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WIPO CONVERSATION ON INTELLECTUAL PROPERTY (IP) AND FRONTIER TECHNOLOGIES

Sixth Session
Geneva, September 21 and 22, 2022

SUMMARY OF THE SIXTH SESSION

prepared by the International Bureau of WIPO

INTRODUCTION

1.   The WIPO Conversation on IP and Frontier Technologies is a leading global forum to facilitate discussion and share and build knowledge amongst all stakeholders on the impact of frontier technologies, including artificial intelligence (AI), on IP.

2.   The series of Conversations started in 2019, intending to support well-informed policy choices in an era of growing digitalization and the rise of disruptive new technologies that are reshaping our economies and societies. Since then, the WIPO Conversation has provided an open, inclusive forum for a wide set of stakeholders to discuss frontier technologies and IP. Past sessions have attracted more than 2,000 attendees from over 130 countries from government, academia, IP professionals and the private sector.

3.   The sixth session of the WIPO Conversation focused on AI inventions. While there are many current discussions about IP and AI inventions, it is important to carefully define what is meant by an AI invention. The term can refer to novel AI models, the use of AI as part of inventions (AI-based inventions), or the use of AI as a tool in the inventive process (AI-assisted inventions). There are also considerable debates around AI autonomously generated inventions. Each different type of AI invention has different IP questions attached to it. The sixth session of the WIPO Conversation sought to raise awareness of the need to have clear definitions and to assist policymakers to understand the relevant IP scenarios.

STRUCTURE OF THE SIXTH SESSION

4.   The sixth session of the WIPO Conversation took place on September 21 and 22, 2022, in a hybrid format.[1] Some 772 people attended the session from over 107 countries, reflecting the growing interest and importance of the topic.

5.   Day 1 of the session set the scene for discussion by providing a primer into AI technology and patenting trends (panel 1), illustrative stories from AI innovators (panel 2), and a framework for the patenting questions raised by different classes of AI innovations (panels 3 and 4).[2]

6.   Day 2 featured a panel of IP professionals and attorneys giving their views on the most pressing questions they encounter in their practice (panel 5). The remaining part of Day 2 centered on sharing information, practices, studies, consultations, and guides between IP Offices (IPOs) and Member States and provided an open floor for all participants to share opinions and views. At the start of the morning and afternoon sharing sessions, short presentations about fostering an AI ecosystem that supports local innovation and the state of play in the patent system as it relates to AI set the scene for the discussions.

OPENING

7.   The session was chaired by Mr. François Rivasseau, WIPO Senior Consultant, Technology & Diplomacy. WIPO Assistant Director General, Mr. Ken-Ichiro Natsume (Infrastructure and Platforms Sector), opened the session of the WIPO Conversation by underlining the promises of AI against the backdrop of rapid technological changes and the importance of the IP system to continue fostering innovation and being the benefit of IP to innovators everywhere.

8.   Mr. Natsume described how improvements in computing power, data availability, and algorithmic models are fueling AI innovations. Consequently, AI has become a general-purpose

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[1] Videos on demand are available at
https://webcast.wipo.int/search/meetings?search_query=Sixth%20Conversation%20Frontier%20Technologies
[2] See the agenda for further details at http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=587136

technology across many areas of life, including manufacturing, agriculture, and health, with growing development and economic growth opportunities. AI innovations, he added, also hold one of the keys to finding solutions to some of our most pressing global issues.

9.   The AI market, Mr. Natsume said, is expected to grow to USD 191 billion in 2024, while patent applications in the AI field have increased a staggering 718 percent between 2016 and 2022.

10.   He emphasized the pivotal role of the global IP ecosystem in fostering AI innovation and its immense economic opportunity. He also highlighted the many questions generated for IP, particularly patents, by the rise of AI, including disclosure, inventorship, and inventive step.

11.   The sixth session of the WIPO Conversation aims to connect policymakers to innovators on the ground, to better understand their needs and help them further invent for growth and development, Mr. Natsume explained, underlining WIPO's goal to build an inclusive IP ecosystem.

PANEL 1: AI PRIMER – AI TECHNOLOGY, MARKET, AND PATENT TRENDS

12.   Panel 1, moderated by Mr. Jibu Elias, Head of Content and Research, National AI Portal, Government of India, provided a foundation for discussion with an overview of the AI ecosystem, its main actors, its part in digital transformation, and trends in patenting behaviors. The panel also discussed the definition of AI, the interplay between software, hardware, and data, and current and future AI applications. It set the scene for the remaining panels and sharing sessions.

13.   Given the inherently technical nature of AI, stakeholders need to have a fundamental understanding of the AI ecosystem and the different players in the AI field, of the current capabilities of AI technology, the use of AI, and, particularly relevant in the IP field, the current level of AI autonomy. Similarly, while AI is perceived as key for future innovation, patenting trends may provide a fuller picture and inform later discussions.

AI Ecosystem

14.   Mr. Elias remarked on the lack of a consistent definition of an AI ecosystem. He suggested two perspectives: the development ecosystem, including hardware, machine learning, and robotics, and the adoption ecosystem, which requires more knowledge-based skills, such as the digital capacity to handle and exploit data. He underlined the growing role of AI in India, with over 50% of Indian startups using AI, and India's rising importance on the global AI scene.

15.   National AI ecosystems are not all driven by the same actors, according to Ms. Kate Kallot, co-Founder and President of Mara Foundation in Kenya. The AI ecosystem in the United States is driven by big tech companies, in Europe by data and privacy, and in Asia, it is encouraged by governments, she said. However, AI innovation in Africa is driven by individual developers from grassroots communities in a bottom-up ecosystem. She noted that AI developers in Africa need tools, software, hardware, and IP and called for collaboration to advance AI ecosystems around the world.

Current capabilities of AI technology

16.   The last decade saw incredible progress in machine learning, according to Ms. Tania Bedrax-Weiss, Director of Research Engineering, Google Research, United States of America. She also noted that there is no agreed-upon definition of machine learning. General-purpose machine learning models have become more efficient in audio, text, and image recognition and

can now use efficient sparse models, which only activate paths necessary for predictions, much like neurons in the human brain. Google is working on a model that will generalize across millions of tasks instead of having a range of separate models for different tasks.

17.   There is no question that AI has made amazing progress. However, it remains a giant black box, even for its developers. Noting that there appears to be a lively debate in the IP world about how autonomous AI is operating, Prof. Rüdiger Urbanke from the *Ecole Polytechnique Fédérale de Lausanne* (*EPFL*), Switzerland, said that concerns about AI taking over the world are unfounded. He added that many scientists consider AI to be unintelligent. In some areas, AI is even underachieving. It is much less adaptable than humans and lacks a real understanding of the world, leading to predictions made on wrong assumptions. AI is a remarkable tool, accelerating science and development, and is an excellent tool in combination with humans, but AI is far from being creative or inventive in the way humans are and understand it.

AI patent trends

18.   AI technologies are a leading digital general purpose technology (dGPT) that has permeated many industries. The spectacular growth in dGPT patents in the past five years can only attest to their growing attractiveness, said Mr. Julio Raffo, Head of the Innovation Economy Section, Department for Economics and Data Analytics at WIPO. AI-related patent applications grew by 718 percent in this period.[3] However, academia and the public sector have a disproportionally high number of AI-related patents compared to companies. He expressed concern over the low proportion of individual filers, indicating a lesser role of SMEs in this sector.

