

DIGITAL TRANSFORMATION OF MODERN CORPORATION MANAGEMENT TOOLS: THE CURRENT STATE AND DEVELOPMENT PATHS**

Vasiliy A. Laptev¹, Sergey Yu. Chucha², Daria R. Feyzrakhmanova³

¹ *Kutafin Moscow State Law University (MSAL), Moscow, Russia*

² *Institute of State and Law of the Russian Academy of Sciences, Moscow, Russia*

³ *Deposit Insurance Agency, Moscow, Russia*

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The subject. Digital technologies have been integrated into all aspects of public life, including politics, law, finance, business, education, science, and society. Yet, digitalization exerts an even greater impact on the economy, which should prompt the State, represented by its legislative and executive bodies, to take timely action to ensure the legal regulation of diverse aspects of the digital economy. Digital transformation of the economy has redefined the approaches to the issues of legal capacity, corporate governance and management of business processes. Traditional management mechanisms are no longer competitive, unless used in conjunction with dynamically developing digital technologies.

This article explores the issues related to digital legal personality of a corporation (online registration (e-residency) of corporations and the digital footprint that companies leave in public registers), digital corporate governance, and discuss the operation of digital corporations, including networked and decentralized autonomous organizations. The authors distinguish three types of digital corporate governance: remote management (exercised by human individuals), smart management (based on algorithms designed by human engineers), and artificial intelligence (AI) management (that does not require human involvement). Some tools of digital corporation management are illustrated, replacing traditional forms of management of the human cognitive system. Finally, we provide an overview of the operational characteristics of decentralized autonomous organizations.

Purpose of the research. This article is devoted to the transformation of management tools for modern corporations in the digital economy. In order to comply with the Russian corporate legislation of the existing digital reality, it is necessary to develop a comprehensive scientific and legal concept of corporate governance, ensuring the balance and protection of the rights and legitimate interests of all participants in corporate relations and others related to corporate relations, as well as increasing the transparency and efficiency of corporations.

Methodology. The methodology of this study was based on the following methods of scientific knowledge: general scientific empirical methods (observation (over the course of development of the use of digital technologies in corporate law), comparison (of the effectiveness of the use of digital technologies in corporate law of different countries)); methods of theoretical knowledge (analysis (of advantages and disadvantages of digitalization of individual institutions of corporate law), formal legal method (in the formulation and research of various concepts, determination of their characteristics and classification), theoretical modeling (of the prospects and areas of possible application of digital technologies in corporate law).

The main results. Digitalization of corporate management is bound to increase business profitability and improve competitiveness on the market. We believe that in the coming years science will have to tackle the issues of assessing the implications of the introduction of digital technologies, determining technical, economic and legal prerequisites for their implementation, and identifying their limits. In addition, issues related to professional training / retraining of personnel capable of working with modern technologies are of importance.

Conclusions. The authors came to the conclusion that the main direction of improving corporate legislation in the context of digitalization is currently the creation and provision of conditions for effective interaction between corporate actors and persons directly associated with them in the digital environment.

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1. Introduction

Digitalization sweeping through the various sectors of public life currently represents one of the most popular research topics or, as some scholars refer to it, a megatrend [2, 26]. Yet, digitalization exerts an even greater impact on the economy, which should prompt the State, represented by its legislative and executive bodies, to take timely action to ensure the legal regulation of diverse aspects of the digital economy. In turn, the state can involve citizens and their initiatives in resolving these issues, i.e. the organized public, interacting with public authorities, can take part in the legal regulation of various aspects of the digital economy [19].

Most efforts aimed at improving corporate legislation in the context of digitalization are currently focused on creating and promoting a digital environment that would ensure effective interaction between corporate actors and persons directly associated with them.

The application of digital technologies for corporate governance and maintenance of electronic records increases the efficiency of corporations, optimizes their business processes and facilitates interaction of corporate members with each other, as well as with third parties [30, 31]. However, as demonstrated by Ichak Adizes [1], corporations can benefit from the adoption of digital technologies throughout their entire life cycle [17]. For example, they can be used at the stage of creating a corporation and endowing it with legal personality.

The term “digital corporation” is used in two different meanings, depending on the context. According to the first one, a digital corporation is viewed as a participant in economic relations (an economic entity) whose management processes are carried out with the help of automated digital technologies, which render human intervention in corporate management virtually unnecessary. According to the second one, a digital corporation is defined as a technologically uniform digital organism, whose automated internal ecosystem provides for automated management of business processes.

The common understanding of a corporation as an association of persons (shareholders, participants) and the blending of capital (private equity fund) [3] may have to be revised once certain aspects of corporate management are delegated to the digital algorithms and are transformed into the digital code [7].

As a result of the introduction of digital technologies into corporate relations, the institution of property and the mechanisms for managing corporate capital have also started undergoing transformation [12].

This research reveals new opportunities for corporate management in the era of digital transformation of the economy in Russia. Approaches to the economic and legal aspects of the consequences of introducing digital technologies into traditional corporate management at the present stage are determined.

2. Digital Legal Personality of a Corporation

2.1. Online registration (e-residency) of corporations. On April 25, 2018, the reform of European Union law on companies began to implement the previously adopted Digital Single Market Strategy by the European Commission. The changes are primarily aimed at enabling the online registration of companies without contacting the relevant authorities or competent persons. The main purpose of introducing online registration of companies is to speed up the process of its creation and registration (within 5 working days).

On June 20, 2019, the European Parliament and the Council of the European Union decided to amend the existing Directive (EU) No 2017/1132 on certain aspects of corporate law with regard to the rules and procedures for the formation of companies, the registration of branches and the submission of documents and information by companies and branches (“online procedures”) by issuing Directive (EU) No 2019/1151.

