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### Adaptive infrastructure and technological opportunities for the development of the digital enterprise economy

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**Abstract.** The development of digital enterprises takes place in constantly changing conditions, requiring the use of adequate infrastructure and technological capabilities to adapt to change, withstanding competition in domestic and foreign markets. The priority areas in the implementation of infrastructure and technological opportunities for the development of digital enterprises are updated strategic management technologies, non-standard mechanisms for increasing economic activity of the population, better digital financial instruments, as well as effective cybersecurity and economic adaptation systems required in the new economic conditions.

**Key words:** strategic management, digitalization of finance, economically active population, cybersecurity.

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### Адаптивная инфраструктура и технологические возможности для развития экономики цифрового предприятия

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**Аннотация.** Развитие цифровых предприятий происходит в постоянно меняющихся условиях, требующих использования соответствующей инфраструктуры и технологических возможностей для адаптации к изменениям, выдерживая конкуренцию на внутреннем и внешнем рынках. Приоритетными направлениями в реализации инфраструктуры и технологических возможностей для развития цифровых предприятий являются обновленные технологии стратегического управления, нестандартные механизмы повышения экономической активности населения, более совершенные цифровые финансовые инструменты, а также необходимые эффективные системы кибербезопасности и экономической адаптации в новых экономических условиях..

**Ключевые слова:** стратегическое управление, цифровизация финансов, экономически активное население, кибербезопасность

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## Introduction

Economic and managerial changes in the national management system cannot do without modern technologies, tools and mechanisms for their use in real and virtual reality. Together with information, structured knowledge, a system of skills and skills, they are modern drivers for the development of digital enterprises. Unfortunately, not all digital enterprises are achieving high success and the reasons for this are very specific and different. Some enterprises do not have a proper development strategy, others have problems with digitalization of finance, third have a system of cybersecurity and adaptability of technology to current changes. All together experience inconvenience due to insufficient economic activity of the population. Given the importance of the development of digital enterprises and large companies based on them, solving these problems is an urgent task of important national economic importance.

## Materials and methods

The article used scientific publications on this problem, which made it possible to summarize the accumulated experience and identify the features of the modern state of use of adaptive infrastructure and technological opportunities for the development of the economy of digital enterprises. Statistical processing of information from available sources was used. The scientific basis of the study was compiled by various methods of cognition, which allow comparing the objects of study in time, space,

in close relationship with each other and with other phenomena.

## Results

The study showed the presence of such priority areas in the implementation of infrastructure and technological opportunities for the development of digital enterprises, such as updating strategic management technologies, using non-standard mechanisms to increase economic activity of the population, using advanced digital financial instruments, as well as effective cybersecurity systems and adapting the economy required in the new economic conditions. New possibilities of finance are shown when using them on the Internet, through successfully integrated information and computer technologies, in the field of communications. Attractive funding opportunities for projects such as crowdfunding, crowdsourcing and fundraising have become available. The basic technologies of digital enterprises in the field of finance are highlighted: blockchain, cryptocurrencies, big data, distributed databases, new platform companies associated with the generation, processing, storage, and transfer of data. An increase in the indicator of economic activity of the population of Rossi was revealed, necessitating an adequate increase in digital literacy and digital culture of citizens. An effective tool for staff adaptation, such as a corporate social network, is proposed for wide implementation, which allows employees to significantly reduce the time to adapt to new living conditions for digital companies. It is recommended to develop a security rule for digital enterprises operating remotely and show the need to train personnel to comply with them, taking into

account the accumulated corporate practice of protecting information in various situations.

### Discussion

Effective strategic management by development of the digital enterprises is a necessary condition of successful functioning of economy. It is necessary to understand the organization using different information technologies allowing to create competitive advantage in the market of commodity and services in the activity as the digital enterprise, within the created strategy and providing more than 75% arrived due to digitalization. Strategy is understood as the combination of methods of the competition and business organization directed to satisfaction of individual customer needs and achievement of the goals of the company with the most rational way.

The management of the digital enterprise has to develop such strategy of management which will conform more to requirements of modern business. A variety of strategy and their combination allow to transform actions in compliance with changes of internal or external factors which influence activity of the company [Grimashevich 2018].