19.   The China National Intellectual Property Administration (CNIPA) is building an extensive, global database of AI-related patent applications, said Mr. Li Fengxin, Deputy Director of the Strategic Planning Department. CNIPA categorizes AI patents into three categories: AI hardware, AI algorithms, and AI application technologies.[4] The database currently holds 3.5 million patents from over 90 countries or regions, he said. Algorithms, machine learning, and swarm intelligence represent the highest number of patents granted. He noted that over 90% of AI patent applications are filed in the IP5.[5] He also mentioned China's New Generation Artificial Intelligence Development Plan.[6] Like most speakers, he stressed the increasing role of AI in advancing economic and social development.

PANEL 2: STORIES FROM INNOVATORS – A REAL-LIFE BUSINESS VIEW ON AI INNOVATION

20.   Panel 2 was moderated by Mr. Yann Dietrich, Group Head of Intellectual Property at Atos, France, who gave the floor to innovators and entrepreneurs to explain how they use AI in their innovations and protect them in the context of the current IP system.

21.   Ms. Susan Ndung'u, Innovation Lead at Hello Tractor in Kenya, explained that there is a chronic gap in the supply of tractors in Africa, leading to a yield gap despite Africa's vast arable land. Hello Tractor is an agricultural technology company serving 13 African countries, seeking to increase the number of assets and raise farmers' awareness of the benefits of mechanization. An AI-based predictive model enhances tractor utilization, using satellite

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[3] See the World Intellectual Property Report 2022 https://www.wipo.int/wipr/en/2022/
[4] Based on similar work done by WIPO in the WIPO Technology Trends 2019 – Artificial Intelligence https://www.wipo.int/tech_trends/en/artificial_intelligence/
[5] The five patent offices in the IP5 are the US Patent and Trademark Office (USPTO), the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), and the CNIPA.
[6] http://www.gov.cn/zhengce/content/2017-07/20/content_5211996.htm

imagery and machine learning techniques. IP gives the company freedom to promote and share knowledge, but a weak IP framework, lack of awareness, and enforcement remain issues.

22. Mr. Keerthi Kodithuwakku co-founder and CEO of Jendo Innovations, Sri Lanka, explained that Jendo is using AI in two different health applications. The first is a non-invasive technology for the early detection of cardiovascular disease by monitoring the vascular system. The system detects early endothelial dysfunction and they hope to save millions of lives. The second application is a diabetic retinopathy screening system, which detects early signs of specific diabetes-induced eyesight deterioration, with the potential to save the vision of millions. The company proceeded with the early protection of its innovation through the PCT. IP is key to getting traction in the business world, said Mr. Kodithuwakku.

23. Telecommunication systems have come a long way, from voice-based to data-based systems, said Ms. Caroline Jacobson, Head of System Management, Ericsson Global AI Accelerator, Sweden. She agreed that AI contains nothing magic and said Ericsson uses AI when it outperforms other technologies. She gave several examples of AI applications, such as the Internet of Senses, limitless connectivity with everyone and everything in the world at any time, and a national safety system where AI is used to secure communication between emergency staff during a national emergency. Ms. Jacobson stressed the importance of patents for the telecommunications industry, particularly for sharing standards and licensing.

24. Meticuly's co-founder, Dr. Chedtha Puncreobutr, Thailand, provided information on how Meticuly provides personalized bone replacement parts and improves on standard-sized commercial implants by combining AI and titanium 3D printing. He explained that a personalized prosthesis could be 3D printed and ready for dispatch in seven days. Meticuly uses AI-assisted designs tailored using CT scans of patients before being 3D printed layer by layer. The resulting prosthetics are a perfect fit for patients, reducing surgery time. Meticuly has a varied IP portfolio with patents, trade secrets, industrial designs, and trademarks. IP allows the technology to be commercialized and protected, but also ensures that the invention is not infringing existing IP, according to Dr. Puncreobutr.

25. The growing issue of water pollution and the risk of water scarcity for a steadily rising world population motivated Dr. Afef Bohli to co-found Digi Smart Solutions, Tunisia. The company produces smart tools and services for water quality management based on the Internet of Things (IoT) and AI. The system collects information from an IoT box equipped with sensors feeding an AI algorithm linked to a mobile or web-based dashboard that monitors water quality and helps real-time decision-making. The company's technology is patent protected, she said, adding that patent disclosure provides a very accurate description of technologies that are the subject of technology transfer and other types of agreements such as licensing.

26. For the biopharmaceutical industry, AI is a source of new technological opportunities and challenges, according to Mr. Corey Salsberg, Global Head of IP Affairs at Novartis, United States of America. AI is providing a major revolution in the scientific understanding of diseases and genomics, matching the need to process and analyze massive amounts of new information. Maximizing the use of data in R&D can address its growing cost in the face of strained healthcare budgets, according to Mr. Salsberg. He underlined that the way AI is revolutionizing the search for drug candidates with generative chemistry has the potential to save billions of dollars in R&D from compound failure and to help with clinical trials. A fully AI-designed therapeutic protein might be a reality by 2030, he said. Mr. Salsberg insisted on the importance of IP policies, which allow downstream inventions to reach the market.

27. Before closing the panel, the moderator asked the speakers about the specific challenges of AI for the IP system and what changes would be most supportive of innovators.

28.   Mr. Salsberg voiced concern about the inventorship of downstream inventions that are produced either by AI autonomously or with the assistance of AI. Ms. Jacobson suggested treating AI-generated inventions like computer-implemented inventions. Dr. Puncreobutr noted that many people working with AI have no knowledge of the patent process and are uncertain about which data can be used to train AI. Dr. Bohli asked which IP rights are best to protect algorithms.

PANEL 3: AI-GYRO GEARLOOSE OR LITTLE HELPER? WHAT'S AN AI INVENTION?

29.   While there is much discussion around so-called "AI inventions", it is important to define this term carefully. Panel 3, moderated by Prof. Shlomit Yanisky-Ravid, Founder and Academic Director, Shalom Comparative Research Institute, Faculty of Law, Ono Academic College, Israel, took a closer look at novel AI models, AI-based inventions (AI as part of an invention) and AI-assisted inventions (inventions made using AI as a tool for human innovation) and the IP questions related to each of these.

30.   Prof. Michelle Azuaje Pirela, Director of the AI and Law Research Group at the *Universidad Autónoma de Chile*, focused on AI inventions consisting of novel algorithms. She set out that such algorithms, one of the most valuable and important components of AI systems, are often abstract, mathematical models and not patentable as such. She noted that only if an AI system solves an actual technical problem, the invention becomes patentable as a whole.

31.   Conflicting definitions of AI and AI inventions result from humans creating definitions to make AI understandable, said Prof. Azuaje Pirela. AI capabilities, she said, need to be understood as facsimiles of human capabilities to optimize certain tasks.

