

Analysis of the development and implementation of applied projects in the digital economy

Alexey P. Taburchak
 St. Petersburg State Institute of Technology
 (Technical University)
 Department of Business Informatics
 Saint-Petersburg, Russia
ta@inbox.ru

Svetlana M. Bychkova
 St. Petersburg State Institute of Technology (Technical
 University)
 Department of Management and Marketing
 Saint-Petersburg, Russia
smbychkova@mail.ru

Alina A. Butina
 St. Petersburg State Institute of Technology
 (Technical University)
 Department of Management and Marketing
 Saint-Petersburg, Russia
alina-butina@yandex.ru

Abstract — The relevance of the introduction of the digital economy in the modern system of relations between the state and society has been determined. The essence of the concept of “applied projects” in the framework of informatization and digitalization of the economy is highlighted. The concept of “initiative” is proposed as an integral part of applied projects. The algorithm of analysis and evaluation of the feasibility of the implementation of applied projects in the economy of the Russian Federation in modern conditions is considered. Various solutions for the analyzed applied projects are established. The distribution of responsibilities for the implementation of all stages of the assessment and approval of applied projects, as well as the allocation of areas of responsibility for the development, evaluation and implementation of applied projects are presented. The possibility of occurrence of risks of both an economic and legal nature was determined. The significance of applied projects for the development of an organization’s business has been highlighted as an exception and indicates a possible implementation of applied projects. The choice of financial performance accounting model for the execution of applied projects was analyzed for the benefits of each model. The possibilities of obtaining the economic efficiency of applied projects at the stage of execution and implementation of projects in the product portfolio of the organization are considered. The conclusions confirmed the need to apply applied projects within the framework of the digital transformation of the economy.

Keywords — *applied projects, digitalization, informatization, digital economy, analysis of applied projects, application project initiative*

I. INTRODUCTION

B The modern economy is actively developing due to the impact of information and innovative technologies that are transformative components of all business processes. The tendency to use digital technologies in business processes is gradually increasing, thus we can talk about digitalization of the economy. The rapidly developing information and

communication technologies contribute to the emergence and development of new effective management solutions, as well as new ways of conducting entrepreneurial practices. Existing ways of doing business are changing and transforming under the influence of digitalization, becoming more optimal, less costly and, accordingly, significantly accelerated. The productive and effective application of innovative technologies in the field of digitalization gives an impetus to a new understanding of the priority of the transition of the economy of the Russian Federation to a new level - the digital economy and the subsequent integration into the global digital economy [1].

Applied projects are increasingly being used to achieve these goals as part of the transition to a digital economy.

II. MATERIALS AND METHODS (MODEL)

In this study, the following scientific methods were applied: analysis and synthesis, induction, systematization

Applied projects (hereinafter referred to as AP) - projects for introducing and servicing products and solutions for industry informatization and enhancing security on the basis of technical infrastructure, software and hardware solutions of partner companies for corporate and government segments, and projects for creating unique products and services for individual customers / customer groups [2].

Applied projects are aimed primarily at promoting software and hardware solutions and services for the automation of various projects of state authorities, as well as projects of the industrial market segment (B2B - "business-to-business").

In the process of analyzing and evaluating applied projects or initiatives¹, that are included in the AP, and identifying their effectiveness, the management of the organization can take one of 5 decision options for the studied objects: the elaboration of elements, implementation, adjustment, deviation and sale of the project.

In cases where the project has a clear strategy, acceptable values of technical and economic indicators and an acceptable level of efficiency of its implementation, additional analysis of the possibilities of working out the project elements is required. A thorough presentation of all the nuances and features of the project allows you to more accurately determine the essence of the AP, which in the future will contribute to a clear process of implementation and operation, thereby minimizing the risks of unforeseen failures and malfunctions in the work on the selected applied project.

If the project complies with the stated requirements, it can be accepted for implementation. However, immediately before this stage, the procedures of coordination and approval are carried out, within the framework of which AP performance indicators are calculated.

