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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON INTELLECTUAL PROPERTY

AUTHOR - DR. DEMA MATROUK ALOUN, ASSISTANT PROFESSOR OF COMMERCIAL LAW, FACULTY OF LAW/ ZARQA UNIVERSITY. CONTACT -DALOUN@ZU.EDU.JO

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Introduction

Generally, the term artificial intelligence ("AI") refers to systems that display some form of intelligence and are capable of performing tasks that would typically require human capability. It includes statistics, data science, and large amounts of data and shows the possibility of generating ideas different from the original ideas. The breakthrough that led to the rapid progression of AI was the idea of training a neural network using layering to learn a hierarchical representation of data. This reinforcement learning model can be introduced as a model by assembling two deep learning models and learning them simultaneously. With these developments, AI is beginning to replace human labor in many areas. Unlike humans, the AI model can work continuously without the need for vacation, sick leave, or any other social rights. The idea is to evolve the model through programmatic reinforcement of good performance and punishment of bad performance

.Overview of Artificial Intelligence and Intellectual Property

The increasing use of artificial intelligence (AI) in the creation of new and innovative products means that AI software programs are already playing a dominant role in inventing for, and thereby impacting, the entire spectrum of technology companies. Unfortunately, the laws governing the rights and obligations of creators and users of inventions date from a pre-AI era, potentially leading to scheduled and unwanted collisions, conflicts, or uncertainties, both in the absence of human intervention in the creative process, and when AI attains the difficult territory of human thinking and manipulation, as many predict. Undoubtedly, this will test our current understanding of what it is to invent and to contain the technology, and will require interpretation and stretching by our laws and institutions. In this paper, I provide a broad overview of the patent laws that so far have governed technological change and innovation, focusing on currently accepted definitions and identifying problems that may arise from AI's create complex.

When discussing patents in the context of AI, we first look to the field of inventing and the status of AI as an inventor. An invention enables an individual to cure problems that generations have sought to resolve. In general, the law remains that only individuals can take out patents. They are the ones who derive satisfaction and financial remuneration for their vision and discard it to public access, which, in effect, at least initially, has to serve as hostages to goods. AI, of course, is not a legal person or a natural person. However, AI has increasingly allowed unrestricted access to an enormous amount of relevant data that can be used by a manufacturer of goods and can work to further the goal of patent professions. Indeed, manufacturers make up part of my community.

Definitions and Concepts

In this thesis, numerous terms are defined and conceptually (and legally, when possible) explained. Terms and concepts such as an entrepreneur, an inventor, an AI tool, artificial creativity, authorship, patents, utility models, industrial design, copyrights, neighboring rights, trade secret, trademarks, ownership, person,

machine, legal relationship, final work, and a work created by an AI tool are frequently mentioned. Furthermore, the central status of the person in the creation of works and inventions, as the main source of mutual rights and duties arises. This does not change, according to a constructed UIPoL model, and the obligations are mainly owed to the state and are a consequence of the established institutional legal order. In this thesis, some concepts do have a dual role, like person and machine.

The person is the real creator, while a machine can be the creator of what a person's creation is—AI-generated output. The concept of the machine may create problems such as its absence or its presence, as the use of the proposed naming and typological solutions may not be sufficiently precise. The AI tools do not possess person-status. Consequently, they cannot be bearers of moral and ethical principles which are activated when the interests of dispute parties or the community take precedence over the arrangement of property relations established with the power of the state. Only the person can distinguish between creativity and its mechanical imitation, and the obligation to fight, for example, plagiarism and other offenses. The state and other community members must be interested in the disputes that may arise out of the arrangement of existing relations in modern social-legal systems.

AI in Intellectual Property Creation

Going back to the title, what are we doing to promote the turn to AI in creation? What are the rules that we have that interface creating intellectual property with consuming content? That is a very complex question. And actually, the rules and everything that we have in place distort creation with intellectual property, and distort creation and consumption of content. If we are to consider that the intellectual property laws distort these markets, we have to make sure that now we have devices to interfere in these markets. By provisions, by behavioral conducts, by rules, by new remedies, property remedies, tax remedies, maybe, stock law remedies, that we have to think of as we have now very complex markets that are related to copyright and related rights.