32.   Dr. Phoebe Li, Reader in Law and Technology, School of Law, Politics, and Sociology, University of Sussex, United Kingdom, focused her presentation on AI-based inventions. She presented some preliminary findings of a study from the UK Research and Innovation (UKRI) about the trustworthiness of autonomous systems. She explained that the project focuses on three types of AI-based inventions: autonomous vehicles, AI-based inventions in healthcare, and AI use in care and social robots. She said that AI has the potential to exacerbate existing issues of bias, discrimination, inequality, human health, and safety. Patent disclosure requirements and the increasing request for detailed information in AI-related patent applications, such as training data, training processes, and adaptation methods, have led to many AI systems being protected by trade secrets, she said, calling for international harmonization and collaboration between IPOs.

33.   Prof. Nakayama Ichiro, Graduate School of Law at Hokkaido University, Japan, considered AI-assisted inventions. He started by pointing out that Japanese practices are less conservative for software-related inventions and AI-related inventions than other jurisdictions. In AI-assisted inventions, AI is used as a tool in the inventive process and, as such, AI is not an element of the claims. Applicants do not have to disclose that they used AI at all. According to the 2019 JPO Examination Guidelines, the person having ordinary skill in the art (PHOSITA) should be able to reproduce the invention using ordinary technical means. AI also makes it easier for a PHOSITA to find a solution to a given technical problem, thus potentially raising the threshold for what can be considered an inventive step. He noted that AI is increasingly adopted by businesses and it may be reasonable to expect a PHOSITA to use AI regardless of whether or not the inventor used AI in the conception of the invention. So overall, AI may be shifting both the concepts of enablement and inventive step/obviousness in patent law.

34.   All speakers emphasized the need for more transparency and explainability of AI systems to address issues of patentability, fairness, and accountability. They also called for global harmonization and more clarity in patent application requirements for all types of AI inventions.

35.   Before closing the panel, Prof. Yanisky-Ravid asked all speakers if the patent prosecution process should be amended. Prof. Nakayama remarked that the notion of the PHOSITA is a matter of interpretation for IPOs and judicial courts and is often flexible enough under current patent law. Dr. Li noted that the patent system needs to avoid discriminating against some types of technology and suggested harmonizing data governance initiatives.

36.   Prompted by another question from the moderator on harmonization, Prof. Azuaje Pirela underlined that while global harmonization might be a good idea, the lack of certainty and clear criteria could reduce interest, particularly in emerging nations. She called for clear and harmonious criteria within which to operate. She suggested looking at countries that have changed their trade secret legislation to make it easier for AI models to be protected, adding that the patent system and patentability might not necessarily be the best way to go.

PANEL 4: AI INVENTORSHIP – PANDORA'S BOX?

37.   Panel 4, moderated by Ms. Ngozi Aderibigbe, Partner at Jackson, Etti & Edu, Nigeria, explored one of the currently most discussed types of AI invention, namely AI autonomously generated inventions.

38.   The panel discussed the so-called "AI inventor project". Mr. Stephen Thaler, the inventor of the Device for Autonomous Bootstrapping of Unified Sentience (dubbed DABUS), filed two patent applications (the DABUS applications) in a number of countries around the world. Mr. Thaler claims that the inventions disclosed in the applications were autonomously invented by the DABUS AI system. The DABUS applications have been rejected in many jurisdictions, as applicable patent laws have held that inventors need to be humans. Panelists argued both for human inventors and AI inventors, and for alternative solutions such as *sui generis* IP rights.

39.   Beyond the DABUS case *per se*, the speakers also looked into the social purpose of the patent system and the economic implications of AI inventorship.

40.   The issue of AI inventorship has implications for global IP policy. Ms. Aderibigbe noted that most jurisdictions have affirmed the orthodox position that the named inventor should be human. However, in the DABUS application, AI is not sought to be the owner of the patents. Not allowing an AI to be named as an inventor might lead to the undesirable effect of incorrect information being listed on a patent application, which in turn, in some jurisdictions, may be the basis for a claim for patent revocation.

41.   Dr. Giuseppina D'Agostino, Associate Professor of Law at IP Osgoode, Osgoode Hall Law School, York University, Canada, detailed the underlying social purpose principles of the patent system. Citing the Supreme Court of Canada, she said the IP system provides a bargain between the inventor and the public. In return for disclosure of the invention to the public, the inventor has limited-time exclusive rights to exploit it. In the case of AI, she asked whether allowing a machine to be an inventor promotes or detracts from the patent bargain. She cited Prof. David Weber, saying that ultimately the patent system aims to improve a nation's economic performance and contribute to social welfare. In the context of AI, Dr. D'Agostino explained that some scholars consider that the black-box nature of AI makes it difficult to disclose accurately the invention so that an AI invention may never become part of the public domain. Additionally, IP protection is meant to be an economic incentive for inventors; however, AI does not need the incentive to invent. However, it can also be argued that IP protection can incentivize human inventors to develop better, more creative AI inventions machines whose output would be good for society.

42.   Prof. Ryan Abbott, Professor of Law and Health Sciences at the University of Surrey, United Kingdom, who is a member of the AI inventor project, made the case for allowing AI to be named as an inventor on a patent application. He started his presentation by stating that AI-

generated works, using tools such as DALL-E 2 (a text-to-image AI art generator), are now covered by copyright, commercially licensed, and sold. He continued to state that AI is being widely adopted and stepping into the shoes of human researchers and inventors. AI is automating the sort of tasks that previously made a person an inventor. He further drew a parallel to artificial persons in the form of corporations that already employ inventors and own most patents. Patents therefore already incentivize the inventors' employer to invest in R&D. On this basis, he questions why AI inventors should be different.

43.   Prof. Abbott explained that the DABUS applications were filed as a discussion starter to advance the view that this kind of application is critical for promoting the underlying goals of the patent system and for highlighting that patent law needs to address AI-generated inventions. So far, all countries where the DABUS applications have been filed have declined to grant the patent except for South Africa, which has no substantive pre-grant patent examination procedure. The Federal Court of Australia held that AI could be an inventor, but this decision was overturned on appeal.[7] In Germany, the Federal Patents Court held that the human with the closest nexus to the AI responsible for the invention could be named the inventor. An appeal to the German Federal Supreme Court is pending.[8]

44.   Prof. Dan Burk, Professor of Law, University of California, Irvine School of Law, United States of America, took a diametrically opposing view to Prof. Abbott. In his view, the term "artificial intelligence" is an unfortunate mislabeling because there is nothing intelligent about AI. He preferred defining AI as statistical optimization software, able to find patterns in very large data sets. He appealed against the tendency to anthropomorphize machines and stated that no credible policy argument could justify assigning rights to a machine, because machines are indifferent to IP incentives. Prof. Burk also noted that recognizing that an AI system works autonomously would preclude all the human interaction that led to the building or operating of that system. He used an analogy of a dishwasher, saying that a dishwasher can autonomously clean dishes, which is partially true but ignores the person loading and unloading the dishwasher, as well as those involved in the manufacture, installation, and maintenance of the machine. Under US patent law, only the person who understands the outputs of an AI system could be considered an inventor. He cited some countries, such as the United Kingdom[9] and New Zealand,[10] which have introduced a statutory amendment to their copyright law for computer-generated works. The copyright in such works is owned by the person who enabled the generation or creation of the work. The same legal concept could be applied to patents and AI-generated inventions.