In the case when the project cannot be accepted for implementation with existing both technical and financial features, it should go for an adjustment. The adjustment of the applied project means the change of any aspects of the formation of the AP due to the impossibility of its application and implementation in the proposed form on the current market conditions. An application project or initiative that is part of an application project may be rejected. This fact testifies to the complete unsuitability of the project or to excessively high risks, both of an economic and legal nature [3]. If the AP, which by its characteristics does not correspond to the organization's ideas about a normally functioning project, but has relatively high development prospects and positive indicators of future efficiency, then the firm may decide to sell the applied project to other firms. The sale of an application project is understood as the marketing of the concept, ideas, development and implementation programs, etc. [4].

The distribution of responsibilities for the implementation of all stages of the assessment and approval of the AP is presented in Table 1.

TABLE 1 - Allocation of responsibilities for the implementation of all stages of the assessment and coordination of AP

Stages	Event	Responsible unit
Creation	AP concept	Top management organization
	Development of technical specifications	Top management organization
	Study of project elements	Relevant Responsible Unit
	Formation of technical project documentation	Technical unit
	Project risk analysis	Relevant Responsible Unit
	Legal assessment of the transaction	Legal unit
	Formation of the accounting model of RAS / IFRS	Accounting
	Formation of plans for the promotion of AP	Relevant Responsible Unit
Initiation	Initiating the review of AP	Relevant Responsible Unit
Consideration	Ranking by project type and cost of the project	Relevant Responsible Unit
	Preparation of project costing	Relevant Responsible Unit
	Calculation of projected indicators for the implementation of AP	Relevant Responsible Unit
	Evaluation of the effectiveness of AP	Responsible unit, the management of the relevant responsible unit
Agreement	Project matching	The management of the relevant responsible unit
Approval	Project approval	The management of the relevant responsible unit
Implementation	Implementation of AP	Relevant Responsible Unit
	Legal support	Legal unit
Selling AP	Selling AP Concept	The management of the relevant responsible unit
Rejection of AP	AP deviation	The management of the relevant responsible unit
Correction of AP or Initiative	Amendments to the AP	Relevant Responsible Unit

For projects that require additional costs for their development and implementation, the course of the performance assessment and the decision-making procedure for the implementation of the AP are as follows.

The algorithm for the assessment and coordination of the AP is presented in Figure 1.

¹ An initiative is a part of an organization's applied project, which is a series of technically sound and commercially valuable for potential consumers, services aimed at generating income by a company that implements them.

