



## Digital transformation of enterprises: trends, factors, results

### Transformación digital de las empresas: tendencias, factores y resultados

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#### ABSTRACT

*Goals.* To identify methodological contradictions and inconsistencies between different approaches to measuring the digital economy as a whole, the digital transformation of enterprises; to assess the effectiveness of digital transformations, and to outline the contours of the modern paradigm of digital transformation management in the post-Covid world. *Results.* The changes in the conceptual approaches to the measurement of the digital economy and digital transformation due to new trends in the development of digital transformation have been revealed. It has been shown which factors and actions determine the results of the digital transformation of enterprises, based on which the modern paradigm of digital transformation management has been formed. The features of the national digital transformation strategy have been analyzed. *Conclusion.* In the new post-Covid reality, enterprises will change dramatically, and to achieve success they will need a new paradigm of digital transformation management, organically combining economic and social aspects, a strategic and operational approach, considering transformation management as a flexible self-learning ecosystem.

**Keywords:** Digital economy; Digital transformation; Trends; Factors; Results.

#### RESUMEN

*Objetivos.* Identificar las contradicciones e incoherencias metodológicas entre los diferentes enfoques de medición de la economía digital en su conjunto, la transformación digital de las empresas; evaluar la eficacia de las transformaciones digitales, y esbozar los contornos del paradigma moderno de la gestión de la transformación digital en el mundo post-Covid. *Resultados.* Se han revelado los cambios en los enfoques conceptuales de la medición de la economía digital y la transformación digital debido a las nuevas tendencias en el desarrollo de la transformación digital. Se ha mostrado qué factores y acciones determinan los resultados de la transformación digital de las empresas, en base a los cuales se ha formado el paradigma moderno de la gestión de la transformación digital. Se han analizado las características de la estrategia nacional de transformación digital. *Conclusiones.* En la nueva realidad post-Covid, las empresas cambiarán drásticamente, y para lograr el éxito necesitarán un nuevo paradigma de gestión de la transformación digital, que combine orgánicamente los aspectos económicos y sociales, un enfoque estratégico y operativo, considerando la gestión de la transformación como un ecosistema flexible de autoaprendizaje.

**Palabras claves:** Economía digital; Transformación digital; Tendencias; Factores; Resultados.

## 1. INTRODUCTION

The rapid expansion of the use of new digital technologies of the Fourth Industrial Revolution forms a rapidly growing segment of the economy, which we call the digital economy. Researchers at the University of Cambridge note that the share of the digital economy in developed countries has grown substantially over the past 10 years: from less than 3% to almost a third of GDP (Coburn *et al.*, 2019). The development of this segment is considered a digital transformation of the economy and society as a whole.

Various approaches to understanding and measuring the digital economy have been developed over the past two decades, among which the following have become the most famous: a set of indicators "Partnership for measuring information and communication technologies" (50 indicators for international measurements); "G20 Toolkit for measuring the digital Economy" (36 key indicators in several areas); "Digital Economy and Society Index" of the European Commission (DESI), which includes indicators of the effectiveness of digital technologies, which are then summarized by the index of digital competitiveness of EU member states; The International Telecommunication Union (ITU), a specialized unit of the UN in the field of information and communication technologies, assesses the state of digital development in 196 member countries of the union; "OECD Toolkit for the transition to Digital Technologies" allows comparing countries by 33 main indicators and a number of additional indicators; the United Nations Conference on Trade and Development (UNCTAD) supports the portal "indicators of the information economy", dedicated to measuring e-commerce and the digital economy; The World Bank uses the "Country Assessment of the Digital Economy" (DECA) to determine the readiness of countries to implement digital technologies; the IMF in the "Measurement of the digital economy" goes beyond GDP and assesses the impact of digital technologies on the well-being of society.

Analyzing all these approaches and ways of measuring the digital economy created at different times, we can see that their diversity is due to the development of digital technologies themselves, awareness of new opportunities and risks of an increasingly complex and constantly changing digital environment, the uncertainty of the digital future and the need to use new technologies to solve societal problems of society. We see a pattern in the development of approaches to measuring and evaluating the digital economy: from narrow definitions focused on measuring the limited impact of specific digital technologies on certain segments of the economy and population, there is a transition to broader, systematic ideas about the impact of digital technologies on the economy and society, as these technologies increasingly interact with each other and have an increasingly profound and diverse impact on economic growth and people's well-being.