45.   Based on her analysis of existing patent laws, Dr. Alexandra George, Associate Professor at the University of New South Wales (UNSW), Australia, introduced possible alternative solutions to AI inventorship to best serve the interest of society at large. The first could be to remove the requirement to name an inventor at all. The second could be to name a human inventor but require an explanation of any AI involvement. Another solution would be to devise a *sui generis* approach, applying the same life-cycle principles as patents. Dr. George added that policymakers would have to decide on procedure and substantive requirements, such as owner, claims, filing date, prior art, novelty, subject matter, and exclusions. A *sui generis* system would have to consider a globalized or model law approach or become a treaty under the wider international IP framework with an international dispute resolution system.

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[7] Commissioner of Patents v Thaler [2022] FCAFC 62
https://www.judgments.fedcourt.gov.au/judgments/Judgments/fca/full/2022/2022fcafc0062
Note: all cases are listed on the Artificial Inventor Project https://artificialinventor.com/patent-applications/
[8] Bundespatentgericht, Beschluss vom 10.11.2021, Az. 11 W (pat) 5/21 http://juris.bundespatentgericht.de/cgi-bin/rechtsprechung/document.py?Gericht=bpatg&Art=en&sid=d842ef62d4a4a3090810f84d3ada7a18&nr=42859&pos=0&anz=1&Blank=1.pdf
[9] Section 9(3) Copyright, Designs and Patents Act 1988
[10] Section 5(2)(a) Copyright Act 1994

46.   Talking from an economic perspective, Prof. Gaétan de Rassenfosse of *EPFL*, Switzerland, said although there might be a strong moral case for not allowing AI-generated inventions to be patented, economists view the patent system as a policy tool to incentivize investment in R&D activities. If an invention machine creates outputs at zero cost but cannot commercialize the invention itself, those inventions would be in the public domain. He drew a comparison to inventions arising from government-funded research in the United States of America (before the enactment of the Bayh Dole Act). Due to the public funding, such inventions were produced at zero cost for private firms, and depending on the public interest, were generally required to be assigned to the government. However, requiring AI-generated inventions to remain in the public domain may deter investment into AI R&D required to produce an invention machine and, in turn, may prevent the public from benefitting from AI-generated inventions. He also underlined the weak points of relying on trade secrets instead, including the risk of reverse engineering and the lack of disclosure not benefitting the public in the longer term. Deprived of patent protection, inventions by machines would become more difficult to transfer, license, or sell to third parties.

47.   The decision of Saudi Arabia on the patentability of the DABUS application is still pending, said Ms. Reem Almarzoqi, Legal Advisor at TAWAL - Telecommunications Towers Company, Saudi Arabia. The country has made some policy formulation on AI to facilitate the growth of emerging technologies. She described Saudi Arabia as a pioneer in the development of new technologies. Among the challenges posed by AI, she cited the issue of the infringement of copyright by AI and ethical issues relating to the irresponsible use of AI technology. She highlighted the need to address the lack of well-established infrastructure in terms of supporting AI development and deployment. AI inventions should be patentable and the definition of patents should be changed to take address the fact that AI is a tool for creating inventions. She underlined the instrumental role WIPO plays in providing legal information on AI and IP and technical and legal support to Member States.

48.   The moderator asked panelists why a machine would be disqualified from inventorship when it replicates the mental process of a human. Prof. Burk argued that a machine does not perform a mental act of conception and does not replicate what humans do, thus should not be awarded a patent. Prof. Abbott maintained that it is irrelevant to patent law to decide if a machine is thinking or engaging in a mental act. He mentioned the "village of human beings" involved in DABUS and pointed out that DABUS automates the tasks that make someone an inventor.

49.   On the same question, Dr. D'Agostino suggested considering the whole innovation ecosystem and that village of humans that would be involved in the commercialization of the invention. She said that AI-generated inventions should not be locked up but benefit the public. Transparency and balance of various interests are important, she said, encouraging policymakers to shape an appropriate IP ecosystem and adding that if AI acts like an inventor, the patent system should accommodate the invention as long as mechanisms are in place to serve the public good.

50.   Answering a question about inventorship and incentives, Dr. George said the focus should shift from incentivizing the actual inventor to incentivizing those who are enabling the invention, for example, employers and companies responsible for the relevant R&D investments. The focus should shift from the inventor to the owner of a related patent right.

51.   The moderator further asked about the economic and social basis for AI inventorship. Prof. de Rassenfosse said the question should be if patents should be granted on AI-generated inventions, regardless of who is designated the inventor. He said what policymakers should ask is how AI will change the incentive to invent, and how the patent system should respond. He warned against creating a *sui generis* system because, in the future, it might be difficult to

determine whether an invention was created by a machine or by a human, and having two types of rights might result in gaming the system.

PANEL 5: THROUGH THE LOOKING GLASS – IP PROFESSIONALS AND ATTORNEY'S VIEWS

52.   Panel 5 was moderated by Dr. Rachel Free, Partner at CMS, United Kingdom. The panel addressed the relationship between AI inventions and IP protection from the lens of IP professionals and how this translates into the IP questions frequently asked by their clients.

53.   AI is a high-level and umbrella term encompassing many different technologies, according to Mr. Ryan Phelan, Partner at Marshall Gerstein, United States of America. He said that when most people talk about AI, they are referring to machine learning that requires training data to produce a specific output. One of the difficulties with AI inventions that he frequently encounters is how to draft claims for new types of models.

54.   Mr. Hector Chagoya, Founder of Mextrategy, Mexico, focused his presentation on the PHOSITA. Different countries use different definitions for PHOSITA, he said, and some do not even have a legal definition. Usually, this notional person has access to the common general knowledge at the priority date, can use ordinary means to perform routine R&D tasks, can interpret the prior art, and make deductions based on it. One of the questions he posed is whether AI-based inventions require a "machine skilled in the art". The ability to protect innovations related to AI has a huge impact on technological advancements. AI-related IP questions also include issues of sufficiency of disclosure relating to and ownership of the AI training data. This is particularly the case when data comes from different sources and is collected by machines themselves, or owned by several persons, and when the AI uses the data to generate derivative or collaborative works. The training process and the nature of the algorithm also have to be identified. One of the most important parts of an enabling description in a patent is the output of the AI system. Other questions might concern the hardware, such as if all the AI components are available to natural persons to reproduce the invention.

55.   In his experience, according to Mr. Lee Daeho, Managing Partner at PI IP Law, Republic of Korea, clients often do not feel the need to have patents when copyright protects software. Some others choose to forego protection on AI innovations in the case of open innovation or have doubts about whether they can enforce a software patent. Many leading companies, he said, open their technology to the public through published technical papers, for example. He added that some companies also combine open source and patent protection. Patents in the AI field can protect computer programs, methods, and devices, he said, before detailing the best process to draft AI invention patent claims, in particular the description of the pre-processing and post-processing steps, as well as training methods and data structure. He voiced support for patent protection for AI innovations.