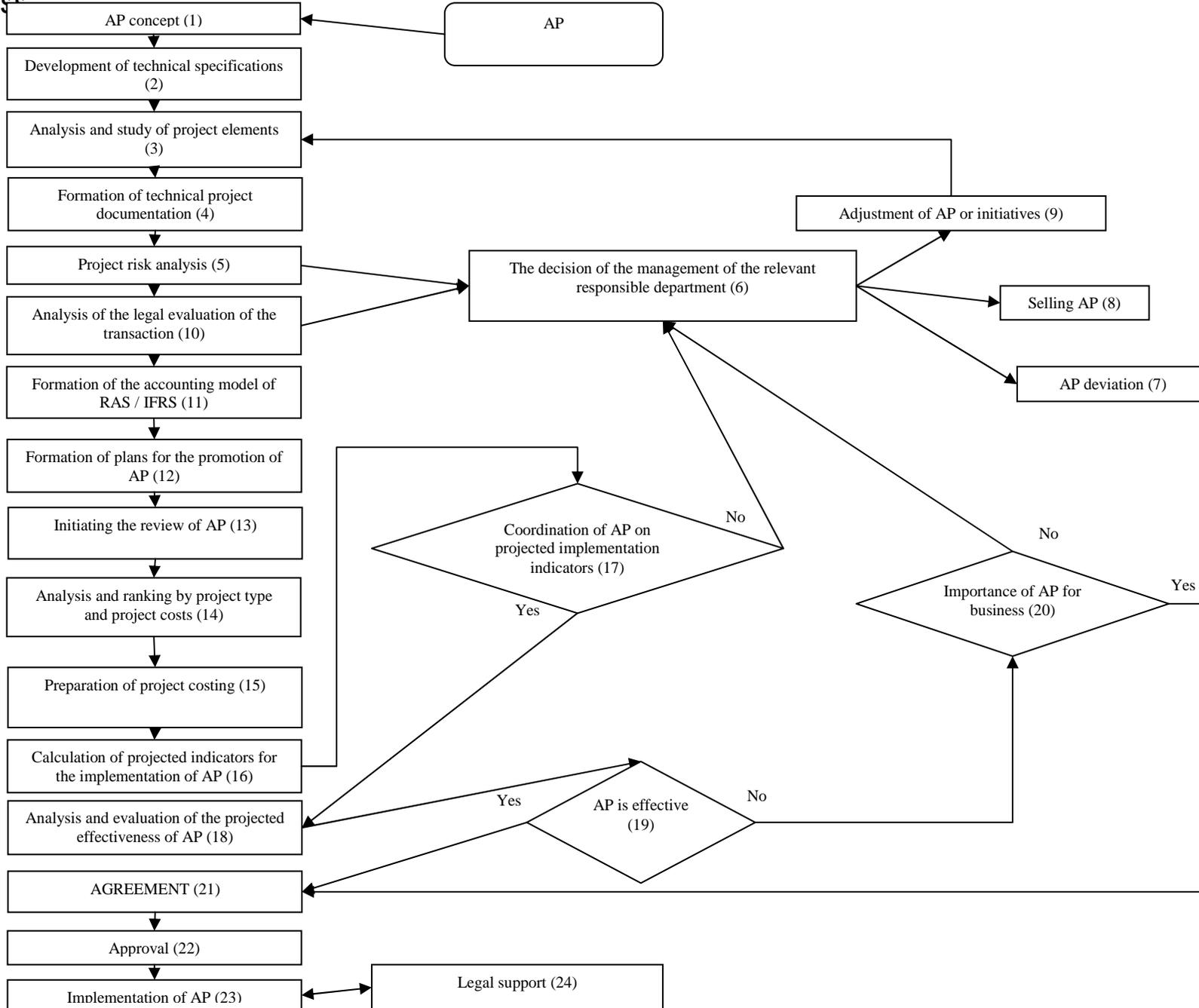


Fig. 1– Algorithm for the evaluation and coordination of AP

III. RESULTS AND DISCUSSION

Applied projects of interest to modern scientists from around the world. For example, scientists Yakymchuk, AY, Akimova, LM, Simchuk, TO in their study "Applied project approach in the national economy: practical aspects" [5] set as its goal the study of the approach to the study of applied projects and the possibility of its use in managing the economic development of various countries. Also, M. Florio paid special attention to applied projects in his work "Applied Welfare Economics: Cost-Benefit Analysis of Projects and Policies" [6]. The relevance and value of applied projects for the development of the economy of any country, wishing to become part of the global digital system was identified and described in the work W. Schafer "Project appraisal in practice" [7].

At the first stage of the analysis of the future applied project, the concept of software is developed, that is, the main idea or development plan, which is carried out by the top management of the organization. The development of the AP concept is presented in fig. 1 (block 1). The main stages of the development and development of projects are implemented for the most part by the management of the company, since the capital expenditures that are required to create a AP are large-scale in terms of funding. After determining the main direction of the implementation of the AP management of the organization formulates the terms of reference for the development of a detailed plan to identify the main stages of the creation of the AP. Development of technical specifications presented in Fig. 1 (block 2).