The problem is that the huge variety of approaches to digital transformation, offering different standards and measurement practices that are poorly coordinated with each other, does not allow for comparative assessments of the volume, level, structure, and efficiency of the digital economy; as a result, existing measurement tools do not keep up with the rapid pace of digital transformation, which reduces the effectiveness of digital transformation strategies.

There was a need to create an "ecosystem of digital dimensions" that would cover all levels of economic management (national, sectoral and regional, corporate) and would contribute to the realization of the opportunities of the digital economy.

What do we mean by the digital economy today? What is the current systemic view of digital transformation? How should digital transformations and their impact be measured and monitored, taking into account the experience of the pandemic crisis? How successful are enterprises in carrying out digital

transformation? What factors determine the success or failure of digital transformation? How should national digital transformation strategies be formed?

In this work, we are trying to find answers to these questions based on a review of the results of recent theoretical and empirical studies carried out by well-known foreign (Massachusetts Institute of Technology, Boston Consulting Group, Deloitte, OECD, World Bank, World Forum in Davos) and Russian (Analytical Center under the Government of the Russian Federation, Skolkovo Innovation Center, Higher School of Economics, Moscow State University, St. Petersburg Polytechnic University of Peter the Great) research centers in different countries over the past five years.

## 2. MATERIALS AND METHODS

Theoretical and methodological framework: definitions of the digital economy and digital transformation.

To balance the existing contradictory approaches to measuring the digital economy, the OECD proposes to define the digital economy as a multi-level one, namely: the digital economy includes all economic activities that depend on digital resources or are significantly improved through their use, including digital technologies, digital infrastructure, digital services and data (Table 1) (OECD, 2020a). Currently, this definition seems to be the most comprehensive, flexible (the boundaries of the digital economy depend on the specifics of national economic policy and measurement needs), which allows introducing new indicators as the digital environment develops and making them available for measurement.

Table 1. Multilevel definition of the digital economy.

Digital Society			
Wide measurement			
Narrow dimension			
Basic measurement	The economic activity of producers based on digital input resources	The economic activity of producers, which has significantly increased due to digital input resources	Other activities that use or have significantly increased due to the use of digital input resources
The economic activity of producers of digital content, goods, and services of information and communication technologies			

Source: (OECD, 2020a).

There are three levels of the digital economy.

1. *The main dimension of the digital economy.* It includes the economic activity of producers of ICT goods, ICT itself, and information services.
2. *A narrow dimension of the digital economy.* It includes the main sector plus the economic activity of enterprises, which is based on digital input resources. The determining factor is whether the production of goods or services depends on digital inputs, while the ICTs themselves are not created here.
3. *A broad dimension of the digital economy.* It includes the first two levels plus the economic activity of enterprises, which is significantly enhanced by the use of digital resources.  
The first three levels (basic, narrow, and broad dimensions) together represent the digital economy.

4. *Digital society.* It extends beyond the digital economy and includes digital interactions and activities that are not included in GDP. This often includes the use of publicly available digital platforms, because there is no fixed boundary between digital and non-digital activities. Although this activity is not

considered part of the digital economy as such, it is important for the development of an effective national digital strategy.

5. *Additional economic activities that are ordered and/or provided in digital form.* This measurement is focused on the method of ordering or delivery, regardless of the final product or the method of its production.

Definition of the digital transformation of enterprises.

Many definitions of digital transformation emphasize the leading role of the latest technologies: it is the process of using digital technologies to create new (or change existing) business processes, culture, and customer experience to meet the changing requirements of the business and the market; it is the strategic introduction of digital technologies to improve processes and productivity, manage business risks and improve customer service (Kane, 2019).

Many experts agree that the need for the digital transformation of enterprises and industries arises as a result of the emergence of new digital technologies with a high breakthrough (radically changing enterprises, industries, and markets) potential. Therefore, to respond to digital shocks, the introduction and use of new technologies are primarily required. Digital transformation is the process of scaling digital innovations, from the emergence of an idea (is there a fundamental need for an idea in the market?), through incubation (are we able to "grow" a viable product worthy of scaling?) and before investing in the widespread dissemination of new products and technologies (Kane, 2018). This approach has dominated the era of new technologies entering the market when they seemed to open up a bright future for many, many companies.