Thus, according to the provisions of this Directive, Member States are required to establish procedures that allow the formation of companies, register branches and submit documents and

information completely online. However, for certain types of companies, exceptions may be provided in national legislation that restrict the application of the online registration procedure when they are created.

In addition, the provisions of the Directive prohibit Member States from establishing in national law the requirement to obtain a prior permit or license for the online registration of a company, unless this is due to the specifics of its activity.

However, the online registration of a corporation does not preclude the participation of notaries and lawyers in order to provide verification of identity and legal capacity of persons who are going to establish a company, register a branch, or submit relevant documents or information to government authorities. However, such participation should not prevent the completion of the procedure in its entirety online.

An example is the experience of Estonia, which is the first country in the world to offer international digital residency (e-residency)¹. Thus, the use of electronic technologies allows Estonian residents to vote online, draw up documents via the Internet, and register a business remotely. An individual who has registered in the prescribed manner and received an appropriate ID-card can register and manage a company online from anywhere in the world, as well as use online banking services, electronically declare income received, sign documents and conclude contracts using an electronic digital signature.

In the Russian Federation, the introduction of a digital residency regime involves making changes to the current legislation that provide for the possibility of registering organizations in a notification electronic form through the Gosuslugi portal.

2.2 Digital footprint of companies in public registers. In corporate practice, the legal personality of an organization is confirmed by the legal fact that a state body enters into the relevant state register information about the creation of a new corporation, including as a result of the reorganization of an existing. In the Russian

Federation, such a register is called the Unified State Register of Legal Entities, and the functions of maintaining it are assigned to the tax authority.

Each country or region has its own Trade Registers, which contain information on the legal status of companies of various organizational and legal forms. Thus, within the framework of the European Union, the European Business Registers Association (EBRA)² was established in April 2019, which manages the European Business Registers Network (EBR), which contains summary information about companies operating in 22 European countries.

The maintenance of Trade Registers in European countries is provided by various public authorities. So, for example, in Austria, the functions of maintaining the register are assigned to authorized district courts³, in Germany - to the German Ministry of Justice and authorized district courts⁴, in Belgium - to the Federal Public Service for the Economy of Belgium, in France - to authorized commercial courts (however, the register itself is maintained and maintained by a commercial company)⁵, etc.

The purpose of creating and maintaining Trade Registers containing information about the legal status of legal entities engaged in entrepreneurial and (or) other economic activities in a particular state is to ensure legal certainty in economic legal relations and economic turnover, as well as to provide access to general and actual information nature of the composition of legal entities.

In addition, some information about the economic activities of legal entities can be found in other open sources. For example, financial reports of Austrian companies are published on the website of the daily state publication Wiener Zeitung⁶,

¹ Republic of Estonia E-residency. URL: <https://e-resident.gov.ee> (accessed 10 September 2021).
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² European Business Registry Association. URL: <https://ebra.be> (accessed 10 September 2021).

³ Firmenbuch Österreich. URL: <https://firmenbuch.at> (accessed 10 September 2021).

⁴ Unternehmensregister. URL: <https://www.unternehmensregister.de> (accessed 10 September 2021).

⁵ Infogreffe. URL: <https://www.infogreffe.com> (accessed 10 September 2021).

⁶ Wiener Zeitung. URL: <http://www.wienerzeitung.at/> (accessed 10 September 2021).

accounting information of active Belgian companies, associations and funds - on the website of the National Bank of Belgium⁷, information of disqualified directors of English companies - on the website of the Companies House⁸.

In the Russian Federation, material facts of a corporation is subject to disclosure on the Internet portal "Center for the Disclosure of Corporate Information"⁹, administered by Interfax. The facts subject to public disclosure include information about concluded transactions, securities issues, income payments, performance of obligations, decisions made by the governing body of an issuer (corporation), etc.

Information about special economic competences of certain Russian legal entities is also maintained in public registers. For example, in the construction sector, such information is aggregated on the online portals of the National Association of Builders (<https://nostroy.ru/>) and the National Association of Surveyors and Design Engineers (<http://nopriz.ru/>).

2.3. A unified space of trust is a digital environment that ensures the recognition of an electronic signature of an economic entity on documents certifying all types of economic and legal relations. The creation of a unified space of trust is the goal that unites the states on all continents, since the market for the majority of goods and services is transnational in its nature.

The formation of the digital space of trust on the Eurasian continent began at the end of the 20th century with the initiative of the European Union (Directive 1999/93/EC of the European Parliament and of the Council of December 13, 1999 on a Community Framework for Electronic Signatures). In Russia, the unified space of trust started to form a little over a decade ago, and the approaches to its creation were reflected in the Concept for the Development of Mechanisms for

the Provision of State and Municipal Services in Electronic Form (Order of the Government of the Russian Federation No. 2516-r of December 25, 2013) and in the National Program of the Russian Federation "The Information Society" (Resolution of the Government of the Russian Federation No. 313 of April 15, 2014). Within the Eurasian Economic Union, the cross-border space of trust is regulated by the Protocol on Information and Communication Technologies and Information Exchange (Appendix No. 3 to the Agreement on the Eurasian Economic Union of May 29, 2014).

In Russia, the procurement of goods and services for the needs of the government and companies with state participation is carried out through the federal contract system that was introduced almost a decade ago (Federal Laws No. 44-FZ of April 5, 2013 "On the Contract System in the Procurement of Goods, Works and Services for State and Municipal Needs" and No. 223-FZ of July 18, 2011 "On the Procurement of Goods, Works and Services by Certain Types of Legal Entities"), specifically, via such online platforms as RTS-Tender (<http://rts-tender.ru/>), National Electronic Platform (former MICEX Electronic Trading Platform, www.etp-ets.ru), Unified Electronic Trading Platform (www.roseltorg.ru), etc. According to the Unified Procurement Information System (<https://zakupki.gov.ru/>), goods and services purchased on digital platforms through the federal contract system account for a substantial share of GDP.