Artificial intelligence and editing of sound patterns are also already products that are implemented. Everybody can download free of charge these devices from some common sites. But the great issue of creation through artificial intelligence, of string through artificial intelligence, of industrial designs through artificial intelligence is related to the intellectual property rights that might be attributed. They depend on the creativity, novelty, and individual character of each one of these designs. But who is the creator of these intellectual products? The person that designed the software and implemented the software, or the machine that only executes it?

AI-generated Works

The creation of AI-generated material often gives rise to the question of who should own the copyrights that subsist in such a work. It matters because selling the rights to the generated output can potentially cover the cost of building and using the AI. When the AI functionality substitutes for human cognitive processes in the creation process, copyright interests may be in jeopardy. There are treatments forcing current AI-generated materials either into or outside the scope of copyright protection. These extremes have the merit of clarity, but they certainly limit policy options and lead to substantive and unwarranted regulatory uncertainty.

The Berne Convention deems the author of a work to be the "person by whom it is created". Nonetheless, there is some flexibility in interpretation. Nonetheless, it is not hard to accept that in some circumstances the creator of the AI may be identified, but the other parties are then left largely without protection. The AI will not be in a position to assign or license the resulting work as it operates in the absence of legal capacity. Also, this treatment does not fit

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well with the exclusive right that copyrights bring, especially because it stretches into many economically important, non-artistic subject matters. The creator-only conception hardly accommodates even the needs underlying copyright law regarding the protection. There is an argument that the protection of AI-generated creations will not have great social and economic costs. Assigning protections to AI output has yet another non-negligible, market-driven objective. Without protection, incentives to produce intellectual creations might be insufficient.

AI in Intellectual Property Protection

The development of AI is essential for improving IP enforcement mechanisms and optimizing IP procedures. By understanding the impact of AI on GTAs through the lenses of EA principles, the article identifies challenges and opportunities in international lawmaking and diplomacy that AI creates for achieving more efficiency in the field of international trade. Existing GTAs differentiate the use of AI, but its further application is hindered by the institutional design of the negotiating bodies, lack of expertise among the member-states, and the politicization of trade conversations. While most of the GTAs do not address the concerns of autonomous intelligent systems nor the need to develop principles and norms proper to them, only a few take steps to mitigate the potential harms and maximize the benefits of AI.

AI is capable of creating new human-like inventions. The elaboration, filing, prosecution, defense, assignment/licensing, and administrative management of various types of IP tools for stimulating the making of new inventions (patents, utility models, and industrial designs) and literary, artistic, etc. intellectual creations (copyrights and related rights, computer software, databases, traditional knowledge, etc.) could be significantly improved by embedding AI in these processes. Such AI systems may analyze vast volumes of structured, semi-structured and unstructured data, recognize copyrightable subject matters in the inventions made by AI itself, the named inventors and authors, nominally manage IP protected assets as the legal rights owners or licensees, and assign some rights or privileges to the AI. From the appreciated tools used by each of the IA's identified stakeholders, the article concentrates on notable examples of the AI applications developed in the USA, the UK, EU, China, and Russia.

Patents and AI

Artificial Intelligence (AI), including the use of neural networks, machine learning algorithms (in particular, deep learning), genetic algorithms, and expert systems, is gradually becoming its own inventor. This article will provide an overview of the existing two directions in the doctrine of patenting the results of creative work performed by AI – "capability theory" and "interest theory". We will also conduct a detailed analysis of the problems that the legislator will face when resolving the conflict between the existing requirements for patenting inventions and the traditional rule excluding legal protection of work not related to any natural person as an inventor. We will evaluate the mechanisms of law reform based on the assessment of compliance of the existing patenting requirements with the basic policies pursued by this branch of law. Finally, we will forecast the prospects of patenting inventions generated solely by AI.

The term "Artificial Intelligence" (AI) refers to the design and creation of computer systems capable of performing new or unanticipated activities that would, if performed by a human, be considered cognitive in nature. In the meantime, the accomplishments of modern AI systems have largely exceeded expectations and include substantially improved decision-making facilitation for courts and insolvency practitioners. Despite AI systems replacing various traditionally human job functions, the question has been raised in the commercial context as to whether such systems can be

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regarded as inventors for the purpose of generating new inventions protected by a patent. There are two conflicting policy justifications inherent to the patent law that can be considered with regard to recognizing AI as "inventors".