Research shows that CEOs and technical managers agree on the importance of digital technologies for managing key business strategies and performance indicators; many CEOs consider IT directors and technology leaders to be their main business strategy partners (Kark *et al.*, 2021).

Some time passes, experience accumulates, and an increasing number of researchers, whose opinion we join, believe that digital technologies are not necessarily a solution to emerging problems; effective actions related to a digital breakthrough are associated not only with technologies (Kane, 2019); it is assumed that digital transformation is not so much a technological as a managerial problem (technologies develop quickly, organizations change much slower). We need a broader, system approach.

***System approach.*** From the standpoint of a systematic approach, the keyword is the transformation in the phrase digital transformation; this type of transformation in change management theory is described as radical, nonlinear, quantum, large-scale changes in complex adaptive systems. Not all large-scale, critical, and complex projects can be considered as a transformation – only those initiatives that change the way we do business and work.

The value of digital technologies is that they create opportunities to conduct business differently. Managers transform business with the help of technologies, i.e. they focus not so much on what technologies are capable of, but on how the business should look as a result of transformations, what it should transform into. A fundamental role in the development of organizational capabilities is played by leadership, which is designed to choose the right technologies for the right jobs, launching wave after wave of innovation. Technological transformation becomes the cornerstone of the future strategy – the strategy of corporate transformation (Kark *et al.*, 2021; Westerman, 2017). This approach, as recent studies show, brings high economic results.

It has been recognized that technologies are certainly important, but the human factor is no less important: organization, operating model, processes, and culture. Experience suggests that organizational inertia due to deep-rooted behavior is the strongest obstacle for carrying out transformations.

The introduction of new digital technologies alone does not ensure adaptation to the new digital environment, as evidenced by the high percentage of failures in the implementation of digital projects; systemic changes in talent, leadership, culture, structure, and strategy are necessary to thrive in this rapidly changing environment; these systemic changes create new (third) generation learning companies.

Companies will invest in new technologies, but the more important question for success is how companies will move forward through this new world. The ways of moving towards the desired future are diverse, their effectiveness cannot be predicted in advance, therefore, participants in discussions about strategies and problems of digital transformation do not seek to develop a single common definition of digital transformation of enterprises; some of them consider this impossible and impractical.

The development of Industry 4.0 brings new waves of interconnected digital technologies to the market, turning the process of digital transformation of enterprises from discrete to continuous (it is known that transformation in an organization is like muscles that need to be beef up). Successful companies will innovate faster and faster, moving away from laggards; the OECD roadmap for measuring digital transformation offers a specific sequence of action to increase the probability of success (OECD, 2019).

### 3. RESULTS

Trends in the development of digital transformation of enterprises.

*The COVID-19 pandemic has caused an acceleration of digital transformation.* The pandemic has caused new problems and unexpected risks – high instability and uncertainty, putting the stability of enterprises (industries and regions) to the most severe test, significantly increased the dependence of business on digital technologies, and accelerated the timing of the introduction of digital technologies, providing technology leaders with an unprecedented opportunity to shape the future of their companies. High speed of change is a new paradigm of digital transformation. The bandwidth at Internet traffic exchange points from December 2019 to March 2020 doubled in the EU countries, and substantially – in China.

According to the BCG study<sup>1</sup>, 83% of business leaders expect further acceleration of digital transformation; 65% of respondents expect increased investment in digital transformation. The share of enterprises' proprietary funds in financing digital transformations has increased over the past three years from 50% in 2017 to 80% in 2020; it is higher in young companies (85%), lower in the public sector (65%). Therewith, 90% of respondents expect a more thorough audit or a stricter funding policy (Chakraborty *et al.*, 2020).

The pandemic has not only become a major catalyst for transformation but has also created or opened up opportunities that can improve digital transformation programs in the future.