Under the terms of reference of the AP is understood a document that specifies a specific set of requirements for a future applied project. The formulated task is submitted for execution to the relevant responsible division of the organization, which is responsible for the field of activity of the company to which the future development will belong. Thanks to the technical task, clear goals and objectives are formulated, the essence of which is understandable for the contractor. Based on the goal, the responsible executor can plan in more detail the process of developing the elements of the applied project and carry out the work according to the outlined plan and refuse to perform activities that are not specified in the terms of reference [8]. This document greatly facilitates the work of the relevant responsible department for the description of the concept and details of the applied project.

The relevant responsible unit develops all elements of the project to determine the basic characteristics and characteristics of its life cycle at the implementation stage in the market. The stage of study of the elements is illustrated in fig. 1 (block 3). The analysis and optimization of the sequence of implementation of the project development activities is also carried out [9]. The whole process of elaboration is divided into stages, within the framework of which measures are being taken to form a holistic AP strategy. All subsequent stages of the study of elements of AP must be directly related and flow essentially from the previous stages of the creation of AP.

At the next stage of the development of technical documentation for the project (Fig. 1 (block 4)), a preliminary design is created, according to which the primary calculations of the main technical and economic indicators of the future applied project are carried out at all stages of the life cycle [10].

Further, the relevant responsible unit analyzes the main risks that may adversely affect the possible implementation of the AP. The stage of risk analysis of AP is presented in Fig. 1 (block 5). The main risks of application of applied projects should be systematized. Then, a description of the essence of each risk and threat for the firm is required for all applied projects. In the case when the risks of the project are too significant and can significantly affect the outcome of the implementation of the AP, the responsible department of the organization should, with the involvement of top management of the organization, determine the degree of significance of this project for the development of the company's business as a whole. If the significance of the project cannot be determined and confirmed, the management of the responsible unit may reject the AP (Fig. 1 blocks (7-9)), sell the AP, send the AP to the adjustment [11]. The decision of the management of the relevant division is presented in Fig. 1 block (6) The management of the relevant responsible department decides on the sale of the AP (Fig. 1, block (8)) if it cannot be implemented in this organization, but there are other companies interested in purchasing the AP. The application project can be sent to the correspondent fitting (Fig. 1 block (9)) with the possibility of implementation after making changes that will allow the software to meet the stated requirements and market conditions. In this case, the software must re-work the modified elements (Fig. 1, block (3)), adjustments to the technical documentation (Fig. 1 block (4)). After the above steps, an additional analysis of all possible risks is carried out and the degree of their threat to future profits from the implementation of the AP is determined [12]. If the project is significant for the enterprise, then it can be sent for further consideration and analysis in the next stage of the decision-making process on the project implementation, namely the legal assessment of the AP transaction, which is presented in Fig. 1 block 10.

After conducting a risk analysis of AP, the legal department of the company carries out a legal assessment of the future project (Fig. 1 (block 10)).

Next, a model should be developed for accounting for financial indicators of applied projects (Fig. 1, block (11)). It is recommended to base any economic assessment on filling in data according to international financial reporting standards (IFRS) or Russian financial reporting standards (RAS).

IFRS reporting is aimed, in most cases, at reflecting the real state of affairs and is most convenient for interpretation, therefore it is of great value for investors and creditors. Reporting, formed according to the standards of RAS, has a rather strict formal appearance. The main emphasis in the formation of the financial component of the AP is made on a clear consolidation of the name and sequence number of each article, which allows to significantly simplify the process of checking and monitoring the reporting process.

After determining the financial performance accounting model, the relevant responsible department develops a strategy for market promotion or forms AP promotion plans (Fig. 1, block 12). The target market segment is chosen and determined for the implementation of the applied project under consideration. Then the main elements of the project positioning system are formulated on the market. Also an integral part of the process of developing a promotion plan is to analyze the future market opportunities from the development prospects of the AP [13].

According to the results of all the above stages, the division responsible for the applied project initiates a review (Fig. 1, block (13)) and a more detailed analysis at the management level of the responsible division. This stage includes the provision of all information on the developed application project.

Next, the applied project is ranked by type and volume of costs (Fig. 1, block (14)). At this stage, features of the AP are identified, which fundamentally signal the assignment of the project to one of three types of projects.