The most rational sequence of actions of strategic management in the form of the corresponding stages includes forming of strategic vision of the future of the company; statement of the planned development purposes; development of strategy at various levels, a pyramid of development of strategy; strategy implementation; assessment of results and correction of strategic vision. It should be noted that strategic management by the digital enterprise represents cascade model [Kosheleva 2019]. At the same time, at each stage the transition as on the following level of management can be performed, and return to the previous level, for example, for specification of any information is made. Besides, digital technologies constantly

are improved, appear new players in the market while others disappear that demands correction of the current strategy of enterprise management and adoption of the relevant decisions. During development of strategy of management of the digital enterprise it is necessary to give paramount attention to questions of relevance of the applied technologies of digitalization.

However, before making changes to the current strategy of management, it is necessary to find out the following questions: what sphere of production

it will be directed new technologies to; what tools will be required for their introduction; that for changes it will be required to bring in the current activity of the enterprise; what possible risks from implementation of new technologies consist in and that can be received for effect as a result of expected changes. At the same time many companies develop a strategy of the enterprises not always proceeding from business challenges for the sake of which solution it is developed [Baranovsky 2018].

Now most the enterprises are not ready to carry out digital transformation. Their management does not realize real need of digitalization and quite often works without the necessary strategy. All this demands understanding of an essence and features of strategic management by development of the digital enterprises, ability to formulate the accurate goals and objectives facing its collective.

Before being engaged in strategy, the management of the digital enterprise needs to carry out work with employees and to manage to explain importance of the carried-out changes for the future of the company. The implementation of the strategy will depend on how much it can create the conditions required to adapt employees to update business processes. Other actions of the management will also be required. Now special attention is not accidentally paid, for example, to management of finance, demand for which remains at the high level, as a result of the mass digitalization of economic entities demanding development of adequate financial instruments and relations.

From that, finance is how effective, the competitiveness of the digital enterprises in many respects depends. It should be noted that the modern terms of business are dictated need of transition of the enterprises to use of digital technologies for the financial sphere. This phenomenon from the category of desirable, turns into the status of obligatory digitalization of financial processes, their organization and control, creation of digital financial products. Digital products promote increase in efficiency and competitiveness of management of finance, make them available in real time, allow the enterprises to feel steadily in the market.

Now understanding that the digital economy is not only development and introduction of innovations and innovations which by right have to possess the priority place in modern society, but also purposeful work of financial institutions is

actively formed. Essentially new opportunities of finance reveal at their use on the Internet, through successfully integrated information and computer technologies, in the sphere of communications<sup>1</sup>. Modern sites on the Internet allow to improve conditions not only for business, but also for search of necessary financial resources, investments. On the basis of rapid development of information and communication technologies, new attractive funding opportunities, for example due to use of crowd funding, crowdsourcing and fundraising became available to the modern enterprises [Ukolov 2017].

Digital technologies increase effectiveness of financial management. They penetrate financial strategy, strengthening its technological capabilities regarding work with big data, with information in real time, with investment projects, business by processes, logistics, and other components in which finance participates, causes emergence of new digital products. Basic technologies of the

1 Tsifrovaya ekonomika Rossiyskoy Federatsii [Digital Economy of the Russian Federation] : National Program: Order of the Government of the Russian Federation No. 1632-r dated July 28, 2017. *Government of Russia* : [website]. URL: <http://government.ru/docs/28653/>. Date of publication 07/31/2017 (in Rus.).

digital enterprises in the sphere of finance can be considered: a blockchain, cryptocurrencies, big data, the distributed databases, the new enterprise platforms which are connected with generation, processing, storage and data transmission. By means of digital solutions it is possible to automate accounting, to improve analytics and to build uniform financial processes in the companies and branches.

Introduction of new digital products is directed to creation of the most favorable conditions for permanent monitoring of existence of financial resources and also option of their most effective placement and use for the purpose of satisfaction of economic interests of the enterprise and search of competitive advantages [Stepanets 2018].

In the conditions of digital transformations of spheres of economic activity, the discrepancy of traditional, most widespread models of finance of the enterprise, with new models is traced. It is caused by existence of contradictions between the existing management systems and construction new, with other digital financial infrastructure accelerating capital flow. However, despite existing disagreements, in modern conditions the financial strategy of the enterprise has to be directed to achievement of the following key purposes (fig. 1).