*The constant strengthening of the interdependence of enterprises in the process of their digital transformation.* It is estimated that the number of devices connected to the Internet of Things will grow from 15.4 to 75.4 billion from 2015 to 2025 worldwide (Statista, 2021). There is an exponential growth of

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<sup>1</sup>The BCG study includes internal and external data sources. The internal data is taken from BCG's own experience working with 70 leading companies around the world on their digital transformation over the past few years. External data includes the responses of 825 senior managers in a detailed survey about their transformation experience.

data flows: it is expected that the traffic of the global Internet protocol will double in 2021 compared to 2018, the global Internet connection speed increased 4.5 times from 2011 to 2018. Differences in Internet access and use between countries and social groups are increasing. The increasing complexity of the digital economy increases its vulnerability (OECD, 2020b).

*The digital threat landscape is rapidly changing, which is becoming more diverse and technically complex, causing increased exposure to digital attacks, more private and serious violations of digital security. Digital transformation, on the one hand, increases the efficiency and security of business, on the other – creates new risks, changing their structure and intensity. National digital security strategies are being deployed in all countries, the effectiveness of which is evaluated, in particular, using the "Global Cyber Security Index". Russia belongs to the countries with a high level of the cybersecurity index (0.836 in 2019) (ITU, 2021).*

*Businesses are increasingly aware of the potential of digital technologies. Fifty-five% of companies in the consumer sector, 43% of public companies, 18% of companies in the public sector consider new digital technologies destructive, i.e. capable of changing existing business models and creating new ones. Other companies believe that digital technologies support today's business models – these companies either do not realize the potential of digital technologies or are so advanced that new digital technologies are already the basis of the business models used (Chakraborty et al., 2020).*

*Digital transformation is increasingly focused on generating revenue and getting closer to customers. As evidenced by the answers of business leaders to the question about the goals of digital transformation (Figure 1). By focusing on customers, companies ensure growth, because customers are the key driver of future growth.*

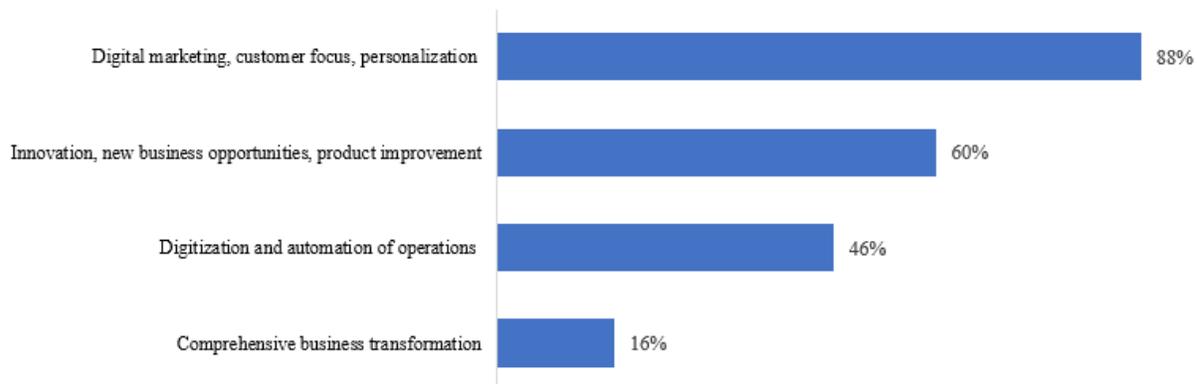


Figure 1. Business goals of digital transformation of enterprises.  
Source: (Chakraborty et al., 2020).

More broadly, people are more important than ever before. The pandemic focused on such areas of company development as expanding remote work and improving cybersecurity.

*Centralization in the management of digital transformation in enterprises is increasing. As evidenced by the following data:*

- 75% of the transformations are on the agenda of the management of the CEO/executive director, 50% of the transformations are directly controlled by the CEO;
- Sixty-five % of companies conducting digital transformation had a special director for digital technologies in 2020, only 10% – in 2016;

- senior management reviews reports on digital transformation quarterly and more often in 71% of companies (Chakraborty *et al.*, 2020).

*Wider and wider digital platforms are developing.* More and more managers are showing interest in implementing digital platform strategies. Platforms help to make resources and participants more accessible to each other as needed, insure against digital failures, and use network effects to create new value (Jacobides *et al.*, 2019; Lang *et al.* 2019). According to forecasts, the platforms will bring about 10 US Dollars Trillion in global value over the next decade (Sharma *et al.*, 2020).