AI in Intellectual Property Enforcement

In the current state of development of AI, which is only at its theoretical level, machines do not exist as either the property creators or the IP right holders. Nor does it have any feelings or needs to which traditional IP law would apply. Indeed, many legal theories have postulated and critiqued existing IP regimes, using economic, natural right, or creativity-based theories which were implicitly founded on humans as the primary beneficiaries or entities protected by IP laws. From the Statute of Anne and throughout the evolution of copyright law, for example, authors and creators of works of Copyright Law and the rationale for its protection was because it was a way of enhancing authorship creativity for the good of society.

However, with respect to patents or even trademarks, the human attribute may not be as pronounced. Patents were statutorily allowed to be assigned or transferred to others, who could be human or corporations, and when they expired, the inventions would fall into the public domain and any member of the public could use or exploit it. Trademarks, while traditionally seen as a store of commercial value trading upon its reputation and goodwill as a badge of origin, must however be used to make them commercially viable. In relation to either the types of IP subject matter, suffice to say that AI is technologically capable of devising creations that are unique, inventive, and can be commercially valuable to the society, enterprise businesses, or fostering organization making them valuable or integral elements in the chain of technological advances or progress of the knowledge economy.

Challenges and Opportunities

An examination of the impact of AI on patents and utility models in the context of economic, social, and environmental axes allows us to delve into the numerous advances that are currently being generated around these axes. This exercise makes it evident that AI has multiple effects that often have the virtue of improving living conditions since the variables linked to these axes are values that are sought to be maximized. For this reason, one might think that AI currently constitutes a great open door towards progress, which does not only necessarily refer to economic growth but also to improvement in the quality of life of people.

However, it should be noted that the pendular movement that maximizes these axes also has a dark side that can cause a certain imbalance in the system to emerge. In the framework of labor relations, a profound restructuring of the job market has been mentioned, where it is speculated that a significant cluster of insecure and low-skilled jobs will be created. This will have a direct impact on income distribution since the remuneration of these positions would tend to decrease. Added to this is a considerable rise in the unemployment rate (which is currently being glimpsed with the stigmatization of being the great challenge of the 21st century for the economy) which, despite being offset by the creation of new positions (for example, those related to programming for the development of AI), will force the creation of redistributive mechanisms.

Ethical and Legal Considerations

Many goal-directed intents of AI are aligned with the SDGs and with socially responsible innovation. For instance, AI supports healthcare systems and promotes innovation in preventive medicine, particularly through efficient drug development. Likewise, the use of AI in agriculture leads to conservation of natural resources, trophic safety, and new opportunities for local food producers and sellers. AI also enhances environmental safety and energy efficiency, improves access to information and

civil rights, and provides autonomous transportation, thereby reducing the number of deaths and injuries from traffic accidents and preventing adverse emissions. In view of these benefits, the UN, the EU, and UNESCO rank as top priorities the tasks of designing appropriate AI regulation in different business sectors.

These resolutions recently culminated in renewed calls to consolidate AI policies, restore the social contract with the crowd, and re-engineer the economic sustainability of business ecosystems. These pronouncements point to the requirement of developing AI designed for action so that people and machines can function better together. Legal support and ethical behavior are therefore needed to provide suitable recognition, protection, and standards for consumers, workers, entrepreneurs, and society, pave the way for reliable and verifiable AI solutions, and create reliable, resilient, and trusted AI-compliant cyber-physical systems.

Ownership and Attribution

The first area where AI seems poised to impact IP is straightforward: who owns the AI-generated work? While in the near term, it appears likely that the fact that the AI system was developed and owned by a human will be enough to attribute ownership of the subsequent work to the AI system's human owner, at least for works which almost certainly would have required human authorship to exist. However, the social question posed by machine-authored works will soon grow in importance, and we can anticipate that our laws and norms will evolve together to address them. The question of who owns machine-generated works has obvious commercial relevance. There may be increasing wealth-creation activity in future decades that relies on AI, and if people or corporations no longer own the works created by the activity or no other IP substitutes are developed and made available, what consumer incentives can we expect to continue supporting that activity?