56.   While there is clearly a significant amount of uncertainty around AI and patenting, businesses need to continue and protect their interests, said Mr. Nathan-Ross Adams, Data and Technology Lawyer at Michlasons, South Africa. In his experience, the main issue related to AI and IP concerns data and data ownership. An increasing number of businesses rely on contracts specifically designed to manage AI. Across the pre-development, development, and post-development process, contracts are effective in managing different IP rights, he said. He added that IP rights ownership might not be as important as in the past because the rights to use the models or trained parameters are equally valuable as ownership of the models themselves. Contracts, he added, can help businesses manage the AI lifecycle, whether it is the AI technology or the data that informs the AI. Mr. Adams suggested that IP law, and how it relates to AI, should be considered with reference to various aspects of data law, data protection, and privacy.

57.   The choice between protecting AI technologies with trade secrets or patents is overwhelming for clients, according to Dr. Free, Partner at CMS, United Kingdom. Patents describe in detail the technology, and when patent applications are published, the full details of that technology are available to the public, whether or not the patent is granted. In contrast, trade secrets keep the information confidential, she explained. The cost of patent protection may deter some businesses, while no registration is necessary for trade secrets. One of the reasons why the balance is often skewed toward trade secrets for AI technologies is the difficulty in detecting infringement. Another reason is the challenge of obtaining patent protection for those technologies and the possibility of designing around patents. However, protecting AI technologies with trade secrets might be risky if businesses have smaller patent portfolios than competitors have and are therefore disadvantaged when it comes to the need for cross licensing. Once a trade secret is breached, the damage is irreversible. She called for international harmonization about the types of AI technologies eligible for patent protection and listed new rising issues, such as the ethics of AI technologies and the wish to have AI systems to document their learning and actions in deceit-proof ways.

58.   In her role as moderator, Dr. Free asked what questions the panelists hear the most from their clients. Mr. Phelan said his clients had difficulty structuring their patent claims and knowing what information to provide. Clients struggle with the choice between trade secrets and patents, particularly when at least part of the AI algorithm will be deployed, such as in mobile devices. According to Mr. Chagoya, trade secrets are based on possession, not ownership, so the inventor is irrelevant. Small companies, he said, have neither the ability nor the resources to manage patents, so they might start with a trade secret as an interim measure before moving on to a patenting process. He said that his clients also had questions about the patentability of AI systems.

59.   On the same question, Mr. Lee said his clients are unsure about the extent of disclosure of their AI in their application. They also have concerns about data ownership as they might train their model using data owned by third parties and are eager to avoid copyright issues. Mr. Adams' clients are concerned with the patentability of AI-related inventions and whether they can be commercialized. He wondered if the EU AI Act could be the basis for global best practice.

PRESENTATION: FOSTERING AN AI ECOSYSTEM SUPPORTING LOCAL INNOVATION

60.   Mr. Arthur Gwagwa, Doctoral Researcher at Utrecht University, Netherlands, addressed the deployment and adoption of AI technologies in Africa in a short presentation to illustrate the need to consider local factors when building an AI ecosystem.

61.   According to Mr. Gwagwa and his fellow researchers, AI deployment has been increasing in Africa over the past five years, in particular in South Africa, Kenya, Nigeria, Mauritius, and Tunisia.[11] Mr. Gwagwa said this increase has mostly been driven by global tech companies from the United States of America and digital ecosystems created by companies such as Facebook and Twitter. Web 3.0 and associated innovations have not caught up in Africa, leading to a slow policy response, he explained. AI is often associated with its core components of computer science and algorithms in universities.

62.   While there is a technology lock-in from Silicon Valley and Shenzhen, he suggested that Africa should focus on the social dimensions of AI. He warned against new technologies magnifying inequities in Africa, particularly for women. He also said that the colonial fragmentation of the continent has led to dozens of languages being disregarded, but African

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[11] Gwagwa, A. et al. (2020) "Artificial Intelligence (AI) Deployments in Africa: Benefits, Challenges and Policy Dimensions", The African Journal of Information and Communication (AJIC). no. 26. doi:10.23962/10539/30361

countries lack the resources and the technological capabilities to include all those languages, leading to underrepresentation in cyberspace.

63.   AI benefits African countries in areas such as agriculture, flood and drought prediction, and land use optimization but can accentuate the impact of globalization and subject the continent to decisions made in Silicon Valley or Shenzhen. Countries of the Global North own the algorithms and the source code, so the only way Africa is going to have a competitive advantage is through its data. Mr. Gwagwa said several African countries are working on data regulation, AI strategies, and policies. However, these efforts are hindered by the lack of full understanding of different types of data (for example, user-generated, owned by institutions, or owned by global corporations).

PRESENTATION: FROM DIAGNOSIS TO ACTION

64.   Prof. Peter Picht of the University of Zurich, Switzerland, focused on the challenges for the effective protection of AI-related inventions. [12] He highlighted that it is important to remember the difference between the protection of AI systems and the protection of their outputs. The ability to protect software and computer-implemented inventions is crucial for the protection of AI systems, but the question of whether a human inventor is required for IP protection is an issue on the output side, he said. There is a strong argument for more flexibility in the future to avoid reliance on trade secrets and gain more transparency on innovative AI activity, allowing AI inventorship. It is much more important to know who owns the IP rights resulting from an AI-generated innovation, regardless of who is declared the inventor on the patent application

65.   Prof. Picht explained that the scholarly community appears to be resistant to introducing *sui generis* rights but that a greater number of high qualitative innovative AI outputs in the future may require protection that is downgraded vis-à-vis the current level of patent protection. He also underlined the question of collaborative AI-related innovations with several contributors raising questions about patent entitlement. He highlighted the fragmentation of data access rules and the lack of harmonization of copyright law on text and data mining exceptions. He called for the patent community to reach out to their neighboring IP fields to find the right balance between input protection and input accessibility. He mentioned that the Center for Intellectual Property and Competition Law at the University of Zurich and the Swiss Federal Institute of Intellectual Property (IPI) are running a policy project on AI and IP, seeking to formulate policy recommendations.

SHARING SESSION

66.   IP plays a central role in fostering innovation, but it is often unclear how to approach the many questions raised by AI innovations. Many Member States and IPOs are seeking ways to foster innovation in the AI field, close the technology gap, and encourage economic growth.

67.   This part of the Conversation was devoted to sharing Member States' experiences. IPOs and Member States explained their latest initiatives for AI-related technologies and how they foster innovation, the issues they face in this rapidly evolving technology field, and how they are seeking to help innovators.

68.   Several common themes emerged during the sharing session. Among those was the lack of a universally accepted definition of AI. Some, like KIPO, classify AI in different categories, while the USPTO found that AI technologies are best classified as subsets of computer software. One speaker suggested establishing a set of criteria to assess the technological

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[12] Picht, P. G. et al. (2022). "Artificial Intelligence and Intellectual Property Law : From Diagnosis to Action", Max Planck Institute for Innovation & Competition Research Paper No. 22-08. https://ssrn.com/abstract=4122985

contribution to inventions by AI systems, while another one supported an interdisciplinary approach.

69.   Another issue was access to data for machine learning and how to provide a copyright exception without prejudicing rights holders. The UK recently introduced a copyright database exception to allow text-to-data mining. Israel provides an exception to copyright under the fair use system, allowing machines to use copyrighted materials, and Singapore introduced an exception to allow the use of copyrighted works for purposes such as text and data mining

70.   Speakers also underlined the issue of insufficiency of disclosure of AI-related inventions and the need to have data used in AI systems explainable and traceable.