Launching a digital platform requires the transformation of the entire enterprise: its strategy, business model, capabilities( potential), processes, technologies, and people. Such a radical transformation is associated with high risks: less than 15% of the studied ecosystems were stable in the long term (Reeves *et al.*, 2019). Successful ecosystems update their platforms more often and faster with the help of new technologies than others: the entire top ten leading companies with the highest innovative potential use digital platforms.

Results and factors of digital transformation of enterprises.

Successful enterprises in the coming decade will be significantly different in comparison with today's ones (Bailey *et al.*, 2019). A recent study by the Boston Consulting Group (BCG) shows that 70% of digital transformations do not achieve their goals, often with serious negative economic consequences for enterprises; however, it is quite possible to increase the chances of success from 30% to 80% (Forth *et al.*, 2020). It is very difficult to implement fundamental changes in large organizations (admittedly, this is "aerobatics" in the work of company managers), especially in conditions of short-term stress. Leaders shall decide whether they will risk their career by carrying out radical transformations, or will prefer a quieter life leading to the lag of their enterprises from more active competitors, thereby determining both their future career and the trajectory of their company's development.

## 4. DISCUSSION

Winners and losers

According to the BCG study, more than 80% of managers plan to accelerate the digital transformation of their companies, striving to make it successful, and there are good reasons for this. For successful companies – leaders of digital transformation, profits are growing 1.8 times faster, and the company's value is twice as fast as for laggards. Enterprises lagging in digital transformation are less successful in attracting customers, process efficiency, and innovation (Forth *et al.*, 2020).

In the short term, digital technologies increase productivity and improve the quality of customer service. In the medium term, digital technologies open up new opportunities for the growth of companies and innovations in business models. Successful digital transformations in the long term (the next decade) will represent the continuous development of innovations, which will allow companies to achieve sustainable development, as a result of which their appearance and functions will change. *Achieving the rhythm of continuous (sustainable) improvement, or turning companies into third-generation learning organizations will make the "digital transformation" concept obsolete.*

To determine how successful companies are in carrying out digital transformation, managers were asked questions in the BCG study about how well the transformation goals were achieved, how timely, what are the results in comparison with other transformations, and how sustainable these changes are (answers were given on a 10-point scale). A multicomponent and precisely verified assessment of the productivity of digital transformation is an undoubted advantage of this study.

According to the level of success of the transformations, the companies were divided into three groups (Forth *et al.*, 2020):

1. "*Winning companies*" (received from 8 to 10 points) – companies that have successfully implemented innovations: they reached or exceeded the established target values and led to sustainable changes (30% of companies).
2. "*Companies in the zone of concern*" (received from 6 to 8 points) – they created some new value, but did not achieve their goals and led to limited long-term changes (44%).
3. "*Companies in the disaster zone*" (received up to 6 points) – these companies unsuccessfully carried out digital transformations: they created limited value (less than 50% of the target), without providing sustainable changes (26%).

Successful companies created an average of 66% more value, increased corporate capabilities by 82%, and completed 120% more goals on time compared to companies in the disaster zone. Compared to the companies in the area of concern, the winners created 29% more value, improved opportunities by 20%, and completed 32% more plans on time.

#### Factors of digital transformation

Numerous previous studies have provided an ever-expanding list of factors determining the success or failure of digital transformation, the total number of which has exceeded a hundred. These studies differed in the degree of methodological maturity and the reliability of the results obtained. The companies studied worked in different industries, started transformations from different initial levels and with different goals. There were doubts: are there any common factors that determine the success of their digital transformation?

The BCG study, which we rely on, showed that the management teams of various companies, starting the transformation, were looking for answers to very similar questions (Forth *et al.*, 2020):

- *Why are we doing this?* Is it necessary to respond more actively to the rapidly changing needs of customers? Should productivity be increased gradually? Does our company's ability to innovate lag behind others or not?
- *What should we do?* The scale and directions of digital transformation vary widely in different companies: from focusing on people to major technology and infrastructure upgrades, replacing outdated IT platforms, and moving to the cloud. Many companies focus on specific business results: personalization and digital marketing, end-to-end customer interaction, digital supply chains, and shared digital services.
- *How to implement the transformation?* There are many questions about leadership, management, resource provision, focus, approach (for example, the use of pilot projects, incubators, or beacons), and the sequence of actions. How to make sure that products, channels, and support functions work in unison with the technological function, and how to attract middle-level management to work?