2.4. The digital afterlife of a corporation is the exercise of its legal capacity that exceeds the lifespan of its members. Modern information technologies provide for the automatic (algorithmic) implementation of economic policies, production activities and business operations. This allows to claim that corporations possess "digital immortality", since they can continue to exercise their legal capacity regardless of who their current members (shareholders) are, until this capacity is overruled by a computer program. The main task of the legislator in this regard is to regulate the possibility of digital conservation of part or the whole of the company's business, not only in economic terms, but also legally, since the corporation, as a legal entity, cannot suspend its

⁷ National Bank of Belgium. URL: <https://www.nbb.be/en/central-balance-sheet-office> (accessed 10 September 2021).

⁸ Government Digital Service UK. URL: <https://www.gov.uk/government/organisations/companies-house> (accessed 10 September 2021).

⁹ Center for the Disclosure of Corporate Information. URL: <https://e-disclosure.ru> (accessed 10 September 2021).

activities and carries out it continuously, reflecting it in accounting and tax reporting. all business transactions of the corporation. This approach seems to be effective in various crisis situations (including environmental disasters and epidemiological outbreaks).

3. Digital Corporate Governance

Traditional corporate governance models can be divided into two groups: basic (outsider, insider) and special (directive, beneficial, "impersonal", etc.). Each of these models of corporate governance involves the use of appropriate components [4; 8; 9, p. 15-16]. It seems that in the near future digital technologies will significantly reduce time and transaction costs in corporate management procedures.

Depending on the degree of human involvement in managerial decisions and the level of automation of management processes, three different types of digital corporate governance can be identified: remote management (governance), smart management (governance) and AI management (governance).

3.1. Remote management (governance) involves the use of tools aimed at the remote participation of a person (for example, a shareholder, general director or a member of the board of directors of a corporation) in making and executing management decisions. Among the means of remote control, one can single out an electronic signature, videoconferencing, electronic voting, corporate management biometrics, international language (multilanguage), legal tech, etc.

Electronic signatures. In corporate practice, the following documents can be signed with an electronic signature: notification of a general meeting of shareholders (participants), notification of a shareholder to a non-public joint-stock company of the intention to sell shares to a third party, notification of the company's creditors about its reorganization, liquidation or reduction of the authorized capital, notification of a shareholder to his company on the fact of concluding a shareholder agreement, etc.). An electronic document allows you to reduce the time of sending a legally significant message and the cost of making

it.

In addition, the use of an electronic signature makes it possible to ensure transparency in the processes of working with documents, as well as to reduce the time for access to documentation and their execution in departments.

Videoconferencing during meetings. In the context of the worldwide spread of a new coronavirus infection (COVID-19), the use of videoconferencing technology during meetings seems to be relevant and highly in demand.

The use of videoconferencing technology seems to be effective when holding meetings (meetings): a general meeting of shareholders (participants), a board of directors, a collegial executive body (management board, directorate), meetings of the heads of the parent and subsidiaries, and other internal corporate meetings (sessions).

The provisions of the current Russian legislation allow the use of digital technologies when holding general meetings of shareholders, participants in limited liability companies and members of non-profit organizations (clause 1, article 181.2 of the Civil Code of the Russian Federation). It is the holding of remote face-to-face general meetings via videoconferencing that will allow the participants of the corporation not only to form and express their will by voting, but also to take part in shaping the will of other participants in the meeting [27, p. 11].

In the context of the ongoing pandemic, the use of videoconferencing technology in corporate governance is a relevant and promising way of interaction between corporation members not only in Russia but also abroad. For example, in the US in March 2020, Starbucks Corp. held its first fully virtual shareholder meeting¹⁰. To conduct this meeting, the Virtual Shareholder Meeting¹¹ platform was used, which allows shareholders to directly

¹⁰ Starbucks to hold AGM virtually due to coronavirus. URL:

<https://www.vedomosti.ru/business/news/2020/03/04/824468-starbucks-godovoe-sobranie> (accessed 1 September 2021).

¹¹ Virtual Shareholder Meeting platform. URL: <https://www.broadridge.com/financial-services/corporate-issuer/issuer/simplify-the-annual-meeting-process/virtual-shareholder-meeting/> (accessed 1 September 2021).

participate in the meeting and vote on issues included in the agenda.

On March 18, 2020, the Italian government adopted a new decree that includes measures to support businesses and families in the face of the spread of the novel coronavirus infection (COVID-19)¹². According to this decree, in 2020, all general meetings of corporation participants must be held via remote participation, i.e. using videoconferencing systems or electronic voting, subject to the identification of participants, their real participation and guaranteed exercise of the right to vote, or absentee voting. However, the secretary or notary who controls the meeting and draws up the minutes must be in the place provided for the meeting (indicated in the notice of the meeting) together with the person or persons exercising the function of the counting commission.

It should be noted that the general meeting of corporation participants held remotely via videoconference will be valid only if the following conditions are met: the identification of persons participating in the meeting, uninterrupted broadcasting, the possibility of fixing the decisions taken at such a meeting in electronic form and respecting the interests of all participants [14, p. 84].

General meeting of participants on the blockchain platform. Blockchain technology is an accessible distributed database that records information about all transactions made by system participants [6; 15, p. 213]. In Russian jurisprudence, blockchain is also considered as a way of fixing rights [10; 16].

The main goal of introducing blockchain technology into the voting process is to solve the problem of the involvement of corporation participants in the process of managing it, as well as to reduce the costs associated with holding a general meeting. Unlike the traditional form of voting, voting on the blockchain platform does not require the personal participation of shareholders in the meeting, they can take part in it remotely by

using their personal account on the Internet, as well as check in real time how their vote was taken into account.