71.   Some said startups might be hindered by the fact that they cannot protect their AI-related innovations and secure investment. They might be tempted by trade secrets, which some said, are not a sustainable solution. Premature communication about their inventions on social networks also prevents their patentability. Generally, if no protection with IP rights is possible, it might act as a disincentive for the use of AI in R&D and further developments of AI systems.

72.   Some speakers from Africa stressed the challenges faced by innovators to get protection for AI-developed tools and products on the continent. They noted the shortage of skills and the weak institutional and regulatory framework relating to 4IR. They called for international coordination, support, technology transfer, and capacity building.

73.   The sharing session was also an opportunity for participants to describe ongoing collaborations. For example, the Brazilian National Institute of Industrial Property (*INPI* Brazil) is leading a project for the exchange of experiences in AI-related patent examination among BRICS members. The *Institut national de la propriété intellectuelle* (*INPI* France) is engaged in high-level bilateral discussions with other offices and created a dedicated task force to monitor case laws in major IPOs around the world.

74.   *INPI* France is seeking to explain, define and categorize the AI technologies spectrum, explained Mr. Matthieu Azzopardi, *INPI* Patent examiner. *INPI* has created a dedicated task force gathering engineers, lawyers, and IT specialists to monitor case law in major IPOs. *INPI* is also engaged in high-level bilateral discussions with other Offices. Considering that AI impacts all technology fields, *INPI* chose to have horizontal, decentralized expertise shared amongst all examiners. AI is also used as a tool in the office to enhance productivity and examination quality. Internal guidelines state that if an AI system is based on computational models, it is considered a computer-implemented mathematical method by definition, which, when claimed as such, does not constitute an invention. However, a contribution can be made to the technical character of an invention by providing a technical solution to a technical problem by non-generic technical means.

75.   The exact role of AI in the act of invention is crucial, according to Mr. Chee Muguen, KIPO's Deputy Director in the Patent Legal Administration Division. Therefore, to better grasp the question, KIPO decided to classify AI into three categories. The first category is AI core inventions, such as training methods, which represent about 42 percent of all AI inventions. The second is AI-applied inventions, where AI is used as a problem-solving or optimization tool. The third is AI inventions, autonomously generated by the system, without any human intervention at any stage of the invention, such as DABUS, the only known case, he said. In November 2019, KIPO established the Convergence Technology Examination Bureau for AI-related examinations, and in April 2020, the office published the AI-related examination cases. This was followed in August 2021 by an AI expert consultation body and in March 2022,

the office published an AI and IP white paper to summarize its actions and efforts.[13] Separately, KIPO is also engaged in the AI and IP task force in IP5 and participates in international conferences. In December 2021, KIPO hosted and organized an international conference on AI and inventorship, Mr. Chee detailed.

76.   In January 2021, the JPO inaugurated a Team for Supporting AI Examinations and developed an examination framework to provide the most efficient and highest quality examination on AI-related inventions, said Mr. Kukuu Atsushi, JPO's Deputy Director of the Multilateral Policy Office, International Policy Division, Policy Planning, and Coordination Department. Experts on AI examination provide consultation services to examination divisions and serve as a knowledge center for the examination of AI-related inventions. Creatively, JPO also issued examination guidelines in manga form for AI and IoT. Using manga is expected to attract the attention of non-patent specialists on patent examination, Mr. Kukuu said. JPO used examples of AI-related technologies to provide a clearer understanding of eligibility criteria based on the description requirements and inventive steps. The JPO also spearheaded an IP5 initiative to collect materials on the examination practices of the five offices on AI-related inventions. The initiative is expected to increase the transparency of the examination practices of the IP5 offices and enhance predictability for users.

77.   AI is a priority of the UK government, said Ms. Nicki Curtis, Senior Policy Advisor, UK Intellectual Property Office (UK IPO). The UK IPO's Future Group, a horizon-scanning team, launched a call for views in 2020 asking about the relationship between AI and IP laws.[14] The consultation showed that respondents found the current IP framework can meet future challenges, but some questions merited further exploration. One of the questions was whether the law should be amended to allow the grant of patents if AI contributions meet the test for inventorship. Respondents expressed concern about the risk of disincentivizing the use and development of AI in R&D if AI-generated inventions could not be protected with IP rights. Following the consultation, the UK government said there would be no change for the moment about inventorship in the current law, as AI was viewed as merely assisting with inventions.

78.   Another concern was about UK copyright law possibly hindering the use of data mining techniques for use in AI machine learning. The UK will introduce a new copyright database exception to allow text-to-data mining for any purpose but targeted to preserve wider copyright protection, she said. In the consultation, innovators called the international community to collaborate to reach policy consistencies on AI, particularly in the pharmaceutical sector. An alternative *sui generis* system for AI-generated invention was not supported but considered feasible as an interim measure by respondents. On September 22, Ms. Curtis said UKIPO published a new set of guidelines for examining patent applications relating to AI inventions, setting out the legal basis under which the office will approach the examination of applications relating to AI and providing examples.

79.   Ms. Rafaela Di Sabato Guerrante, IP Researcher at *INPI* Brazil, presented the result of a 2018 project on AI solutions for the efficiency of IPOs. The project mapped existing AI tools in different IPOs and found many types of applications, such as classification tools, image search, examination, helpdesk services, data analysis, and machine translation. The project also revealed that 57 percent of IPOs surveyed are using or developing AI solutions for process automation, trademark image search, trademark certification, and patent prior art searches. *INPI* is leading a project for the exchange of experiences in AI-related patent examination among BRICS members. Ms. Di Sabato Guerrante also noted that Brazil's proposal on the

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[13] Artificial Intelligence (AI) and Intellectual Property White Paper, https://kipo.go.kr/ko/kpoBultnDetail.do?menuCd=SCD0200640&parntMenuCd2=SCD0200281&aprchId=BUT0000048&pgmSeq=16558&ntatcSeq=16558

[14] Artificial intelligence and intellectual property: call for views, https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views

exchange of experiences on the sufficiency of disclosure regarding AI-related inventions was approved by the WIPO Standing Committee on the Law of Patents (SCP). She also called for cooperation to overcome challenges posed by AI solutions for IPOs, in particular, the accuracy and reliability of in-house developed AI tools.

80.   Good AI requires massive datasets, said Ms. Lital Helman, Expert at the Legislation Department, Ministry of Justice, Israel, adding that using such datasets implies using material that is probably copyrighted. Uncertainty about data that can be used to train AI systems has a large economic impact. The market for machine learning, according to Ms. Helman, is expected to reach USD 15.7 trillion by 2030. She explained that Israeli law provides an exception to copyright under the fair use system, allowing machines to use copyrighted materials. The Israeli fair use law is modeled on the US system. Creating a dataset will be permitted in most cases under the fair use system, she said. Third-party terms of use of third-party websites should not impede the right of machine learning, she said. Israel, however, does not want businesses to be established around just selling datasets to others because, in that case, people who contributed to the content of the datasets should be compensated. The Ministry of Justice is expected to issue an opinion on the right to use data to create data sets in early 2023.