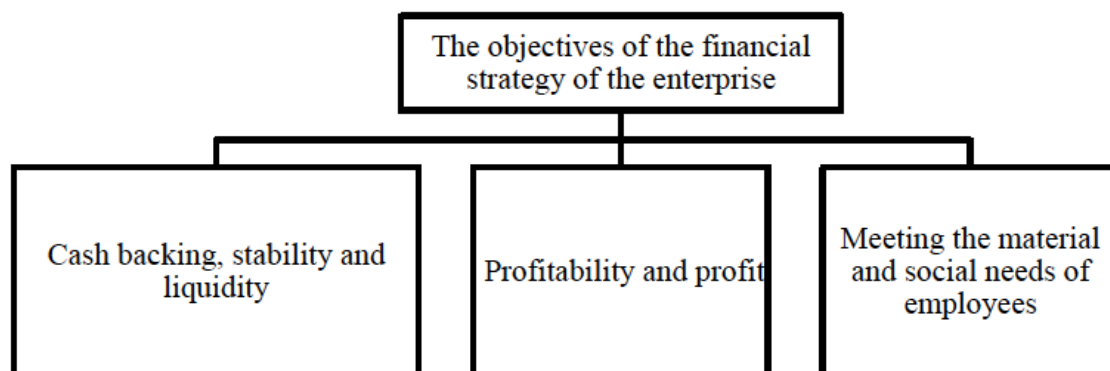


Figure 1. Key objectives of the company's financial strategy

At the same time, in new conditions management of finance of the enterprise has the difficulties. We will analyze some of them [Trofimova 2020]. So, use of digital technologies in strategic management by finance leads to the increased risks connected with information and demands development of an information security system. Its insufficiently effective work can lead to financial losses of the company and even to its bankruptcy. Use of digital strategic solutions in the sphere of finance not always does without technological mistakes. From

emergence as a result of failures in work of a financial system from which it is not always possible to be protected. And failures can be at any time and in the most unexpected situations [Shirinkina 2019].

Management of finance of the enterprise is subject existence of a considerable part of other risks which are inherent in all system of digitalization and work in virtual space. They can be neutralized in certain limits over time.

The majority of transformations of economic entities are connected with the digitalization

demanding a certain level of activity of the working population. We will use the analysis of its state for 2017–2019 to understand the developing trends of change and to use them when planning and forecasting the forthcoming changes. So, if in 2017 the number of the working population in Russia made 95.8% (72,316 thousand people from all labor), then in 2018, it increased a little (by only 0.3%, or to 72,532 thousand people)<sup>2</sup>. However, in 2019 the number of the working population was already reduced by 0.8% (or by 599 thousand people) and the number of busy decreased up to 71,933 thousand people. If we continue the analysis and we investigate this indicator in 2020, then we will see that the active population in Russia in November of this year increased and reached up to 75.3 million persons<sup>3</sup>.

Thus, the indicator of economic activity of the population of Rossi tends growth, allows to count on participation of citizens in the happening transformations. It will also demand creation of necessary conditions for achievement of appropriate levels of digital literacy, a digital maturity and acquisition of the required skills. Personnel of the modern enterprises, also has to correspond to the competences necessary for professional activity in the conditions of digital economy. They also need mastering of new technologies and instruments of digital management. All this will allow to create future economy on balance of the human resources supported with digital technologies and instruments of management of new generation.

Other important question of success of digital transformations is the adaptability of the working population and personnel of the companies, to the happening changes. It is clear, that everyone has to be able to adapt, without loss of value reference points. But there is a question, what perspective decisions for problems of adaptation, especially, how to create the convenient instrument of communication between the worker and the company management that adaptation, including its social aspect, took

2 Ekonomicheski aktivnoye i trudosposobnoye naseleniye [Economically active and able-bodied population]. *Rosinfostat* : [website]. URL: <https://rosinfostat.ru/ekonomicheski-aktivnoe-naselenie/> (accessed 12/23/2020) (in Rus.).