The voting process on a blockchain platform can be implemented as follows: 1) formation of the agenda of the meeting; 2) uploading issues included in the agenda of the meeting to the blockchain; 3) notification of participants about the date and time of voting; 4) issuance of tokens ("voice coins") by the number of shares in the corporation and distribution in the relevant parts among shareholders by crediting to an electronic wallet; 5) voting - the direction by the shareholders of the tokens distributed by them to other electronic wallets, denoting respectively "for", "against", "abstained"; 6) summing up the voting results.

For the first time, electronic voting on the blockchain platform was carried out by the American company Nasdaq, which in 2017 launched a corresponding project in Estonia¹³ and South Africa¹⁴.

In Russia, holding electronic voting on the blockchain platform is provided by the National Settlement Depository, which uses a distributed ledger based on Hyperledger Fabric, which allows for the secure processing of electronic interaction between securities holders and issuers when exchanging information during the annual meetings of securities holders.

It should be noted that the Center for Distributed Registry Technologies of St. Petersburg State University has developed a blockchain system for remote corporate voting¹⁵. The CryptoVeche corporate voting application can be used in all areas of activity that require the creation of a trusted and secure environment for voting.

It seems that the use of blockchain technology in electronic voting will improve

¹² COVID-19: «Cura Italia» Decree Enacted // URL: <https://www.bakermckenzie.com/en/insight/publications/2020/03/covid19-cura-italia-decree-enacted> (accessed 1 September 2021).

¹³ e-Estonia // URL: <https://e-estonia.com/e-residency-to-support-nasdaq-in-transforming-shareholder-participation/> (accessed 10 September 2021).

¹⁴ Nasdaq // URL: <http://ir.nasdaq.com/releasedetail.cfm?releaseid=1049610> ((accessed 10 September 2021).

¹⁵ Federal State Budgetary Educational Institution of Higher Education "Saint Petersburg State University" // URL: <https://spbu.ru/news-events/novosti/v-spbgu-razrabotali-blokcheyn-sistemu-dlya-udalennogo-korporativnogo> (accessed 20 September 2021).

corporate governance mechanisms by creating an effective, trustworthy, immutable and verifiable voting system that ensures transparency and increases interaction with shareholders.

Electronic voting (e-voting). The electronic voting service (e-voting) is a convenient universal tool for voting at general meetings of corporation participants, which allows participants to register at meetings and vote by filling out an electronic ballot form on the website, watch the webcast of the meeting, get acquainted with the agenda and materials of the meeting, using remote identification using a verified account on the State Services Portal.

Electronic voting can be carried out both with the use of distributed registry technology and without it [27]. In Russia, registrars offer to carry out electronic voting without using distributed registry technology (JSC VTB Registrar, JSC Registry, JSC New Registry, etc.).

In the USA, questions about the form of holding meetings of shareholders are resolved in each state individually, the first electronic voting was held in 2009 by Intel, and other players in the IT and telecommunications market followed. In turn, for example, in Turkey, since 2012, it has been legally established to conduct electronic voting at meetings of shareholders of public companies.

One of the main advantages of e-voting is its ease of use by all corporate members, since access to electronic platforms on which e-voting is carried out is provided through a URL or an application. Authentication of shareholders (participants) in the electronic voting system can occur as follows: using the account of the State Services portal, using an unqualified electronic signature, using a login and password, using a qualified electronic signature. Next, the participant's personal account is registered on the platform on which electronic voting will be carried out. In the personal account, the shareholder (participant) can get acquainted with the materials of the upcoming voting, directly vote for a particular decision, being anywhere in the world, and also get acquainted with the voting results.

Similar to blockchain technology, electronic voting allows increasing the quorum of

the meeting by increasing the involvement of shareholders (participants) in the voting process and corporate governance in general, speeding up the process of processing and counting votes, and eliminating possible errors and third-party interference when counting votes.

In our opinion, it seems possible to use the electronic voting system not only when holding general meetings of corporation participants, but also to extend it to all other types of collective decision-making, i.e. introduce into practice electronic voting of members of the board of directors, etc.

Biometric identification of corporate managers. In large corporations with many employees, in conditions of staff turnover and periodic management changes, it becomes necessary to conduct remote (online) meetings or face identification meetings, i.e. establishing the fact of sending the will of a specific person - the bearer of managerial competencies.

Biometric personal data is information that characterizes the physiological and biological characteristics of a person, allowing to establish his identity (Article 11 of the Federal Law of July 27, 2006 No. 152-FZ "On Personal Data").

It is known that the concepts of transition to electronic passports of citizens of the Russian Federation proposed by Rostelecom, Goznak and Research Institute "Voskhod" will be based on the use of biometric information¹⁶. It seems that this experience will be effective when applied in corporate procedures.

International language. For companies operating on all continents (for example, DHL or Shell), communication with business partners in various languages is required. In this regard, IT programs will be a serious assistant, allowing you to automatically translate the speech of employees or members of the corporate management bodies into the appropriate language, in particular, during corporate events (regular and extraordinary meetings of shareholders, meetings of the board of directors or any kind of working meetings).

¹⁶ Kalyukov E., Posypkina A. (2019) Paper passports in Russia will stop issuing in 2022 // URL: <https://www.rbc.ru/society/17/07/2019/5d2f31279a79470aabab20d0> (accessed 20 September 2021).

Legal tech. A new line of business has become the implementation of professional legal activities using information technology. Corporations form legal departments (departments, departments) that ensure the normal operation of the organization and corporate compliance. According to the Law 360 portal, 3.6 billion US dollars were invested in start-ups and companies in the field of legal tech around the world, which indicates the investment attractiveness and demand for this direction. Examples of legal tech projects include the following. The Russian startup UR-LI has developed a system for checking tax reporting and assessing the risks of collecting receivables. The Clara English service allows you to automate many of the processes associated with the creation of companies in different jurisdictions, as well as draw up contracts, capitalization tables and organize corporate document repositories. The α -ICON network algorithm developed by Russian specialists makes it possible to identify and rank the ultimate owners of various companies based on data contained in public registers of legal entities.