BCG researchers have identified six critical success drivers that can increase the chances of success from 30% to 80%. They tested more than 35 factors that reflected the leadership's commitment to transformation, strategy and approach, management, financial and human resources, technological capabilities; and mathematically strictly showed that of all possible combinations, none had the same

impact on success as these six factors. Each of the six factors must be fully taken into account when planning, preparing, and executing digital transformation; if companies adequately take into account only three or four factors, they fail in transformation. These are the factors (Forth *et al.*, 2020).

1. *An integrated strategy with clear transformation goals.* Only 40% of enterprises form a truly integrated strategy: they create a clear vision supported by a set of strategic imperatives and quantified business results, link digital technologies with a common business strategy, and a sustainable competitive advantage.

2. *Management commitment: from the CEO to middle managers* (solving the problem of the "frozen middle"). Commitment is formed through involvement in the planning and implementation of the digital transformation program. Companies need to be aware of the threats to the career and well-being of employees that can create transformations, and take measures to neutralize them.

3. *The use of first-class talents.* Enterprises often do not have the skills necessary for digital transformation and underestimate the importance of such skills. The required roles and skills are carefully evaluated, strong specialists are encouraged and retained.

4. *Flexible thinking and behavior.* The willingness of leaders to adapt management and adjust priorities depending on the changing context. It is impractical to postpone digital transformation until each factor is fully formed; it is critical to know about the defects of each factor and develop a plan to eliminate them. More than two out of three successful digital transformations had effective flexible leadership, while 9 out of 10 unsuccessful transformations did not have this factor.

5. *Effective monitoring of progress in achieving the desired transformation results.* Effective monitoring was noted in 90% of successful transformations and 40% of the total number of companies.

6. *Modular technologies and a data platform for business.* More than half of the companies that participated in the study faced a lack of flexibility in their technology platforms.

These six factors, according to the authors of the study, work for all digital transformations, regardless of their breadth. There are statistically insignificant differences in the success of transformations with one and several digital initiatives; affecting one business unit or the entire company. No correlation was found between the number of resources allocated for the transformation and its results: 60% of the companies in the "worry" and "grief" categories spent the same or a proportionate level of resources as the "winners", but with significantly less benefit. This means that companies should take the time to create a common configuration for success, and then move on to large-scale and bold actions.

#### Features of the state digital information strategy

Many countries have a digital transformation strategy, but most of these strategies are relatively narrow in terms of the range of problems under consideration and the tools for solving them. An effective strategy should be comprehensive in covering interrelated policy issues, ensure policy coherence in the areas and sectors that shape the digital transformation, involving all stakeholders in its development and implementation (OECD, 2020b).

Approaches to managing the interaction of stakeholders differ significantly in various countries. The definition of responsibility for the strategic coordination of digital transformation is common to all approaches, as a rule, either at the level above the ministerial or at the level of the leading ministry. In the Russian Federation, one of the Deputy Prime Ministers of the Russian Federation oversees the national

strategy, and the Minister of Digital Development, Communications, and Mass Communications of the Russian Federation heads the project.

The national digital transformation strategy is based on the strategic vision of digital transformation, which defines the contribution of digital transformation to the achievement of common national goals, such as inclusive growth, increased well-being, and sustainable development. The vision allows forming strategic priorities for digital transformation and ensuring that this program is consistent with national programs in other key areas.

In the process of implementing the strategy, the costs and results of work are measured, monitored, and evaluated to measure progress; understand the driving forces and obstacles to digital transformation; evaluate the effectiveness of transformation.

In Russia, the strategy of digital transformation for the medium term has been called the National Project "Digital Economy of the Russian Federation" for 2018-2024 (Passport of the national program "Digital Economy of the Russian Federation", 2018). This project is being implemented within the framework of the "Strategy for the Development of the Information Society in the Russian Federation for 2017-2030" (President of the Russian Federation, 2017).

The project "Digital Economy of the Russian Federation" assumes a threefold increase in the share of expenditures on the development of the digital economy in GDP compared to 2017 (from 1.7% to 5.1%). The total budget of the national project is 1634.9 billion rubles; 67% of this amount will be received from the federal budget and 33% from extra-budgetary sources. The distribution of the budget of the national project between the federal projects included in the national project is shown in Figure 2.

