTIFICIAL

Se transmite en anexo nota enviada por el Director General de la OMPI invitando a los Miembros a participar en una encuesta sobre la aplicación de la Inteligencia Artificial en la administración de las Oficinas de Propiedad Intelectual (OPI).

El objetivo de dicha encuesta es facilitar datos a la Secretaria de la OMPI con miras a establecer las bases para un primer estudio que permita a las Oficinas de Propiedad Intelectual (OPI) mantenerse al día en cuanto al desarrollo de nuevas tecnologías. Dicha información deberá ser enviada por e-mail (ai4ip@wipo.int) a la Secretaria de la OMPI antes del 31 de diciembre 2017.

Atentos saludos,

Dirección General para Asuntos Económicos Internacionales
Dirección de Organismos Internacionales Económicos
Ministerio de Relaciones Exteriores - Uruguay
Colonia 1206 / 4º piso
Montevideo 11100

URUGUAY

Annexo

(a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)
Notifications System (in-house development) In progress

(b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)
Notifications System (in-house development) Our online filing system works along with the notification system. In the case of the latter, our Office is in development stages of a more sophisticated algorithm that intends to learn when a particular user is no longer using the system or has not been using it for a while. In those cases, the idea is to put notice in the corresponding area of the Office so that other notification efforts could be started. Considering that the notification system is properly backed up with the appropriated laws and decrees, the Office could rest all efforts in it and consider that an event is notified when the corresponding amount of days went by without notice from the owner. Our idea is that the Office could work along with the owner, trying to do its best to achieve a good resolution for a specific application and therefore for the owner. The algorithm would work in different stages.   - Trying to keep alive the account sending emails, and test notifications. This way we can keep the application owner accustomed with system.   - Sending polls to users, asking if the system could be improved in any way. The idea here is not only get a feedback from the user, but also the same point of the previous item.   - Asking for personal information changes (email, phone, and representative). Usually the user forgets to change his/her personal information on every system he has an account on. This way we may catch any changes before it's needed, but also we could manage to keep the user in touch and using the system.

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)
N/A

VENEZUELA

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N° 0599

La Misión Permanente de la República Bolivariana de Venezuela ante la Oficina de las Naciones Unidas y demos Organismos Internacionales con sede en Ginebra, saluda atentamente a la Honorable Secretaria de la Organización Mundial de la Propiedad Intelectual- OMPI, en ocasión de hacer referencia a la Encuesta sobre Aplicación de la Inteligencia Artificial en las Oficinas de Propiedad Intelectual.

La Misión Permanente de la República Bolivariana de Venezuela tiene a bien remitir, en anexo, la respuesta del Servicio Autónomo de la Propiedad Intelectual- SAPI, de nuestro País.

La Misión Permanente de la República Bolivariana de Venezuela ante la Oficina de las Naciones Unidas y demos Organismos Internacionales con sede en Ginebra se vale de la ocasión para reiterar a la Honorable Secretaria de la Organización Mundial de la Propiedad Intelectual- OMPI las seguridades de su distinguida consideración.

VENEZUELA

Gobierno Bolivariano
De Venezuela

Misión Permanente de la República Bolivariana de Venezuela ante la Oficina de las Naciones Unidas y demás Organismos Internacionales en Ginebra

Respuesta del Servicio Autónomo de la Propiedad Intelectual-SAPI en relación a la Encuesta relacionada con la Aplicación de la Inteligencia Artificial en las Oficinas de Propiedad Intelectual; propuesta por la Organización Mundial de la Propiedad Intelectual-OMPI

ENCUESTA

a) Toda solución operativa en la que se utilice la inteligencia artificial y la inteligencia de datos (clasificación de archivos, de solicitudes búsqueda de imágenes de marcas, traducción automática, etc.)

> Actualmente en nuestro organismo no se aplica este tipo de tecnología. No contamos con sistemas que imiten las funciones "cognitivas" de la mente humane, como "aprender y "resolver problemas"; ni con máquinas que tengan la capacidad de percibir su entorno y llevar a cabo acciones que maximicen sus posibilidades de éxito en algún objetivo o tares.

> Los Sistemas que apoyan, simplifican y agilizan los procedimientos de nuestra institución, se basan en sistemas de "tecnología programable" donde se trasfieren tareas de producción, realizadas habitualmente por operadores humanos, a un conjunto de elementos tecnológicos.

b) Descripción de sistemas específicos de inteligencia artificial que se utilice (como Hombre de un Sistema disponible a nivel comercial o de un Sistema que haya desarrollado a nivel interno, una descripción de las funciones, los datos utilizados pare la formación del sistema de inteligencia artificial, etc.)