Legal tech tools successfully work in conjunction with artificial intelligence (AI), the work of which will be disclosed later.

3.2. Smart management (governance), in turn, is based on the use of tools for automatically managing a corporation according to pre-established algorithms without human intervention, but suggesting the possibility of their adjustment and modification during the program's operation. Thus, two types of smart management can be distinguished: corporate affairs management (i.e. internal corporate procedures) and activity management (internal production procedures, contracts and their execution).

As part of managing the affairs of a corporation, it will be promising to introduce a system of smart management of a corporation, taking into account the norms of corporate law governing the decision-making procedure and the underlying algorithms. Initially, it is required to conscientiously prescribe algorithms and variability of managerial decisions in the smart program. In turn, activity management allows you to automate

managerial decision-making based on the analysis of past experience and forecasting the development of events in order to choose the best direction, including agile coaching.

Smart management (governance) can be successfully used in the following areas: distribution of competence between performers (company employees); creation of effective teams in the company; training and adaptation to the dynamics of market changes; formation and adjustment of internal labor regulations; order and instructions for labor protection, etc.

Information technologies allow not only to reduce the time for decision-making and automate it, but also to suggest the “right” and effective decision. In this direction, software solutions (smart solutions) are being developed that allow taking into account market sensitivity, legislative regulation and other factors (for example, BoardMaps, ITI Capital and other analogues).

3.3. AI-management (governance) is the adoption by machine (artificial) intelligence of managerial decisions that were not previously included in the program, excluding the human factor (cyber business partner). One of the most promising areas in the field of management will be artificial intelligence, capable of making independent management decisions in isolation from human thinking [11]. Reduced decision-making time, lack of emotional impact and rapid assessment of many factors (for example, Big data information) put AI management tools in the forefront, not giving alternative tools a chance to compete.

According to a Gartner survey conducted at the end of 2020 among 200 business leaders and IT professionals, during the COVID-19 pandemic, 24% of organizations increased their investments in artificial intelligence, and 42% remained at the same level. These circumstances indicate that the traditional (existing) management tools have long been mastered by business, and the economy needs a new round of development.

The introduction of artificial intelligence into the corporate governance process seems justified as an assistant capable of processing a large amount of information in a short period of time and assessing possible risks when members of the board of directors make decisions that are strategically

important for the corporation, approve transactions, etc., an error in making which can lead to decrease in the financial stability of the corporation and even its bankruptcy [28].

So, in 2014, Deep Knowledge Ventures¹⁷, a Hong Kong venture fund specializing in life extension technologies, included a self-learning computer program (Vital (Validating Investment Tool for Advancing Life Sciences)) to the board of directors. The main objective of this program was to analyze the financial performance of medical start-ups that may be of interest to a Hong Kong company. The algorithm was given, relatively speaking, a "voice" on the issue of investment in a particular project or not, but Vital did not have the status of a director in a legal sense.

Project indicators were evaluated simultaneously by members of the board of directors and directly by artificial intelligence. In case of coincidence of votes, the project was accepted, and if the opinions of the members of the board of directors and the program differed, then the analysis of the project indicators was carried out taking into account the new information provided by artificial intelligence, and voting was carried out until the disagreements were settled.

The following platforms can be cited as examples of the use of artificial intelligence in corporate governance. Using the Cloverleaf¹⁸ platform will help the project manager form an optimal and effective team to achieve the goals and objectives, since the program compares the personal qualities and skills of the project team members, complementing the functions of an HR specialist.

A similar platform is PineStem¹⁹, but its functionality is not limited to assisting in the formation of teams for the implementation of relevant corporation projects, but also includes functions for tracking the progress of projects,

daily informing team members about the work done and determining the performance of a particular team.

In early 2017, Allan Rocha and Ricardo Vargas introduced the PMOtto²⁰ virtual assistant service, which is a chatbot that interacts with project management systems and project portfolios, such as Microsoft Office 365 Project Online. This program recognizes speech and text, and converts it into commands for information systems, and can also make recommendations for the implementation of the project, based on the results of machine learning and the algorithms implemented in it.

The digital intelligent assistant Autodesk Construction IQ²¹, using machine learning methods, analyzes data on the quality and safety of construction objects, possible risks of the project. The results of such an analysis are transmitted to the users of the program, who, based on such results, make appropriate management decisions.

Digitizing the brains of participants in intra-corporate relations. The possibility of uploading the cognition of a company's participant (its CEO, shareholder or member of the board of directors) into a computer today sounds like an obscure and distant future. Yet, such a future would provide for the possibility of managing corporations by means of "digital thoughts". This would imply extracting from the human brain not only its problem-solving strategies, but also cognitive styles, personal preferences and business ideas regarding corporate governance.

The digitization of the human brain would result in the "digital immortality" of the human cognition, that would continue as long as its digital blueprint exists on a magnetic medium or in cloud storage (e.g., corporate cloud storage).

4. Documenting the Outcome of Production and Economic Activities and Corporate Compliance

¹⁷ Deep knowledge ventures. URL: <http://www.deepknowledgeventures.com> (accessed 1 September 2021).

¹⁸ Cloverleaf. URL: <https://cloverleaf.me> (accessed 10 September 2021).

¹⁹ PineStem. URL: <https://www.capterra.com/p/166803/PineStem> (accessed 10 September 2021).

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²⁰ PMOtto – Your Personal Project Management Assistant. URL: <https://ricardo-vargas.com/special-projects/pmotto/> (accessed 10 September 2021).