3 Dinamika chislennosti ekonomicheski aktivnogo naseleniya [Dynamics of the economically active population]. *Goskomstat RF*: [website]. URL: [http://www.gks.ru/bgd/free/b00\\_24/IssWWW.exe/Stg/d000/i000040r.htm](http://www.gks.ru/bgd/free/b00_24/IssWWW.exe/Stg/d000/i000040r.htm) (accessed 12/23/2020) (in Rus.).

place successfully.

Practice shows that such tool is the corporate social network which large companies [Belonogova 2017] are able to afford to create. By means of it the staff of the company can communicate in chats as with each other, and with the management. In particular, it can look approximately so: the news feed places information on the happening and planned changes in the company, and an opportunity to unite in interest groups allow to share experience, to start new communications and to build up the required relationship; the social network can provide access to the materials and documents which are required the solution for development to online a format.

In order that adaptive workers could find quickly specialists necessary to them, understand the organizational structure of the company and accelerate process of the adaptation, the simple system of search of colleagues, an opportunity to create virtual the plan scheme, all departments can be added to social network. One more useful function – the calendar in which all significant events are included: meetings, presentations, planning meetings, corporate events and many other things.

The thorough and well thought over orientation of social network under needs of clients of the company and also addition function of geolocation which can be very attractive can become a pleasant bonus.

At development of technologies of digitalization of economic entities, questions of information security support are put<sup>4</sup> in the forefront. Permanent updating of cyberthreats at the enterprises in general and ordinary workers demands adequate skills of counteraction and adaptation to the happening changes, without any losses. Due to the distribution of a remote operating mode, the employees using the personal space for Internet-communication have to observe safety requirements at the enterprise level that demands expenditure of means in this direction, including creations of the mode of safety of corporate information.

Weak spot in a home information network are routers, using which, it is possible to capture working devices and to pass from one device to another, trying to be fixed in corporate network for

4 Kiberbezopasnost' vstupayet v poru zrelosti [Cybersecurity is entering its maturity]. *PwC* : [website]. URL: <https://www.pwc.ru/ru/publications/digital-trust-insights-2021.html> (accessed 01/12/2021) (in Rus.).

its use in the purposes. Measures of protection are inseparable from the enterprises here. The latest trends in enterprise protection are IT infrastructure upgrades and faster cloud migrations, making it difficult for hackers to locate and process data.

Remote work also represents a problem as immersion in a cloud environment and use of new tools for joint operation, do security by even more difficult task. For ensuring transparency of a system and requirements satisfaction in scaling, the organization collect and store huge volumes of data from various sources and Wednesdays which quite often become available to unauthorized faces.

There is a probability and the fact that weak spots in the application programming interfaces helping to develop services and the software on the corresponding devices and also giving opportunities for customer interaction through various applications will be subject to the attacks of malefactors. Malefactors can use program intermediaries as entry points in the organization and as interfaces become more and more essential in corporate virtual space, the probability of their attack becomes more real. It demands acceptance of the preventive and infrastructure measures of protection protecting from this type of threats. At the same time, for safe remote work of employees at home constantly awaking to be required protection of IT infrastructure of the companies. It will concern all removed labor over time.

The persons making decisions on improvement of a system of information protection have to use the most qualitatively made forecasts and consider them when developing strategy of cyber security. Implementation of strategy constructed on reliable

information will allow to build the proper system of protection against threats which manifestation probability in the foreseeable future is rather high. The notification of users about tactics and possible vectors of the attack of malefactors can serve as other measure of protection. Besides, the companies have to develop safety rules during the work for the remote mode, train personnel in their observance and extend the advanced corporate practitioners of information protection in various situations. Such rules have to reflect security policy of the company and a response to the arising incidents. At the same time the round-the-clock detection of threats, carrying out the complex analysis, regular updating of the used applications and definition of priority measures of protection is important.

### Summary

The peculiarities of the modern state of using adaptive infrastructure and technological opportunities for the development of the economy of digital enterprises make it necessary to use various system-forming approaches. These include the implementation of updated strategic management technologies, non-standard mechanisms for increasing economic activity of the population, more advanced digital financial instruments, as well as effective cybersecurity systems and economic adaptation required in the new economic conditions. They allow digital enterprises to develop and qualitatively solve the problems of satisfying the needs of consumers in a real and virtual operating environment.

### Conflicting interest

The authors confirm that the submissions do not contain a conflict of interest.

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