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# PROSPECTS OF DIGITAL TECHNOLOGIES APPLICATION IN CORPORATE GOVERNANCE

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**Abstract**

The article considers the impact the informatization of society and the development of digital technologies have on business; opportunities, problems and prospects of applying artificial intelligence, big data analytics and blockchain technology in corporate governance with a view to support the development of more qualitative and transparent relations between stakeholders.

**Keywords**: corporate governance, board of directors, shareholders, artificial intelligence, blockchain, decentralized autonomous organization, digital economy.

The term "corporate governance" includes not only economic interests of shareholders and legal standards for the protection of their interests, but also presupposes complex and multifaceted relations with regard to owning and managing various resources. In the context of transition to the Fourth Industrial Revolution, called [1] by many experts "Industry 4.0" or "Digital Economy", the information is one of the most significant resources of corporate relations. The stakeholders' relationship regarding the accumulation, dissemination and analysis of economic information becomes more and more important year by year.

However, according to the estimates of the research organization Conference Board and the Center for Corporate Governance Studies of Stanford University, 93% of companies do not resort to digital data sources in their decision-making process, although every day the amount of information created measures in trillions of megabytes [2]. Nevertheless, in recent years, companies

have set their focus on new technologies that allow them to accumulate and process information more efficiently.

According to 77% of CEOs in all countries subject to PwC's Boards Survey 2016 "Between strategy and tactics" [3], technological breakthroughs are the leading trend impacting contemporary business. According to PwC's 2017 Annual Corporate Directors Survey [4], the Internet of Things, artificial intelligence, robotization, drones, blockchain and several other technologies are going to become key drivers of corporate strategies within the next 2 years.

Companies draw heightened attention to the effectiveness of working with information as a resource, they develop and implement digital technologies in various business applications to maintain efficient processing of information flows. A survey conducted by the Global Institute of McKinsey (MGI) shows that 10% of the most efficiently digitized companies generate 2-3 times more revenue for shareholders and provide greater operating income growth. That is why at the present moment corporate stakeholders and management face the following choice: either to produce quick and adequate responses to the challenges brought by the informational and digital development of society, or to try to maintain the previously created system without introducing the changes required by the "new age". However, the risks of falling behind such digitized companies, as Uber, Airbnb, WeChat, or Alibaba, and the consequences of this gap become more dramatic every year. According to the analysis of the Global Institute McKinsey (MGI), within the next 20 years about 50% of all global professional operations are going to be automated taking into account the current technology level [5]. What is more, according to their forecasts, process automation is going to affect up to 1.1 billion employees with a total annual salary of $15.8 trillion. Such radical changes in the productive labor pattern undoubtedly require a change in the management paradigm.

Further digitalization of business and all economic activities through the use of big data, artificial intelligence, and the search for new ways of using blockchain can lead to major changes in corporate management itself. Anticipating these changes and being aware that information, digital technologies and their effects constitute an essential component of business development, some countries already consider IT Governance and cyber risk management tasks to be a responsibility of Board of Directors; which is further confirmed by the introduction of respective sections to national codes of corporate governance. New technology and related risk management aspects are already included into the Corporate Governance Codes of the United Kingdom (2016), South Africa (2016), the Netherlands (2016) [6], [7], [8] and they are being considered [9] by the Expert Council of the Central Bank of the Russian

Federation as a possible addition to the upcoming revision of the Corporate Governance Code of Russia.

These governance changes indicate that both informatization and digitalization are being actively implemented to change the very essence of corporate governance in order to accelerate decision-making processes, improve transparency, risk prediction and decision results. This can be confirmed with the data from the surveys of managers' opinions on the future of society and business. For example, according to a large-scale study conducted by the International Expert Council of the World Economic Forum (2015), 75.4% of surveyed CEOs believe that 30% of corporate audits will be carried out by artificial intelligence by 2025; moreover, according to 45.2% of respondents, the Board may include the first robot with artificial intelligence by 2025 [1].