²¹ Autodesk Construction IQ. URL: <https://www.autodesk.ru/press-releases/2019-03-25> (accessed 10 September 2021).

Information about the results of the production and economic activities of the corporation is reflected in many electronic databases administered by various government agencies and non-governmental organizations, such as the Transparent Business service (<https://pb.nalog.ru/index.html>), a service and a mobile application "Verification of Cashier's Checks", service "Stamp Verification" (<https://public.fsrar.ru/checkmark>) and the mobile application "Anti-Counterfeit Alco", the information portal "Register of Self-Regulatory Organizations" and "Register of members of Self-Regulatory Organizations" (<http://reestr.nostroy.ru/>) and others.

The electronic information contained in the above-mentioned services, in its totality, represents a kind of analogue of Big Data with the only difference that the information provided is structured and can be the basis of corporate compliance, which allows managing the risks of the corporation's compliance with the requirements and rules of law.

The electronic data of each service (Internet portal) is stored autonomously on the servers of the relevant state bodies and non-governmental organizations and is not integrated with each other.

It is known that Russia has adopted the Concept for the Creation and Operation of a National Data Management System (Decree of the Government of the Russian Federation of June 3, 2019 No. 1189-r), it is expected to reduce the volume of statistical and tax reporting of corporations, since the process of digitizing information and SMEV provided access to data from the federal executive authorities.

It is proposed to create a single cloud of data on the activities of corporations. The cloud data infrastructure must be provided with a clear data architecture, which will be accessible to the competent public authorities, of course, provided that the information received is kept confidential.

Corporate digital compliance helps to assess the corporation's tolerance for economic mistakes and the ability to adapt to changes in market conditions, as well as to regulatory aspects in the country's economy as a whole.

Currently, existing information technologies allow corporations to submit financial statements through the State Services portal (<https://www.gosuslugi.ru/>). In the scientific literature, there is a position about the inappropriateness of accounting by a person (accountant) and the need to transfer this functionality to artificial intelligence, since information that is the subject of accounting can be processed without human participation [13].

Most of the digital information is held by the state and the constituent entities of the Russian Federation, for example, information about the presence of a corporation of real estate (land plots and buildings / structures in the Unified State Register of Real Estate of The Federal Service for State Registration, Cadastre and Cartography), about the founders of legal entities and about the owners of shares in the authorized capital of companies (Unified State Register of Legal Entities of Federal Tax Service of Russia), vehicles (traffic police base). A number of information is stored in non-governmental organizations, for example, self-regulatory organizations (information about Self-Regulatory Organizations members) or registrars (owners of the issuer's shares).

5. Decentralized Autonomous Organizations

The process of digitalization of the economy also affects the change in the organizational structure of corporations, which leads to the emergence of new participants in corporate relations.

It should be noted that at present there are already technological possibilities for creating so-called decentralized autonomous corporations, controlled by a set of self-executing smart contracts [22]. Such organizations can be implemented in a real-life corporation or by creating a quasi-corporation in the digital space, where all processes, including management and interaction of participants (members), are decentralized and automated [18, p. 32].

Decentralized autonomous organizations are understood as a new form of corporate governance that uses tokenized tradable shares as a

means of paying dividends to shareholders [17]. Such corporations operate without any human involvement.

Decentralized autonomous organization tokens perform various roles [5]. So, they are shares of a digital corporation, certifying the scope of the corporate rights of an individual participant; digital assets; private money (within the organization they can perform the functions of a measure of value, means of circulation, means of payment, means of accumulation and world money (due to blockchain and smart contracts); social rating of the organization.

The following definitions of a decentralized autonomous organization are found in the literature. Thus, Vitalik Buterin defines a decentralized autonomous organization as a virtual organization that has a certain composition of participants or shareholders who have the right to dispose of the organization's property and change its program code [23].

Some of the most popular decentralized autonomous organization platforms such as DAOstack and Aragon define a decentralized organization as “a network of stakeholders without a central governing body”²² “which is governed by a set of automatically applied rules on a public blockchain”²³ (<https://aragon.org/dao>).

The hallmarks of decentralized autonomous organizations are:

- a decentralized autonomous organization allows people to coordinate their actions and provide self-government in the network [20, p. 222; 29, p. 118];

- the code of the smart contract, on the basis of which the decentralized autonomous organization operates, determines the rules of interaction between the participants [24, p. 12];

- since the rules of interaction between the participants of a decentralized autonomous organization are defined using smart contracts, they are executed independently, regardless of the will of the parties [24, p. 146];

- management of a decentralized

autonomous organization should remain independent of centralized control [25, p. 2];

- since decentralized autonomous organizations operate on the basis of blockchain technology, they have the following characteristics: transparency, cryptographic security and decentralization [21, p. 57].

The main idea of creating a decentralized autonomous organization is to ensure the management of a corporation without human participation, i.e. as a result of the execution of a set of business rules developed and generated in a specific service (software). Through the use of smart contracts, token owners (members of a decentralized autonomous organization) alienate the assets of the organization, distribute profits, receive information about the activities of the corporation, etc. In addition, participants, through voting, can make changes to smart contracts, on the basis of which there is a decentralized organization. Thus, we can conclude that a decentralized autonomous organization is a digital form of existing organizations, based on smart contracts and tokens instead of constituent documents and shares.

There is no owner or central authority in a decentralized autonomous organization. The management of a decentralized autonomous organization is carried out by a group of people united by a common goal - the miners who keep the system working.

Examples of decentralized organizations include the following. Currently, decentralized autonomous organizations mainly operate in the space of blockchain and cryptocurrencies. For example, the decentralized collateral financing platform Maker DAO is the most well-known decentralized organization. The main function of Maker DAO is lending and lending cryptocurrencies without the involvement of an intermediary.

