

ETHICAL, TECHNOLOGICAL AND PATENT ASPECTS OF TECHNOLOGY BLOCKCHAIN DISTRIBUTION

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ABSTRACT

The article extensively presents ethical, technological and patent aspects of the impact on the distribution and socialization of blockchain technology. It was proposed to single out the stages of technological adaptation to the needs and demands of the global community, namely: single applications, localization, substitutions, transformation and ethics. Problems in the patenting of blockchain technology were studied, the influence of corporate structures and state regulatory agencies on the use and distribution of blockchains was determined. It was also proven that the blockchain social and ethical adaptation of technology is a significant obstacle to the development of the ecosystem of the blockchain.

Keywords: Blockchain Technology, Ethical Adaptation, Ethical Application, Technological Adaptation Stages, Blockchain Patenting, Patent Protection.

INTRODUCTION

The modern world is on the verge of a decentralization revolution, which was created by the development of blockchain technology. IT industry experts (Narayanan et al., 2016) do not consider blockchain as a “destructive” technology capable of breaking the traditions of society and the global technological order, but as a basic technology that has the potential to create new foundations for existing economic and social systems. However, despite the expectations of the huge impact of blockchain in the short term, according to expert opinion (Levis, 2018), this technology will take decades to integrate into the existing ethical, technological and social infrastructure. The process of adaptation will not be sudden, but gradual and sustainable, as the waves of technological and institutional changes are gaining momentum.

METHODOLOGY

The study methodology is based on the classification of innovations in basic technology by the level of readiness for adaptation (adoption), based on two aspects that have a decisive impact on the development of basic technology and applications (Arnold, 2017). First, it is a novelty, a factor according to which technology is new for the whole world. The second factor is the complexity of the level of coordination of the system (the number and diversity of

participants who must work together in order for this technology to bring benefits). Since a single-member social network is not attractive and only makes sense when it has been joined by many members of this community, it is necessary to involve other users in this community in order to generate value for all members (Kraft, 2016). The same can be said about blockchain technology. As this technology increases in scale and becomes more active, its adoption will require significant institutional and ethical changes.

RESULT AND DISCUSSION

The adoption of basic technologies usually occurs in four stages, each of which is determined by the novelty of the applications and the complexity of the coordination efforts required ensuring their performance: (1) single applications; (2) localization; (3) substitution; (4) transformation and ethics. Applications with low novelty and complexity receive priority and are implemented quite quickly. Applications with high novelty and complexity require decades to develop, but can radically transform ethical norms and technological landscape.

Single Applications

This stage includes low-novelty and low-coordination applications that offer better, less expensive, highly specialized solutions. Email as a cheap alternative to telephone calls, fax and street mail, was a one-time use for TCP/IP protocol (although its value increased with the number of users). Bitcoins can also be attributed to this category.

Localization

The second stage includes applications that are relatively new, but for their implementation only a limited number of users are needed and therefore they are relatively easy to promote. If the blockchain goes along the path of networking technologies adopted in business, we can expect that innovations in this area will be built on one-time applications to create local private networks through which several organizations are connected through a distributed registry. Most of the primary development of private blockchains occurs in the financial services sector, often in small networks of firms, so the coordination requirements are relatively small (Consensys, 2018). It is expected the wide spread of private blockchains, which serve specific goals for various industries.

Substitution

The third stage includes applications that have a relatively low novelty, because they are based on existing one-time and localized applications, but have high needs for coordination, since they imply a broad and tendency to increase use in society. These innovations are aimed at replacing all ways of doing business. However, they face high barriers to implementation, since they require not only greater coordination, but the processes they hope to replace, can be full-scale and are deeply rooted in organizations and institutions (Makedon et al., 2019). One example of such a substitution is the cryptocurrency-the new fully formed currency systems, which grew out of a simple bitcoin payment technology. The critical difference is that the cryptocurrency requires each participant to carry out monetary transactions, to accept it,

challenging the governments and institutions that have been processing and controlling such transactions for a long time. Consumers also need to change their ethical behavior and understand how to implement new cryptocurrency functionality.