81.   The central question is whether AI combined with other frontier technologies changes how innovation should be encouraged, according to Mr. Michael Falk, Director, Office of the Chief Economist at IP Australia. The distribution of rewards between the act of developing AI and generating AI-enabled inventions is a challenge. Should AI system developers, its implementers, or users be rewarded, or the owner of the data on which it runs? IP Australia is currently exploring the broader implications of AI for the IP system, including the role that IP may play in promoting the development, transfer, and implementation of AI and whether it would be socially beneficial to recognize AI as patent inventors. One question the office is exploring is whether IP protection for AI technology and outputs binds inventors to their employers, potentially constraining mobility and skill transfer while encouraging investment in knowledge development. IP Australia is working with the Queensland University of Technology to map the AI skills base within Australian firms and industries and identify growth areas where AI-skilled workers are needed. He also called for a holistic and reflexive study of AI, and international collaboration and sharing.

82.   AI technologies have been examined for decades at the USPTO, said Mr. Christian Hannon, Patent Attorney in the Office of Policy and International Affairs at the USPTO. A 2018 conference on IP and AI policies led to a series of federal register notices to stakeholders, publications, and requests for comments, particularly on the implications that AI would present for patent law. A subsequent report was released in October 2020, he said.[15] Public stakeholders suggested that AI technologies are best classified as subsets of computer software, and the general sentiment was that current US laws are adequate. The USPTO continues to explore areas such as data and a potential *sui generis* right that might foster AI technologies. In June, the office started a multi-stakeholder partnership with the AI and emerging technologies communities to capture a broad spectrum of views from academics, small businesses, independent inventors, established companies, other government agencies or partners, such as WIPO, and other Member States.[16] The second partnership meeting took place on September 22, 2022, and focused on the implications of AI on biotechnology and how to improve the examination of those specific technologies.

83.   According to Mr. Furkan Incedayi, Patent Examiner, Electronics Engineer at the Turkish Patent and Trademark Office (TÜRKPATENT), AI applications contribute to the technical

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[15] Public Views on Artificial Intelligence and Intellectual Property Policy. https://www.uspto.gov/sites/default/files/documents/USPTO_AI-Report_2020-10-07.pdf
[16] AI and Emerging Technology Partnership engagement and events. https://www.uspto.gov/initiatives/artificial-intelligence/ai-and-emerging-technology-partnership-engagement-and-events

character of the invention if they serve a certain technical purpose and are used in specific technical implementations, such as heart rate monitoring using AI to identify cardiac arrhythmia. One of the issues met by the office's examiners is the insufficiency of disclosure, Mr. Incedayi explained. He further noted that if an AI model is trained for a specific technical purpose, the PHOSITA is likely to need clear information about how the model is trained. In 2020, the office, in collaboration with the Presidency of the Republic of Türkiye, prepared a report about measures to be taken for emerging technology fields, including IoT, cloud computing, big data, data mining, AI, and blockchain technology. TÜRKPATENT is currently building a guide to tackle issues posed by AI-based patent applications, including recommendations to applicants and examiners and is seeking to understand the delineation between patentable AI-based inventions and non-patentable ones.

84.   Mali's authorities have agreed that ICT should be the main driver for socio and economic development in the country, stated Mr. Abdoul Kader Ky, National Director of Digital Economy at the National Directorate of the Digital Economy. In 2016, a national policy setting out a vision of Mali as a technological hub only very partially materialized, he said, calling for a support strategy. Mali is focusing on several areas: Agriculture, with a strong focus on digital technologies and the development of smart agribusiness in the rural sector. Health is another key area. The government also uses material and logistics software for facial recognition and management of human resources. AI is also used in transportation to ensure smooth traffic flows and reduce the number of road accidents, as well as for machine learning and translation into local languages. Despite the human potential to develop AI in Mali, no patents have yet been filed from Mali in this sector, according to Mr. Ky. He said there is a need to create an AI culture in Mali, involving capacity building to provide AI training, and ensuring that startups can participate more in the development of Mali's economy and their AI innovations are protected through the appropriate legal framework.

85.   Mr. Ahmadou Sissoko, Head of the Documentation and Informatics Office at the Malian Centre for the Promotion of Industrial Property, confirmed the country is struggling to get the protection it needs for AI-developed tools and products. He called upon WIPO to provide support to develop an effective protection system in the country and added that Mali could benefit from the expertise of more experienced players.

86.   Ms. Mercy Kainobwisho, Registrar General, Uganda Registration Services Bureau (URSB), called for the establishment of an appropriate IP infrastructure capable of supporting innovation and creativity, including frontier technologies. Uganda has a big focus on the agricultural sector, she said, also supporting urbanization and governance. In the context of the country's Fourth Industrial Revolution (4IR) strategy, the goal is to transform human capital development with capacity building and training, technology, innovations in R&D institutions, and economic opportunities. She noted potential challenges such as weak institutional and regulatory framework relating to 4IR, the dominance of a large informal sector with limited technology utilization, a shortage of skills, unprotected or unregistered innovations, and the high cost of the Internet. Uganda needs diverse policy and development interventions to address existing challenges to reap the benefits of the 4IR opportunities and requires cross-sectoral coordination at the national, regional, and international levels, she said.

87.   Switzerland seeks to harbor a favorable framework for the industry to thrive so that the private sector can develop, leaving it to choose in which areas to invest and develop AI technologies in a bottom-up approach, said Mr. Christoph Spennemann, IP Attaché, International Trade Relations at the IPI. This framework includes reliable and predictable legal and fiscal conditions, high-quality research centers and industry connections, and a highly educated and well-trained workforce. According to Mr. Spennemann, all technologies should be treated in the same manner. He underlined the importance of research, education, and IP protection, which Switzerland considers the main driving force for innovation, and means to attract investment in new technologies. Data and AI systems should be explainable, traceable,

and used transparently by the Swiss Federal Authorities, he said. IPI facilitates the sharing of non-personal data in the private sector to enable increased development and use of AI and developed several standardized model agreements on topics such as data transfer, data exchange, and related IP clauses. According to Mr. Spennemann, various interfaces between IP and AI are very unclear, such as AI inventorship, for which views points are divergent, creating uncertainty. He called for continuous discussions in WIPO, as Member States need to learn, exchange views, inform and learn from each other.

88.   The EPO has a very established practice for AI-related inventions, according to Ms. Heli Pihlajamaa, Director, Patent Law, and Procedures at the EPO. The concept of technicality is not defined to leave the door open for future developments, like AI and other emerging technologies, she said. The EPO examination guidelines have a dedicated section on the patenting of AI, and the 2022 revision includes new examples of how mathematical steps in machine learning algorithms may contribute to the technical character of the invention. The next focus of the revisions will be the sufficiency of disclosure and clarity, she explained. On the DABUS patent application, Ms. Pihlajamaa said beyond the fact that an inventor needs to be a human being, a patent application also has to indicate the inventor's successor in title, which in that case was not possible. Nevertheless, the legal discussion continues, she said.