In addition, the leading decentralized exchanges Uniswap, Compound and SushiSwap are also managed decentralized through the use of UNI, COMP and SUSHI tokens by participants.

The main advantage of decentralized autonomous organizations is that the use of distributed ledger technology and smart contracts make it possible to ensure the involvement of the participants of such an organization in the process of

²² DAOstack. URL: <https://daostack.io> (accessed 10 September 2021).

²³ Aragon. URL: <https://aragon.org/dao> (accessed 10 September 2021).

making managerial decisions, the transparency of voting and vote counting. Transparency lies in the fact that all significant events, including corporate decisions made and corporation transactions, are recorded and stored in the block chain in the blockchain, and relations between participants are regulated through smart contracts, which helps to reduce the risk of introducing corporation members and other persons astray.

In decentralized autonomous organizations, participants have the opportunity to directly manage its assets, as well as exercise control over them, which greatly simplifies the organization of corporate governance. In such organizations, there is no traditional management hierarchy; all members of the corporation, without exception, can take part in management. If any participant lacks competence in resolving a particular issue, he can delegate the right to vote to another more competent participant, i.e. in such an organization, decisions will be made by qualified specialists.

Another advantage of decentralized organizations is the ability to independently create a digital corporation without contacting the relevant government agencies and developing constituent documents. Currently, such organizations are registered and operate outside of jurisdictions, which is also seen as an advantage, since a digital organization cannot be closed or suspended.

However, in addition to the advantages, decentralized autonomous organizations also have disadvantages: the impossibility of quickly eliminating errors in smart contracts, the difficulty of obtaining data from outside, the difficulty of maintaining the confidentiality of information within the organization, regulatory pressure on the crypto assets market, etc.

6. Conclusion

The previously considered individual aspects of the digital transformation of the management tools of modern corporations indicate the active introduction of information technologies into the economy.

The result of the digital transformation of management tools for modern corporations will be

an increase in business profitability and competitiveness in the market. It seems that the task of modern science in the coming years should be to assess the consequences of the introduction of these technologies, formulate the technical and economic and legal conditions for implementation, and establish the limits of their use. In addition, issues related to professional training / retraining of personnel capable of working with modern technologies are of importance.

The use of digital technologies in corporate governance makes it possible to ensure the balance and protection of the rights and interests of all participants in corporate relations and others related to corporate ones, increases the efficiency and transparency of the corporation's activities, and also ensures high competitiveness.

REFERENCES

1. Vaypan V.A. Fundamentals of legal regulation of the digital economy. *Pravo i ekonomika. Dokumenty. Kommentarii. Praktika = Law and Economics. Documentation. Comments. Practice*, 2017, no. 11, pp. 5–18. (In Russ.).
2. Laptev V., Fedin V. Legal awareness in a digital society. *Russian Law Journal*, 2020, vol. VIII, iss 1, pp. 138–157. DOI: 10.17589/2309-8678-2020-8-1-138-157.
3. Chucha S.Yu. Social dialogue in Russia: constitutionalization and expanding the legal content of the concept. *Pravoprimeniye = Law Enforcement Review*, 2021, vol. 5, no. 3, pp. 249–261. DOI: 10.52468/2542-1514.2021.5(3). 249-261. (In Russ.).
4. Vermeulen E.P.M. *Corporate governance in a networked age*, Lex Research Topics in Corporate Law & Economics Working Paper No. 2015-4. 10 Aug 2015. 25 p. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2641441.
5. Yermack D. *Corporate governance and blockchains*, NBER Working Paper No. w21802. 14 Dec 2015. 41 p. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2703207.
6. Adizes I.K. *Managing corporate lifecycles: how organizations grow, age, and die*. Moscow, Mann, Ivanov and Ferber Publ., 2014. 512 p. (In Russ.).
7. Chekhovskaya S.A. Corporate electronic management and corporate management for electronic corporations: legal aspects. *Predprinimatel'skoe pravo = Business Law*, 2018, no. 4, pp. 3–11. (In Russ.).
8. Gafiyatov I.Z. The institutional nature of corporations in the modern Russian economy. *Rossiiskoe predprinimatel'stvo = Russian entrepreneurship*, 2007, vol. 8, no. 11, pp. 42–46. (In Russ.).
9. Kirillov D.V. Decentralised autonomous organisations as a new form of doing business in the digital economy. *Gumanitarnye nauki. Vestnik Finansovogo universiteta = Humanitarian sciences. Financial University Bulletin*, 2021, vol. 11, no. 2, pp. 30–34. DOI: 10.26794/2226-7867-2021-11-2-30-34. (In Russ.).
10. Loseva O.V., Tazikhina T.V., Fedotova M.A. Transformation of corporate governance and property relations in a digital society. *Upravlencheskie nauki = Management Sciences*, 2020, vol. 10, no. 1, pp. 55–67. DOI: 10.26794/2404-022X-2020-10-1-55-67. (In Russ.).
11. Guriev S.M., Lazareva O.V., Rachinskii A.A., Tsukhlo S.V. *Corporate governance in Russian firms*. Moscow, Institute for the Economy in Transition Publ., 2004. 92 p. (In Russ.).
12. Shitkina I.S. (ed.) *Corporate law*, Textbook. Moscow, Statut Publ., 2019. 735 p. (In Russ.).
13. Laptev V.A. *Corporate law: legal organization of corporate systems*, Monograph. Moscow, Prospekt Publ., 2020. 384 p. DOI 10.31085/9785392284238-2019-384. (In Russ.).
14. Laptev V., Feyzrakhmanova D. Digitalization of institutions of corporate law: current trends and future prospects. *Laws*, 2021, vol. 10 (93), pp. 1–19. DOI: 10.3390/laws10040093.
15. Feyzrakhmanova D.R. *Corporate conflicts and legal means of their resolution*, Cand. Diss., Moscow, 2020. 245 p. (In Russ.).
16. Egorova M.A., Belykh V.S., Reshetnikova S.B. The blockchain technology: application prospects and importance for the development of information-oriented society. *Yurist = Lawyer*, 2019, no. 7, pp. 4–9. DOI: 10.18572/1812-3929-2019-7-4-9. (In Russ.).
17. Feyzrakhmanova D.R. Distributed ledger technology. Public information registers, in: Laptev V.A., Tarasenko O.A. (eds.) *Tsifrovaya ekonomika: kontseptual'nye osnovy pravovogo regulirovaniya biznesa v Rossii*, Monograph, Moscow, Prospekt Publ., 2020, pp. 213–218. DOI: 10.31085/9785392328604-2020-488. (In Russ.).
18. Laptev V.A. Digital assets as objects of the civil rights. *Yuridicheskaya nauka i praktika: Vestnik Nizhegorodskoi akademii MVD Rossii = Legal Science and Practice: Bulletin of the Nizhny Novgorod Academy of the Ministry of Internal Affairs of Russia*, 2018, no. 2 (42), pp. 199–204. DOI 10.24411/2078-5356-2018-10031. (In Russ.).
19. Kharitonova Y.S. The legal effect of formalization of intellectual property rights through the use of distributed ledger technology. *Pravo i ekonomika = Law and Economics*, 2018, no. 1, pp. 15–21. (In Russ.).
20. Laptev V.A. Artificial intelligence and liability for its work. *Pravo. Zhurnal Vysshei shkoly ekonomiki = Law. Journal of the Higher School of Economics*, 2019, no. 2, pp. 79–102. DOI: 10.17-323/2072-8166.2019.2.79.102. (In Russ.).
21. Moslein F. Robots in the boardroom: artificial intelligence and corporate law, in: Barfield W., Pagallo U. (eds.) *Research Handbook on the Law of Artificial Intelligence*, Cheltenham, UK, Northampton, MA, Edward Elgar Publ., 2018, pp. 649–670.
22. Pankov V.V., Kozhukhov V.L. Intelligent technologies and the future of accountancy. *Mezhdunarodnyi bukhgalterskii uchet = International accounting*, 2020, no. 3, pp. 286–296. (In Russ.).