Transformation and Ethics

The fourth stage includes completely new applications that, if successful, can change the very nature of economic, social and political systems. They involve the coordination of the activities of many participants and the achievement of an institutional transaction on standards and processes. Their adoption requires significant social, legal and political changes.

Smart contracts (smart contracts) at the moment can be the most revolutionary transforming blockchain application. There is already experience of several early experiments with such smart contracts in the field of venture financing, banking and digital rights management. However, the widespread adoption of smart contracts is still far away. They cannot be effective, for example, without institutional approval. It is necessary to create institutional bases for coordination and clarity of the issue how to develop, verify, implement and apply smart contracts, apply ethical standards to them, and at the same time, the institutions responsible for these tasks will need a lot of time (Kosba et al., 2016).

Making comparisons with the development of the Internet, experts suggest that at such an early stage of development of the blockchain, we are still not able to predict which fields of human activity will be affected by this technology. Thus, it took more than 30 years from the development of TCP/IP protocol, which laid the foundation for the development of the Internet, so that we could see its real impact on the world.

Another serious obstacle to the development and implementation of blockchain can be the problem of patenting the proposed IT solutions. The blockchain technology has created a completely new field in the intellectual property space, and competition here can be very tough. It is important to note that in just eight years since the discovery of this technology, which has made the algorithms underlying the blockchain public, it still has risks to become unprecedentedly closed. In the United States, which is the leader in the development of blockchain technologies, there has been a real war for the right to use developments in this field. Applications for blockchain-related patents submitted by a number of applicants, including large banks and corporations, have provoked a strong and mixed response in the blockchain community.

The most striking example is the application of the investment bank Goldman Sachs, in which the applicant asks for a patent for *“processing financial transactions using a distributed database to store part of the accounting register, corresponding to the proper asset”*-in other words, blockchain tools are proposed to be used to manage transactions (Murphy, 2018). The following major financial structures, such as Bank of America, Morgan Stanley, etc., are listed as patent holders of hundreds of patent applications related to the blockchain.

As of the end of 2018, the US Patent Office did not grant patents on any of these applications. If patents are granted, patent holders, having received a 20-year monopoly on various aspects of the blockchain, will be able to recover millions of dollars as royalties from blockchain users or prohibit their use. Moreover, the owner of the rights can use the *“patent trolling”* model, which contradicts the ethics of technology sharing. The very fact of filing applications for patents has caused tension in the bloc consortium R3, which has a policy of open

access to blockchain development. According to some experts, the surge in patent disputes can be devastating for the development of technology (White, 2017). It may be premature to assume that patent holders act solely for protection purposes, and banks will transfer the patents they receive to a consortium that seeks to facilitate the introduction of blockchains in the financial sector.

There are no agreed assessments of blockchain technologies among government agencies of various countries. Some countries prefer non-interference policy; others introduce new rules and regulations. At the same time, the special report presented at the World Economic Forum in Switzerland on the introduction of blockchains into the world economy, the obligatory regulation of the blockchain system, as well as the danger of this technology for the security of the state were disputed. Meanwhile, some experts are of the opinion that patent protection will become an integral element of the development of blockchain technologies (Swan, 2015). Thus, the emergence of clusters of patents for technological applications of the blockchain will create a situation similar to that in the telecommunications industry, when companies pay intellectual property owners for access to standard technology.

However, it is still unclear whether patenting is the best approach to promoting blockchain technology and does not contradict the issue of such patents to US law. In 2014, a precedent was created in the USA in the form of a decision of the US Supreme Court in the case of Alice Corp. against CLS Bank International, which ruled that most or perhaps all software patents are abstract ideas that are not entitled to patent protection. Since the blockchain is a form of software, all applications for patents on the blockchain are faced with this precedent. On the contrary, an application that improves the technological functioning or processes of the computer itself, for example, improving efficiency or security, can be patented (De-Novellis, 2018). The US Court of Appeals for the Federal District tries to develop a reasonable position for computer-implemented inventions. The results of our patent analysis show that the collection of patent documents of the world related to blockchain technologies has a composition that is not quite typical for breakthrough and pass-through technology. Figure 1 clearly demonstrates a sharp increase in patent activity in this field, especially in the period of 2016-2018.