89.   Singapore passed a new copyright act in November 2021, introducing an exception to allow the use of copyrighted works for computational data and analysis, such as text and data mining, said Dr. Wong Chee-Leong, Principal Patent Examiner, Patent Search, Examination & Analytics at the Intellectual Property Office of Singapore (IPOS). The exception further allows the sharing of data to verify the results of computational data analysis as part of collaborative research or study. The exception will provide AI developers with high-quality data while including safeguards to protect rights holders. IPOS also launched an interactive tool to make AI-related invention patents more available to innovators, which also provides tips to help innovators understand how AI has been applied and the AI state of the art.

90.   The Center for AI and Data Governance of the Singapore Management University was tasked by IPOS and the Infocomm Media Development Authority to engage a group of key stakeholders on the interface of AI and IP. The results of the subsequent study from this initiative were published in September 2022, [17] and represent the first step in the dialogue among policymakers, AI practitioners, and other key stakeholders between protecting innovation outcomes and facilitating open access to support and enable further innovation.

OPEN FLOOR INTERVENTIONS

91.   AI and machine learning-based applications primarily come from technology spillovers and absorption from developed countries in Africa and a restrictive approach towards IP protection may hinder access to the technological knowledge needed, said Mr. Godana Galm Godana, Associate at Coulson Harney LLP, Bowmans, Kenya. To reduce the technological gap, local factors have to be taken into account. He underlined the importance of technology transfer and suggested that IP policies pursue open models of innovation. The lack of access to technical data deprives many innovators of the opportunity to kick-start their innovation activity, he said, calling for collaborative policy models based on a balance between the protection of right holders and the need for open sharing and collaboration.

92.   Because there is no universally accepted definition of AI, it is essential to take an interdisciplinary approach and involve experts from different areas of expertise to define AI and define its legal status, said Dr. Dino Gliha, Attorney at Law, MGG Law Office, Croatia. He added that it is not appropriate to consider AI as a computer program since it performs

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[17] Findlay, M. et al. (2022). "Conversations at the Intellectual Property and Artificial Intelligence Interface", https://caidg.smu.edu.sg/news/2022/jul/25/conversations-intellectual-property-and-artificial-intelligence-interface

independently and takes decisions based on its own experience. According to Dr. Gliha, a *sui generis* right would allow a clear definition of the status of AI, its rights, and its obligations. He said such a regime would provide recognition and the ability to grant rights to AI.

93. Dr. Robert Harrison, Partner at Sonnenberg Harrison Partnerschaft mbB, Germany, declared that although the current system is failing in the protection of IP in the field of data science, including AI, improvements are possible. Patents used to cover tangible articles, the composition of matters or methods, he said, noting that many innovations are now based around data science, computers, and the manipulation of data, and the patenting process has not kept up the pace, he said. Patent systems around the world have become conservative, he noted, looking back to past jurisprudence based on cases in which data played no role, leading to many data science-based inventions not being patentable. Denying such patents has real-world implications, Dr. Harrison said, voicing concern about the reluctance of many IPOs to acknowledge the importance of data science innovation, particularly for SMEs and startups that cannot protect their innovation and secure investment. He agreed that such reluctance could drive a trend towards keeping innovation under wraps through trade secrets. He advised WIPO Member States to review their current policies and practices in the field of AI and for IPOs to acknowledge the technical character of the manipulation of data and extraction of knowledge.

94. According to Ms. Izumi Kyoko, Managing Director of the Japan Intellectual Property Association (JIPA), substantial human involvement is essential when inventing with AI and it is premature to introduce a legislative measure to recognize AI as an inventor. Ms. Izumi added that in the discussion of whether or not the law should be amended to allow AI to be named as an inventor, the recognition of the person involved is a key point and the technical contribution to that invention by that person should be objectively assessed. The first step, she said, should be to establish a set of criteria to assess the technological contribution to inventions by people and the AI system.

95. Mr. Sébastien Ragot, Patent Attorney at E. Blum & Co. AG, Switzerland, focused his intervention on issues met by startups. AI inventorship, he said, is never an issue in practice. The most frequent issues are communication, patentability, alternative IP protection schemes like blockchain-based and time-stamping solutions, and open source. He said some 20 percent of startups disclose their innovations on their website or YouTube before protecting their IP, so their invention is no longer patentable. Mr. Ragot also advised inventors to spend time with their patent attorneys so that they can identify what can be patented in the invention. Although alternative IP protection schemes might be tempting, he said those are not particularly attractive to investors. Those schemes should not be used as substitutes for patents, which he said remain the best tool to protect technology. He also warned against startups developing their own software solutions either for internal use or solutions they want to market using open-source software. In practice, according to Mr. Ragot, open source is mostly a liability.

96. Mr. Poyan Piredeir, Intellectual Property Counselor, University of Tehran and Marlik Institute of Innovation and Technology, Islamic Republic of Iran, chose to be the voice of youth, which he said represents some 30 percent of the world's population. Including young people in any conversation on AI and strengthening their IP, inventiveness, knowledge, and problem-solving skills will enable them to point out the best solutions and pave the way for AI in their country, he said. Young people are not merely users but crucial players and should be involved in IP policy-making, Mr. Piredeir said. He also underlined challenges for young people in terms of safety and privacy, accountability, transparency, and discrimination, but he added that AI has the potential to bridge gaps among young people around the world to find solutions to pressing global issues. He called on WIPO, its Member States, and IP professionals to promote youth IP activities and to support young researchers in the IP and technology field.

CLOSING REMARKS

97. In closing, Mr. Natsume said the Sixth Session of the WIPO Conversation on IP and Frontier Technologies illustrated the growing awareness of the importance of AI and the willingness to come together to exchange ideas to ensure IP becomes a practical tool to bring economic benefits of AI to all. WIPO's vision, he said, is of a world where IP supports innovation and creativity from anywhere for the good of everyone. This vision can only be reached through open dialogue and by connecting with a broad and diverse range of stakeholders, from IPOs to IP users, large companies, SMEs, youth, innovators, creators, and IP professionals.

98. WIPO would like to support policymakers in understanding possible options so they can consider the best way forward for their IP ecosystem, said Mr. Natsume, introducing an update to the WIPO AI and IP Strategy Clearing House. The Clearing House, he explained, collates the main government instruments and policy updates relevant to AI and IP. Much has happened since the inception of the Clearing House in 2019, and the initial questions have been overtaken by new differentiated ones, he said. Therefore, WIPO will investigate adding extra categorization and functionalities, including search options.

99. The debate around AI inventorship and clear feedback from many stakeholders highlight the need to explore the question further, Mr. Natsume said. The discussion has moved on from understanding the IP position to wider considerations of the social purpose of the IP system and economics to better inform the discussions. WIPO is thus considering preparing a paper setting out the different scenarios highlighting the follow-up questions policymakers may want to consider in this field.

100. The discussions around IP and Frontier Technologies will continue for at least two sessions in 2023, according to Mr. Natsume. Member States and stakeholders have expressed interest in IP and the metaverse, as there is a wide consensus that the metaverse represents a never before seen digitalization of all aspects of our lives. The metaverse has a multitude of touchpoints to the IP system and AI and IP will continue to be a central issue in the virtual world, Mr. Natsume explained. The next WIPO Conversation will take us on a journey into the metaverse and IP.

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