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BLOCKCHAIN TECHNOLOGY APPLYING TO
INTELLECTUAL PROPERTY OBJECTS

General problem statement. Blockchain's enormous potential and its application are gaining momentum in all industries nowadays. In particular, in 2017, a fantastic rise in cryptocurrency value based on the Bitcoin blockchain [1] drew general public attention to the blockchain concept, where blockchain protocol was firstly officially presented and published under Satoshi Nakamoto's pseudonym in November 2008 [2]. The official presentation described the concept in which transaction packets (blocks) between users (nodes) are cryptographically linked in chronological order, creating a continuous, protected from unauthorized access register (chain), which is stored and managed by all users simultaneously (distributed book) where intermediaries involvement in particular service providers is not required. After all, each user has a private key (to initiate a transaction), as well as a public key (to receive funds). Thus, blockchain technology spread is active to intellectual property field due to the fact that blockchain increases not only data transfer speed but also maintains high quality. Moreover, increasing data integrity and security intellectual property and procedures acceleration for intellectual property rights registration between relevant agencies.

Presenting main material. Do blockchain principles work in the field of intellectual property law? First of all, it should be noted that any intellectual property type (e.g. patents, utility models, trademarks, know-how, etc.) can be blockchain subject, as an object of transactions can be freely determined depending on the purpose appropriate use case. One area of application could be (public) intellectual property registers, such as German or European patents and trademarks registers. For example, assignments of intellectual property rights, licenses or patents for patents may be entered by parties into blockchain register (an appropriate software API is provided), which reduces reviewing time and cost which could make register more reliable. constant register updating [3].

In the context of any development agreement, any work results (e.g. contributions from collaborators, freelancers) - more precisely, corresponding "digital fingerprint" (hash value) can be stored by blockchain, which will allow parties (as well as any other third parties) to verify data providing accuracy. Such confirmation may be of particular importance if applicable legal regime does not

provide for a registration mechanism (which transfers absolute rights to a person or particular subject). In addition to the above, it should be noted that with blockchain technology help we can increase samples and trademarks registration process efficiency by excluding some stages and procedures.

Is there a legal regulation of blockchain technology in the field of intellectual property? Thus, in 2019, World Intellectual Property Organization held first conference on the use of blockchain technology in the intellectual property field data sets [4]. One of the main goals of WIPO "Blockchain Target Group" is "to study using blockchain technology possibility in IP rights protection, processing information about intellectual property and their use" [5]. In this context, WIPO's White Paper on the Blockchain aims to prepare a paper for further research on opportunities and challenges, identify potential uses and develop recommendations for compatibility and intellectual property ecosystem management [6].

Another step in blockchain technology use regulating of intellectual property field should be considered an initiative under the recent EU Commission "Intellectual Property Action Plan" [7], EU Intellectual Property Office (EUIPO), which is actively researching blockchain use and recent launched the World's first official blockchain-based register of trademarks and designs in April 2021. New blockchain automatically stores data related to registered intellectual property rights in various intellectual property offices EUIPO TMView and DesignView online platforms (which collect more than 62 million brands and 17 million designs) are now fully connected to the blockchain and updated online real-time [8], in particular many firms involved to intellectual property across Europe are expected to join initiative throughout the year. Other uses currently being investigated concern EU's copyright administration and anti-counterfeiting infrastructure [9].

Is it possible to protect intellectual property on blockchain technology for owners? Patenting and blockchain technology. As a result, blockchain technology itself is not patentable due to the requirements. However, algorithms and processes on which the programs are based, of course, can receive patent protection. Also, by 2018, 21 US patents and one European patent in the blockchain technology field had been issued [10]. These patents include, in particular, technologies that may subsequently change blockchain, as well as security procedures for blockchain.

Copyright and blockchain technology. From the copyright point of view, there are minor difficulties for blockchain technology compared to the existing requirements for copyright registration for software product. Thus, as a rule, blockchain applications are protected by copyright law, where protected work includes, in particular, source code, binary object code of the program and project materials [11]. Nevertheless, for blockchain technologies operators and users it means that third parties rights must be taken into account, for example, by granting sufficient rights to use or enter into appropriate licensing agreements

with such programs providers. In particular, it is due to blockchain applications high complexity that copyright issues arise for blockchain technology users [12].

Are there any restrictions on the use of blockchain technology for intellectual property rights (barriers)? First of all, areas in which blockchain technology and intellectual property rights field can be widely used are also widely discussed or proposed. However, due to the particular problems of the technology itself or intellectual property rights area (especially copyright), there are several obstacles to blockchain technologies widespread use for intellectual property rights:

1. Owner information protecting problem. Blockchain is based on a consensus protocol (PoW or PoS), where transaction must be processed, and each node must have blockchain state entire copy in sync, where considering intellectual property, including copyright, arise problem that "content file itself" cannot enter in a chain of blocks. Due the fact that working file itself is virtually impossible to mount in a chain of blocks that are executed and work-related, and they only have information that is work-related or work-related, which raises question of what data was transferred and what should be legal protection as such.

2. Problems with input of information about blockchain, input information accuracy and ability to use information in matters of registration of intellectual property rights to objects. Blockchain technologies main advantage is transparency and openness. As it is impossible to change information (data, content) in a short time, information accuracy is checked and registered, intellectual property rights existence, increasing intellectual property transactions through smart contracts, transactions, including possible control strengthening by intellectual property owners, intermediaries' exclusion (immediate direct payment for use), transaction costs reduction.

However, to use blockchain technology characteristics, firstly, information must be written "once" in a chain of blocks, and to record it, we must record information in its original form. Secondly, information about specific work and all information about transaction (as, for example, transfer of rights, licensing) is placed in the chain of blocks and change information is impossible, because chain of blocks is work history and in case, for example, we can only provide information about blockchain history management function, which contains basic requirements for design, for example, copyright for a specific intellectual property.

3. Complexity of blockchain technologies using intellectual property rights establishment regulating at the global level. Intellectual property rights are very complex in nature, including having multiple rights holders, licenses, and expiration dates, etc. Moreover, even with the creation of a global chain of blocs, it is difficult to expect the management of intellectual property rights, given the complex legal relationship of establishing property rights to specific objects under different legal regulations [13].

Conclusions. Although the idea of creating a more efficient blockchain-based system for dealing with intellectual property rights is still new, new blockchain-

based programs for intellectual property management continue to appear with extreme frequency. However, many issues remain unresolved, such as the development of blockchain technologies in the field of intellectual property and their objects at the global level, as well as legal issues such as data ownership, confidentiality, liability and jurisdiction of blockchain technology in the field of legal protection. violated the rights to use such technologies. These questions are the prospect of further research.

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