

# *Methodology for evaluating effectiveness and forecast of the digital economy projects*

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**Abstract —** The article is devoted to the consideration of the stages of development and implementation of a digital economy development strategy in our country, as well as the methodology for evaluating the digital economy projects effectiveness and forecast. The application for evaluating the digital projects effectiveness is considered with the help of indicators traditionally used for this purpose according to the UNIDO methodology.

**Keywords —** digital economy, information technology, economics and mathematical modeling, UNIDO methodology.

## I. INTRODUCTION

Recognized leaders of economy digitalization today are Singapore and the United States, the governments of these countries are actively introducing digital technologies. The British government is also taking steps in this direction. It has developed a strategy for the digital economy development, as well as China, Korea, and Japan, which are using the elements of the digital economy and are trying to solve market leadership issues. While studying the experience of these and other countries, Russia, using its competitive advantages, also solves the issues of digitalization of the economy and education, social issues preparing for the next step of industrial and technological revolution, its digital stage.

The goal of this article is to highlight the stages of development and implementation of a digital economy development strategy in our country, as well as the methodology for evaluating the digital economy projects effectiveness and forecast.

The Government of the Russian Federation of July 28, 2017 approved the Digital Economy of the Russian Federation Program (hereinafter referred to as the Program), which was developed as part of the Information Society Development Strategy in the Russian Federation for 2017-2030, approved by the Decree of the President of the Russian Federation of May 9, 2017. No. 203 "On the Strategy for the Information Society Development in the Russian Federation for 2017-2030" (hereinafter referred to as the Decree) [1].

The importance of this Program on the accelerated implementation of digital technologies in the economy and social sphere is emphasized in Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On National Goals and Strategic Tasks for the Development of the Russian

Federation for the Period until 2024", hereinafter referred to as the Decree No. 204) [2].

## II. MATERIAL AND METHODS

It should be stated that this program establishes 5 basic directions for the digital economy development in the Russian Federation for the period until 2024:

These include:

- normative regulation, which should find its evolution in the development and implementation of measures to improve the legal regulation of the digital economy (namely, the inadequate development of the regulatory framework has led Russia to be in the fourth dozen countries according to digital economy readiness assessment).
- personnel and education; this direction has been developed in improving the education system to meet the growing demands of companies that are starting to operate in the new conditions of the digital economy.
- formation of research competencies and technical stock, this area is characterized by the creation of support systems for search and applied research.
- information infrastructure; it is clear that this is the development of networks, data center systems, the introduction of digital platforms for consumers to work in the form of state power, business and citizens.
- information security, one of the most important areas, because now the challenges associated with protecting the individual, society and the state from internal and external information threats have become active [1].

## III. RESULT AND DISCUSSIONS

Consider the dynamics of monitoring the information community development in the Russian Federation.

One of the key criteria for the information (digital) community formation is user access to the Internet. We see that during the period from 2010 to 2017 the number of collective use points (access) with Internet access decreased, they almost disappeared – but it should be noted that users having the opportunity to use the network individually, went to a new level of formation and security information community. And this is confirmed by the fact that the number of

subscribers of fixed broadband Internet access per 100 people increased from 12.2 to 21 people, and the number of subscribers of mobile broadband Internet access per 100 people increased from 47.8 to 79.9 people. This indicates the universal use of mobile Internet both in personal and in work plan.

The number of Internet users per 100 people increased to 76 people, which indicates the universal use of this resource.

The share of the population that uses the Internet to receive state and municipal services in the total population who received state and municipal services more than doubled in 2013 and amounted to 64.3% in 2017 [3].

As a fact of the readiness of state authorities (SA) and local self-government authorities (LSGA) to use information and communication technologies for the management functions implementation and the provision of public services, it is worth noting that the share of SA and LSGA using the Internet reached 94.8% of the total number of institutions. An indisputable advantage of the digital economy development is the fact that all the placement of orders for the supply of goods, the performance of work and the provision of services for state and municipal needs can now only be performed using electronic trading platforms [3]

Also the development of the cloud services market potential should be mentioned. It is growing by about 40 percent annually. The leaders of the Russian market - Yandex, Sberbank, Mail.Ru are working on the creation of digital e-commerce platforms that actively monetize profits by working with high-tech startups and electronic applications.

All this shows positive trends in the digital information community development in the Russian Federation.

In Russia, ensuring the accelerated introduction of digital technologies in the economy and social sphere is one of the national development goals (Decree of the President of the Russian Federation of May 7, 2018 No. 204 "On National Goals and Strategic Tasks for the Development of the Russian Federation for the Period until 2024", hereinafter referred to as the Decree No. 204) [4]. For this, Decree No. 204 defines the following tasks: an increase in domestic costs for the digital economy development from all sources (by share in gross domestic product) by at least 3 times compared with 2017;

- creation of a stable and secure information and telecommunications infrastructure for high-speed transmission, processing and storage of large amounts of data, accessible to all organizations and households;
- the use of predominantly domestic software by state bodies, local authorities.