> Ninguno

c) Experiencia y otra información útil que pueda intercambiarse con otras oficinas de PI (fiabilidad, interfaz humana, posibles repercusiones en el trabajo, enseñanzas extraídas, entre otras).

> Ninguna

(ARIPO) African Regional Intellectual Property Organization

I wish to respond to WIPO circular **C.8706** relating to a survey on the application of Artificial Intelligence (AI) to the administration of IPOs as follows:

(a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)
ARIPO currently has no business solutions making use of AI and big data

(b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)
N/A

(c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)
The organization has not yet implemented a business solution making use of AI and big data but has implemented an IP administration system. The system has automated the whole IP administration cycle from receipt of applications up to maintenance, payment and granting.

(d) Contact person(s) for further consultation on this matter (name, title, and e-mail address).

Mr. Grey Njowola
Head of ICT
gnjowola@aripo.org

Regards

Mr. John KABARE
Intellectual Property Operations Executive

(EPO) European Patent Office

PD51 European and International Co-operation D512 International Co-operation

WIPO Survey on the application of Artificial Intelligence (AI) in the administration of Intellectual Property Offices (IPOs)

In reply to WIPO C. 8706 of 11 October 2017, please find below the EPO's contribution for your attention.

(a)   Any relevant business solution making use of AI and big data (such as classification of applications files, image search of trademarks, machine translation, etc.)

EPO has been active in developing business solutions using Machine Learning and "Artificial Intelligence" in the following areas at various degrees of implementation:

• Automatic Pre-classification of incoming patent applications for allocation to corresponding units in charge of search and examination
• Automatic Classification of patent documents according to CPC scheme

- Automatic Re-classification of patent documents according to changes in CPC scheme
- Automatic Search of prior art for incoming patent applications
- Automatic generation of queries
- Automatic annotation of patent literature
- Automatic detection of problem/solution in patent document
- Automatic detection of Exclusion from patentability
- Automatic translation of patent document
- Identification of migration/penetration trends of specific technologies (Computer Implemented Invention) in other technology sectors
- Automatic Figure and Image search for patent drawings

(b)   A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

Through its DataScience team, the EPO is mainly developing its own Artificial Intelligence systems (respectively Machine Learning models) based on open source software libraries that are fit for purpose. Therefore the EPO is in the unique position to combine its DataScience team`s expertise with an unmatched business understanding through our examiners and a most valuable collection of data; i.e. historical saved search data and, of course, the EPO prior art corpus. The EPO also makes use of commercial products in the automatic annotation area through software providers in different projects. The EPO uses Patent Translate in the area of Machine Translation but is also developing its own machine learned translation. The EPO has generated its own reference data (gold standards) and system for measuring the performance of automated search tools. More specifically, this is supported by a benchmarking and evaluation framework to measure the benefit of automation improvements in search and a data science environment to analyze and prototype machine learning and data processing solutions. The EPO has developed a Patent Document Model (PDM) and its implementation in the

(EPO) European Patent Office

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Knowledge and Information Management Environment (KIME). Together they enable an enrichment oriented management of patent and other data for Machine Learning purposes.

(c)   Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

The EPO does not consider personal anecdotal evidence and uses curated gold standards. Citation, classification, and categorization data was generated by thousands of highly skilled experts in decades of work. Frequently, generating the ground truth is the most labour intensive step when using machine learning. Development necessitates specialists to avoid obvious mistakes. The EPO is in a position to share its expertise on how to evaluate tools that are either in-house developments or external buy-ins. For both scenarios a deep understanding of how the evaluation is done is crucial for the success of the tool. There are many promises and expectations in the area of Artificial Intelligence and Machine Learning but small errors in the training and subsequently the evaluation can have a disastrous impact once a badly trained system goes live.

(EUIPO) European Union Intellectual Property Office

Madam,
Sir,

Please find hereinafter the contribution by the European Union Intellectual Property Office with regard to the survey on the application of Artificial Intelligence (AI) in the administration of Intellectual Property Offices (IPOs).

a) Any relevant business solutions making use of AI and big data (such as classification of application files, image search of trademarks, machine translation, etc.)

Support for examiners, image search

b) A description of specific AI systems in use (such as the name of a commercially available system or an in-house development system, a description of functions, data used to train the AI system, etc.)

TMVision, Babelscape, Microsoft

c) Experience and other useful information to share with other IPOs (reliability, human interface, any impact on the work, lessons learned, etc.)

Most of the solutions are only used by internal examiners; image search is available in our Website

With our apologies for the late reply,

Best regards,

Nestor MARTINEZ-AGUADO
Second National Expert
International Cooperation and Legal Affairs Department
International Cooperation Service
European Union Intellectual Property Office
www.euipo.europa.eu

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