**Artificial Intelligence and Big Data Analysis in Corporate Governance**

There is a limit to new factors and ideas that a person is able to assimilate and analyze over a certain period of time. It is his or her adaptive level of perception. In this regard, problems associated with the need for intellectualization of information and organizational processes, and intensification of intellectual activity at the Board level require an immediate solution.

Artificial intelligence capabilities allow us to analyze large data arrays without major spending of resources as compared to the efforts required to analyze the same amount of information by a human specialist. Implementing artificial intelligence is especially important when the control object and its external environment are a complex of intricate processes and factors that significantly influence one another, as well as within the framework of complex multicriterial tasks [10]. It is under these circumstances that the Board of Directors generally operates.

Even now artificial intelligence technologies start to penetrate corporate governance. In 2014, the Hong Kong Venture Foundation "Deep Knowledge Ventures" became the first company to integrate artificial intelligence into the Board of Directors, and entrusted AI with evaluating and ranking projects under consideration by the Investment Committee. Board Members in this company evaluate projects alongside with their artificial counterpart. If the votes coincide, the draft is approved, however, if the opinions of Board Members diverge from their artificial colleague, then an additional analysis is carried out taking into consideration new information provided by artificial intelligence, and the voting is conducted until all differences are settled [11]. Indeed, Board-level decision-making process requires larger amounts of

data, and the more complex a solution is, the greater amount of data that is hard to obtain for a human specialist is required to make a rational decision. Another advantage of using artificial intelligence to support decision-making process is the fact that an artificial colleague can work all day and night, and the only resource necessary to ensure the machine's contribution is maintaining its vital functions. Since computers, algorithms and artificial intelligence are particularly suitable for processing big data, in the near future they will contribute to a higher quality of decisions. Moreover, machines possess one of the most important features: they are impartial and free of conflict of interest, which solves the problem of attracting independent directors and ensures actual independence of making a decision.

However, granting artificial intelligence with a director status seems to be questionable, since an artificial colleague does not take into account the interests of owners and other stakeholders, it is not value-oriented and can only assess the situation from the mathematical point of view, and, eventually, according to the proponents of the Theory of Singularity, it is possible that artificial intelligence may seize power in the company and even in the whole world, if it is empowered with appropriate rights and opportunities. Nevertheless, taking into account possible risks, such an algorithm might become an effective assistant to the Board offering recommendations for consideration and paying attention to the strengths, problems and risks of certain decisions. And the accuracy and efficiency of decisions can be increased when artificial intelligence technologies are able to analyze relevant real-time information. On the basis of this information it will be possible to make the most comprehensive forecasts as well as to test hypotheses and make timely updates to business plans and strategy.

**Blockchain in Corporate Governance**

Another technology at the height of attention due to the growth of Industry 4.0 is blockchain. This technology is used in the financial domain as well as in some other areas – energy, operations with goods and raw materials, copyright and ownership attribution, video games [10], authenticity verification and confirmation of access rights, etc [12], [13].

A number of scientists and researchers consider blockchain to be a promising technology with regard to its ability to make radical changes in corporate governance through creating a new corporation type based on DAO (Decentralized Autonomous Organization) technology [14], [15]. DAO is a software that uses digital ledger technology (DTL) [16]. This technology is a core element of such brands as Blockchain and Ethereum. It should be noted

that these technologies have been developed since the 1970s, but received a fresh development impetus due to the growing interest in cryptocurrencies.

The DAO technology secures operations of a distributed data exchange network and communications of end users who act as subjects of respective virtual transactions. The DAO concept was the first to be implemented at a virtual investment foundation of the same name. The DAO Foundation managed to attract more than $150 million in order to invest cryptocurrencies in startups. DAO participants bought digital tokens and used them to vote for investment projects. It should be noted that there are no managers in such DAO-based virtual organizations, and relations between token owners are structured as a complex system regulated by DTL technology.