Digital projects also need to be planned – project work planning is performed on the basis of calendar plans and schedules, which are divided by executors, time parameters, types of work.

Presentation forms for calendar schedules - linear, network models, cyclograms.

We believe that to evaluate the digital projects effectiveness, indicators according to the UNIDO methodology

(UNIDO - United Nations Industrial Development) are suitable. The United Nations Industrial Development Organization (UNIDO) is a specialized agency in the UN system. The main goal of the organization is to promote and accelerate industrial development in developing countries and EIT countries, as well as promoting international industrial cooperation [5].

Indicators traditionally used for this purpose:

- simple and discounted payback periods for investments,
- net present value (NPV)
- internal rate of return (IRR),
- profitability index (PI).
- modified internal rate of return - (MIRR) [5].

Answering the question of whether their use in digital technologies is justified. One can say yes, because in the first place these projects should be considered as a subclass of investment, that is, the use of these indicators in planning and forecasting the effectiveness of evaluating digital projects is advisable.

How efficiently the enterprise will operate largely depends on how managers reliably predict the economic situation, anticipate the tactical and strategic actions of the organization on the market.

The role of forecasting in the enterprise functioning is undeniable. But the presence of uncertainties in the analyzed factors significantly complicates the control procedure.

There are a variety of forecasting methods. But, among them it is worth to highlight two groups - these are statistical and expert.

The statistical group description should start with the time series and the formation of trending models. The trend means a certain dependence on time, for the isolation of which various smoothing methods are used (exponential smoothing, etc.). To analyze the time series, the least squares method is used, heuristic techniques are used: moving average method, etc. Based on the data obtained, including statistical methods, methods of correlation and regression analyzes, it is possible to build a certain economic and mathematical model, which replaces some actual situation (the original) and is able to give new information about this studied phenomenon. They resort to the help of such modeling when it is necessary to predict work of a projected or probabilistic facility over a long period of time, when it is impossible to build an analytical model or there is also no possibility, or making observations on a real facility is costly.

Based on the developed models, a decision-making process is performed, which includes the following steps:

- preliminary formulation of the problem;
- determination of decision goals and selection of appropriate optimality criteria;
- identification and establishment of restrictions;

- compilation of a list of alternatives and their preliminary analysis in order to eliminate ineffective ones;
- collection of economic information and forecasting changes in decision parameters in the future;
- exact formulation of the task;
- development of a solution model;
- analysis and selection of a method for solving the problem and the development of an algorithm for solving;
- assessment of alternatives and selection of the most effective ones;
- decision making [7].

It should be noted that there are a lot of expert methods that are based on a survey of experts and various interpretations and discussions of their predictions and conclusions. Here are the main ones:

- brain storming. Initially, group members propose as many possible solutions as possible. The proposed solutions are not being criticized. A list of options that are analyzed, structured and finalized is formed;
- nominal group method. The team leader initially limits the interpersonal communication of the group members so they can formulate their own solutions. Then these options are presented to the group, ranked and the best one of them is taken as a basis, which is being finalized taking into account the group's comments;
- Delphi method. This method differs from the previous one by the fact that the group does not come together. Options for solving the problem are described on paper and sent to the head. The head analyzes them, selects the best options, which are sent back to the group members for individual analysis. This cycle is repeated until the best solution is formed or a conclusion about the fundamental impossibility of the project is made [8].

Combined expert methods that simultaneously use several forecasting methods are having a particular importance in recent years. Recently, Foresight technology has gained popularity. In 2006, as part of implementation of the innovative educational program of the National Research University – Higher School of Economics, the Foresight International Center was established as a structural unit of the Institute for Statistical Research and the Economics of Knowledge due to the increased interest in medium and long-term forecasting [9].

Based on a statement that “Foresight is a system of methods for expert evaluation of strategic areas of social, economic and innovative development, identifying technological breakthroughs that can affect the economy and society in the medium and long term period” [9], the foresight focuses on the practical measures development to approximate selected strategic guidelines. Foresight technologies involve

the simultaneous work of thousands of experts to assess the possible prospects for innovative development, including the digital economy. Pushing technological envelope, digital technologies are becoming one of the most pressing and relevant issues of human civilization.

#### IV. CONCLUSION

The main goal of innovative digital activity is the creation, accumulation and development of the scientific and technical potential of business entities, which will ensure their competitiveness, economic security and development. Today, the digital type of enterprises development is considered the main, and in some cases the only possible way to ensure, in a strategic perspective, significant economic growth of production [11].

Digitalization of industries leads to a change in demand for factors of production. Under the influence of digital technologies, not only individual sectors are transformed, but also the entire structure of the economy and cross-sectoral interactions.

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