After identifying the type of project, a project calculation is formed (Fig. 1, block 15), within which the basic technical and economic indicators of the project are calculated, such as, first of all, the volume and cost structure, expediency and optimality of the cost component of the project, etc. Project costing is carried out by the relevant responsible division of the organization and is transferred to the management of the division to make a decision on the implementation of the project.

Based on the results of the project calculation, a forecast calculation is made of the planned results of the implementation of the applied project by the business segment, which has developed the entire project as a whole. The calculation of the forecast indicators of the implementation of the applied project (Fig. 1, Block (16)) is made by the department responsible for the AP. The following indicators are calculated: gross margin (Gross Margin), forecast revenue, profit.

The economic substantiation of the effectiveness of the implementation of applied projects can be made by comparing the gross margin criterion (Gross margin) for this applied project with the target gross margin (Gross margin) [14]. Coordination of AP on the forecast indicators of implementation is presented in Fig. 1 block (17).

In case of compliance of the PP indicators with the desired values, the corresponding responsible department, together with the management, assesses the effectiveness of the applied project (Fig. 1 block (18)). The decision on the economic feasibility of implementing an application project is made, first of all, by the management of the business segment, in which the idea of implementing the AP was initiated after the project evaluation. Then the applied project is approved at the management level of the company as a whole [15]. To determine the effectiveness of a future project, indicators such as project profitability, net present value of the project, estimated future profit levels, etc. are calculated.

If the project demonstrates positive efficiency values based on the calculations made (Fig. 1, block (19)), the AP is sent for approval to the management of the relevant responsible unit (Fig. 1, Block (21)). If the project is not sufficiently effective, then the project is evaluated by the management of the relevant department for its importance for business development (Fig. 1, block (20)). In the case of non-compliance of the AP with the declared significance parameters, the decision is made to reject or sell the applied project (Fig. 1, block (6)). Also, the project can be sent for revision, and then again passes all the stages associated with the development and analysis of software [16].

In case of confirmation of the effectiveness of a future AP project, the management of the relevant responsible department coordinates the analyzed applied project (Fig. 1 block (21)).

After coordination and approval of the AP (Fig. 1 block (22)), the project start-up stage for implementation begins (Fig. 1 block (23)). In parallel with the execution of the project, the legal division of the organization provides legal support for the implementation process (Fig. 1, block (24)) to ensure the legality of transactions.

IV. CONCLUSION

Digital economy, within the framework of which analysis and implementation of applied projects take place, forms the relevance of transformation of the economy both at the micro level, that is, in a single business segment, and at the level of various sectors of the economy. This allows you to form an increasing interest in the opportunities, problems, benefits and risks of the development of the economy as a whole [17].

To improve the business management system within the digital economy, a clear understanding of the basis of the processes, things, systems, and phenomena that are going on in today's changing world is necessary. The correctness of the priorities set is the key to successful economic development. The main objective of the transition to the digital economy is a gradual transition to digital transformation and obtaining the desired result in the shortest possible time. Due to the constant analysis and assessment of the feasibility of the implementation of applied projects, improvements are made in individual business processes and the economy as a whole.

References

- [1] Shraiberg Ya.L. Formirovanie edinogo prostranstva znaniy na baze setevoy informatsionnoy infrastruktury v usloviyakh stanovleniya i razvitiya sovremennoy tsifrovoy ekonomiki: ezhegodnyi doklad IV Mezhdunarodnogo professional'nogo foruma «Krym-2018» [Formation of a common knowledge space based on the network information infrastructure in the conditions of formation and development of the modern digital economy: annual report of the IV International Professional Forum "Crimea-2018"]. - M.: GPNTB Rossii, 2018. – 87p.
- [2] Lepov V.V. «Tsifrovaya ekonomika» i budushchee chelovechestva [Digital Economy and the Future of Humanity] // Nauka i tekhnika v Yakutii [Science and technology in Yakutia]. - 2018. - N 1. - pp.12-36.
- [3] Bachilo I.L. Tsifrovizatsiya upravleniya i ekonomiki - zadacha obshchegosudarstvennaya [Digitalization of management and economics