23. Blemus S. *Law and Blockchain: A legal perspective on current regulatory trends worldwide*, RTDF No. 4-2017. 11 Dec 2017. 15 p. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3080639.
24. Chekhovskaya S.A. New contours of corporate law. *Predprinimatel'skoe pravo = Business Law*, 2018, no. 3, pp. 31–41. (In Russ.).
25. Gutnikov O.V. Corporate law development trends at the present time. *Zhurnal rossiiskogo prava = Journal of Russian Law*, 2020, no. 8, pp. 59–73. DOI: 10.12737/jrl.2020.094. (In Russ.).
26. Buterin V. *Ethereum whitepaper: a next-generation smart contract and decentralized application platform*, Ethereum White Paper. 2013. 36 p. Available at: https://blockchainlab.com/pdf/Ethereum_white_paper-a_next_generation_smart_contract_and_decentralized_application_platform-vitalik-buterin.pdf.
27. Yankovskii R.M., Endutkin S. Corporate governance in the near future: decentralized companies ruled by algorithms?, in: Porshakov S. (ed.) *Natsional'nyi doklad po korporativnomu upravleniyu*, vol. XII, Moscow, 2020, pp. 206–235. (In Russ.).
28. Singh M., Kim S. Blockchain technology for decentralized autonomous organizations, in: Kim S., Deka G.C., Zhang P. (eds.) *Role of Blockchain technology in IoT Applications*, Advances in Computers, vol. 115, Elsevier Publ., 2019, pp. 115–140. DOI: 10.1016/bs.adcom.2019.06.001.
29. De Filippi P., Wright A. *Blockchain and the law: the rule of code*. Harvard University Press, 2018. 312 p.
30. Hsieh Y.Y., Vergne J.P., Anderson P., Lakhani K., Reitzig M. Bitcoin and the rise of decentralized autonomous organizations. *Journal of Organization Design*, 2018, vol. 7, iss. 1, pp. 1–16. DOI: 10.1186/s41469-018-0038-1.
31. Beck R. Beyond bitcoin: The rise of blockchain world. *Computer*, 2018, vol. 51, iss. 2, pp. 54–58. DOI: 10.1109/MC.2018.1451660.

INFORMATION ABOUT AUTHORS

Vasilii A. Laptev – Doctor of Law, Professor, Department of Entrepreneurial and Corporate Law
Kutafin Moscow State Law University (MSAL)
9, Sadovaya-Kudrinskaya ul., Moscow, 125993, Russia E-mail: laptev.va@gmail.com
ResearcherID: A-7888-2019 ORCID: 0000-0002-6495-1599
RSCI SPIN-code: 5776-0978; AuthorID: 364915

Sergey Yu. Chucha – Doctor of Law, Professor; Chief Researcher, Sector of Civil Law, Civil and Commercial Procedure; Head, Interdisciplinary Centre for Legal Research in Labor Law and Social Security Law
Institute of State and Law of the Russian Academy of Sciences
10, Znamenka ul., Moscow, 119019, Russia E-mail: chuchaigpan@gmail.com ResearcherID: AAB-6526-2021
ORCID: 0000-0001-5771-6323
RSCI SPIN-code: 6043-1045; AuthorID: 475874

Daria R. Feyzrakhmanova – PhD in Law, Senior Lawyer
Deposit Insurance Agency
4, Vysotskogo ul., Moscow, 109240, Russia
E-mail: daria.feyzrakhmanova@gmail.com
ORCID: 0000-0002-9254-4464
RSCI SPIN-code: 611-3906; AuthorID: 1092132

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