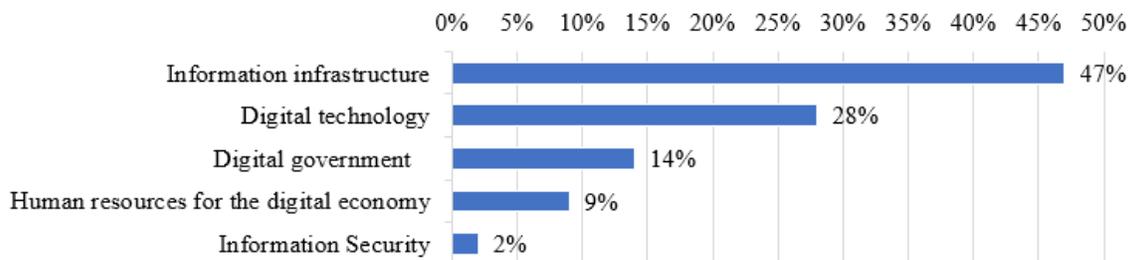


Figure 2. Distribution of the budget of the national project "Digital Economy of the Russian Federation" between federal projects included in the national project, in %.

Source: Passport of the national project "Digital Economy of the Russian Federation" (2018).

According to the national project, all socially significant infrastructure facilities (100%) and almost all Russian households (97%) will be connected to broadband Internet access by 2024. Russia's share in the global volume of data storage and processing services will reach 5% in 2024, and the average downtime of state information systems as a result of computer attacks will decrease to 1 hour. The share of domestic software purchased or leased by state authorities will increase to 90%, and purchased by state-owned companies and companies with state participation – up to 70% (Passport of the national program, 2018).

To implement the national digital transformation strategy, specific measures and tools have been developed, including broad communication support, investments, incentives and taxation, public services and programs, legislation and regulation, the distribution of responsibility between participants and sources of funding has been clearly defined, the necessary skills and capabilities of key actors and organizations responsible for the strategy have been formed.

## 5. CONCLUSION

According to experts, the pandemic crisis (an unexpected and deep shock) in countries with developed healthcare will be overcome in 2022. Today, the attention of leading research centers is focused on finding an answer to the question of what digital transformation will be in the post-Covid world (Analytical Center under the Government of the Russian Federation, 2020; Chakraborty *et al.*, 2020; Lesser and Reeves, 2021).

The COVID-19 crisis has reinforced the need for continuous learning, adaptation, and digital transformation: if companies allow for a significant decline in performance, it may be too late to recover; simply digitizing existing processes will not bring long-term benefits. Companies that were better adapted to move in a more dynamic post-Covid environment will benefit. Organizational changes will be crucial, digital technologies will be used in the development and implementation of change programs, transformation management is turning into a flexible self-learning ecosystem.

Companies with a higher speed of digital learning and the ability to increase their resistance to unexpected shocks win. The effectiveness of the transformation is checked by how ready the company will be for the next shock.

The crisis has increased the importance of constantly searching for the optimal combination of people and machines. It made obvious the huge potential of artificial intelligence and the need for companies to turn into hybrid learning organizations that organically combine technological and human capabilities (training at the speed of data, reorientation of people to problems of a higher cognitive level, new interfaces for people, digital platforms) (Lesser and Reeves, 2021; Trofimov *et al.*, 2020).

There is a growing need for greater diversity in companies. Organizations with more diverse experiences and views are more innovative, sustainable, and able to build their potential for continuous digital transformation faster than others. George Westerman put it succinctly and expressively: people are more important than ever; wake them up; turn them on; help them do the impossible.

As it seems to us, it is the most important thing. The COVID-19 pandemic crisis has exposed and exacerbated the need for more active participation of enterprises in solving societal (vital for the development of countries) long-term problems, such as human health, employment, inequality, well-being, climate change. To solve these problems, more effective tools will be created to anticipate and neutralize the growing social, economic, and environmental risks that can destroy the economic system.

Governments, businesses, and all other stakeholders should work together to shape a digital future in which the opportunities of digital transformation for improving people's lives will be most fully realized. In the upcoming studies, it is necessary to justify the incentive matching methods for coordinating the behavior of stakeholders in the constantly changing digital landscape.

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