- is a national task// Gosudarstvo i pravo[State and Law]. - 2018. - N 2. - pp.59-69.
- [4] Alekseenko O.A. Tsifrovizatsiya global'nogo mira i rol' gosudarstva v tsifrovoi ekonomike [Digitization of the global world and the role of the state in the digital economy]/ O.A.Alekseenko, I.V.II'in // Inform. obshchestvo[Information society]. - 2018. - N 2. - pp.25-28.
- [5] Yakymchuk, A. Y.; Akimova, L. M., Simchuk, T. O. Applied project approach in the national economy: practical aspects // Scientific bulletin of polissia. – 2017. - №2. – pp.170-177.
- [6] M. Florio. Applied Welfare Economics: Cost-Benefit Analysis of Projects and Policies. - ROUTLEDGE Publ., 2014. – 412p.
- [7] . Schafer. Project appraisal in practice // Weltwirtschaftliches archiv-review of world economics. – 1979. - №2(115).- pp.393-395.
- [8] Fatkhutdinov R.A. Strategicheskaya konkurentosposobnost': uchebnyk [Strategic competitiveness: a tutorial]/ R.A. Fatkhutdinov. - M. : ZAO «Ekonomika Publ.», 2005. - 504 p.
- [9] Yasenev, V.N. Informatsionnye sistemy i tekhnologii v ekonomike: Uchebnoe posobie [Information systems and technologies in economics: study guide]/ V.N. Yasenev. - M.: YuNITI, 2014. - 560 p.
- [10] Birman G. Ekonomicheskii analiz investitsionnykh proektov [Economic analysis of investment projects] / Birman G., Schmidt S. - M. : YuNITI Publ., 2004. - 236 p.
- [11] Truntsevskii Yu.V. Tsifrovaya integratsiya - put' v budushchee [Digital integration - the path to the future] / Yu.V.Truntsevskii, A.A.Efremov // Mezhdunar. publ. i chastnoe pravo [International public and private law]. - 2018. - N 1. - pp.6-12.
- [12] Bocharov V.V. Vnutrifirmennoe finansovoe planirovanie i kontrol' [In-house financial planning and control] / V.V. Bocharov. - SPb. : SPbGUEF Publ., 2010. - 339 p.
- [13] Lusch, R. W. (2011). A Stakeholder-Unifying, Cocreation Philosophy for Marketing. *Journal of Macromarketing*, 2(31), pp. 129-134.
- [14] Ivasenko, A.G. Informatsionnye tekhnologii v ekonomike i upravlenii: Uchebnoe posobie [Information technology in economics and management: Tutorial] / A.G. Ivasenko, A.Yu. Gridasov, V.A. Pavlenko. - M.: KnoRus Publ., 2013. – 158 p.
- [15] Vaipan V.A. Osnovy pravovogo regulirovaniya tsifrovoi ekonomiki [Basics of legal regulation of the digital economy] // Pravo i ekonomika [Law and Economics]. - 2018. - N 11. - pp.5-18
- [16] Grabchak E.P. Kak sdelat' tsifrovizatsiyu uspeshnoi [How to make digitalization successful] / E.P.Grabchak, E.A.Medvedeva, I.G.Vasil'eva // Energeticheskaya politika [Energy policy]. - 2018. - № 5. - pp.25-29.
- Ageev A.I. Bitva za budushchee: kto pervym v mire osvoit noomonitoring i kognitivnoe programmirovaniye sub"ektivnoi real'nosti? [The battle for the future: who will be the first in the world to master noomonitoring and cognitive programming of subjective reality?] / A.I.Ageev, E.L.Loginov // Ekon. strategii [Economic strategies]. - 2017. - T.19, N 2. - pp.124-139