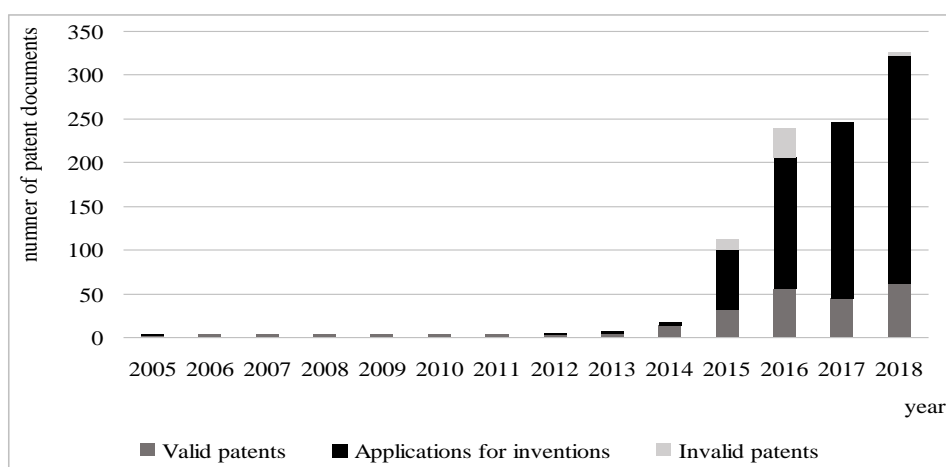


FIGURE 1
DYNAMICS OF PATENT ACTIVITY IN THE WORLD IN THE FIELD OF BLOCKCHAIN
(STATE OF BLOCKCHAIN REPORTS, 2019)

Thus, the number of applications for patents increased from 10 in 2015 to 169 in 2018, having increased by almost 17 times, and for incomplete 2017 the number of registered patent applications has already reached 262 copies. While the situation with patent protection of blockchain solutions is unclear, banks are seeking to protect their innovative solutions, and patent attorneys are concerned that the US Patent Office will not be able to apply appropriate quality control measures and will issue a large number of patents to use blockchain for a wide range of purposes, that slow down the evolution of technology in different industries. Examples of patents that limit the use of blockchain-based technical solutions are a patent issued to Goldman Sachs for the SETLcoin encryption technology, as well as a patent for a Bitcoin-based subscriber server issued by AT & T. It is believed that social and ethical adaptation of technology will become a more difficult obstacle for the development of the ecosystem of the blockchain (Eyal et al., 2016). This obstacle will be decisive for a number of organizations that greatly benefit from asymmetric information and the need to trust third parties.

RECOMMENDATIONS

Recommendations based on the results of the study are formed as a statement on the need for patent analysis and patent protection of branches of the blockchain technology in the global patent landscape. This is today a critical circumstance due to the high level of uncertainty in matters of ethics of general application and protectability of blockchain algorithms. At the same time, attention should be paid to the delayed, perhaps for a short time, readiness of industrialized countries to expand in the global intellectual property space associated with the blockchain, as soon as the general application ethics and patentability of the proposed IT solutions will be proved.

CONCLUSION

The institutional environment of the world community must adapt to new technologies, especially to the blockchain. Blockchain can be used as an infrastructure for making calculations and any partnership interactions. The execution of any agreement is usually carried out through a series of related agreements. The blockchain allows simultaneous transactions to be performed by multiple parties and levels, eliminating the need for intermediaries and transaction support. This key aspect points to the importance of patent protection and moral support for this technology. Thus, it is safe to predict significant changes that the blockchain can bring to almost all fields of business and social activity of the world community.

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