Hitachi [17], having become one of the first companies to start implementing DAO in its processes since 2016, announced creation of a corporate governance system based on the decentralized autonomy approach. It can be stated that pathfinding experiments aiming to implement blockchain in management have already begun. However, one should keep in mind that the DAO concept can be implemented in a company, in which business processes can be described through smart contracts and all employee tasks, remuneration and other activities should be prescribed in the program code. In addition, there is no such feature as "employee recruitment" in a decentralized organization. Instead, there are token holders, who grant their votes to future employees who will be contracted for a short period of time to perform a certain task. This means that DAO is not able to function, if there are any errors in business processes, which currently is not fully feasible for most companies.

Russia also already has certain cases of implementing blockchain technology in corporate governance. In 2017, one of the world's first online voting systems was developed for the National Settlement Depository. This voting system allows the voting process to be completely transparent and to maintain anonymity of security holders, which was previously impossible. The system is designed to solve the following tasks: creates a mechanism for shareholders voting and subsequent storage of data so that each voting participant can be sure that his or her vote is accounted for; none of the voters can determine what decision was taken by the others; all data is secured in a way that excludes further alteration [18]. However, currently some people are distrustful of this system, since those who are not experts in the blockchain technology still perceive it as a "blackbox" and are not able to understand how the votes are counted, or whether the votes were tampered with or whether there is an error in the code. Nevertheless, the described system for shareholder voting is one of the first of its kind, and it is possible that it will be developed

further and the issue of mistrust will be resolved. As for now, of all available digital technologies, only traditional electronic voting systems are being actively introduced into corporate governance.

It should be noted that all currently existing blockchain-based systems have a number of vulnerabilities, are based on a consensus, and allow to select no more than two options out of the "security-speed-scalability" triangle. And most systems are neither protected from scammers nor secured against forking, like the DAO Investment Foundation, which suffered a loss of nearly $50 million in such an attack [19]. Nevertheless, in spite of a number of issues related to the technology and its legal regulation, the first attempts to create blockchain-based systems stand for the possibility of their application and the need for further experiments, research and adaptation.

Thus, global professional community is actively discussing digital revolution and potential for using new technologies. In this respect it is important to understand that "digital revolution encourages each company to move from a business model based on products and services to a business model based on networks and platforms" [20]. In support of this statement, E. Vermeulen also notes the changes in modern business philosophy due to brought about by the influence of the "network society". He highlights a strong shift of focus in relations between Board Members, shareholders and management towards greater cooperation and long-term interests of each participant of this relationships [21]. Such relationships significantly increase corporate requirements for data accumulation and processing, change data disclosure approaches, and result in data transparency, relevance and completeness. In addition, informatization and digital technologies, such as artificial intelligence, big data and blockchain analytics, are designed to effectively assist in developing better and more transparent relations between stakeholders.

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# ASSESSMENT OF MARKET VALUE OF SOCIAL NETWORKS: PRACTICE OF APPLICATION OF THE DISCOUNTED CASH FLOWS METHOD

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**Abstract**
This article considers the main social networks of Russia. Assessment of the market value of the business of social networks by income approach with the use of the discounted cash flow ("DCF") method is made. This makes it possible to determine the vector of development and demand of paid services on the base of social networks.
**Keywords:** business valuation, startup, income approach, discounted cash flow method, NPV, social network.

В современном глобализированном обществе с учетом развития цифровой экономики и финансовых технологий трудно представить гражданина в трудоспособном возрасте, а также старше, который не выражал бы заинтересованности быть зарегистрированным в какой-либо социальной сети для различных целей: встречи одноклассников или друзей (vk.com, ok.ru, facebook.com), бизнес-сети или медицинская консультация посредством сетей. Пользователи выходят в Интернет с помощью рабочего компьютера или с мобильного телефона, на занятиях в школах и университетах, на работе и дома. В рунете 59% всех пользователей Интернета проводят время в социальных сетях [1].

Социальные сети признаются самым успешным интернет-стартапом за последнее десятилетие как в России, так и за рубежом.