International Perspectives

As a final topic of discussion, we turn to international perspectives regarding the impact of AI advancements on intellectual property. Granted, technology has no borders. Rapidly developing technological advances can be seen in every corner of the world. However, policy, including intellectual property policy, is by nation or international treaty, each of which negotiates from the positions, biases, preferences, or experiences of its own. Whereas the US and EU have both extensive legal doctrine on copyright and AI, countries outside these two jurisdictions are less likely to add a new copyright exception to address ownership of work created by AI. For example, Japan modified its Copyright Act to clearly state that such an exception is not necessary. The exception in Taiwan's Copyright Act has clear limitations as to how qualifying AI technologies are identified and is arguably inadequate for either the ownership or infringement use case. If AI technologies become cost-effective to be employed under a time crunch, it might lead to a rush of non-qualifying AI technologies making the copyright exception irrelevant altogether.

Comparative Analysis

The dramatic increase in computer processing capability, low-cost computer memory, and readily available high-speed data networks have facilitated phenomenal advances in artificial intelligence (AI) technology. However, creating a clear competitive framework to exploit technological advantages from AI technology and still avoid infringing the intellectual property rights of other market actors is vital. It is vital because, as technological and market competition barriers are lowered, preventing blocking or any exclusive rights abuses will discourage potentially beneficial and welfare-enhancing behavior, encourage positive technological spillovers, and promote economic growth.

Ongoing Research: Throughout this paper, we have provided numerous examples of the technical challenges that AI presents to IP

rights. Despite these challenges, however, we believe that AI is in its infancy. As the amount of funding and the number of people working on AI technology increases, it can reasonably be expected that the rate of technological change will also increase. As such, this paper should be considered a progress report on a major area of research that is currently underway, rather than a comprehensive guide. Furthermore, our current efforts to integrate property rights with technical advancements deserve the close attention of any government, business, or individual with a stake in the current technological revolution. A clear understanding of the impacts of AI on IP rights will facilitate the establishment of a clear framework to exploit technological advances from AI technology and still avoid infringing the IP rights of others.

Future Trends and Implications

1. Potential new limitations and exceptions for AI

The question of whether to introduce a sui generis regime to deal with AI-generated outputs has been raised in academic literature and by WIPO. While following the same subject matter paradigm according to which works are protected, those in favor of a specifically tailored regime are worried about the risk that, in the absence of protection, data-maximization goals would inhibit access to the material that AI generates. It might be advisable to add a level of protection for AI-generated works, but only under very specific conditions, providing restrictions and control measures, as well as mandatory labeling so that it can be easier to distinguish between content that was created by humans and that created by machines. An important point of discussion is related to the copyright status of AI-generated outputs, and their potential qualification as a work, a mere product, or as assisted human works.

2. AI and patents

AI, through the speed with which it learns and understands information, is increasing the pace with which products and services are created, tested and introduced into the market. Given the level of complexity in the development of many different technologies, the possibility of having an AI system autonomously identify, extrapolate and solve complex problems has a significant impact on various stages of the innovation process. In this way, the value of AI in the patents field not only relates to its capacity to elevate the results of research to an industrial or commercial level, but also prevails in its capacity to automate the administrative process, facilitating access to information, contributing to the increase of rational systems, and contributing to the reduction of costs and the duration of the prosecution process of the applications for patent rights.

Conclusion

In summary, AI, while opening up new possibilities for the innovation and production of knowledge-based products, presents significant challenges to the current IP framework. Although creating the product, it is difficult, by definition in some cases, to identify the inventor. In our view, the priority should increasingly be accorded to copyright since that is concerning the products and services into which a considerable investment has been made to ensure they have widespread consumer desirability. The consumer, however produced, will be unable to distinguish between products made without AI, those made by standard AI and those made by an enhanced AI system. Consumers do not access a product for the purpose of engaging in the inventive process. This is the case even for perhaps the most interesting AI use that of using AI to generate new artistic works.

Whatever the likely and potentially disruptive impact of AI computer-based systems and their widespread application to specific economic and cultural development, policy makers and lawmakers should urgently be exploring ways of adapting and updating existing legal frameworks both at the international and the national level.

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