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ANALYSIS OF RISK FACTORS FOR APPLIED PROJECTS IN A DIGITAL ECONOMY

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Received 15 November 2021; accepted 11 January 2022; published 30 March 2022

Annotation. The article substantiates the relevance of the processes of digitalization and informatization of the economy. The concept of applied projects and initiative of applied projects is considered. The relevance of the application of applied projects in the context of modern digitalization of the economy has been proved. The features of the functioning of applied projects are highlighted. Three categories of applied projects are considered, depending on the cost structure. Particular attention is paid to the risk factors that must be taken into account for full-fledged uninterrupted work on the creation and execution of applied projects. A set of universal risks was compiled for all three categories of projects. The need for an analysis of risk factors has been determined. Risk assessment models are proposed for applied projects requiring investment of capital costs both within and above the budget established by the organization, and operational applied projects. Practical testing of the proposed models is presented on the example of the “Smart City” applied project of PJSC “Rostelecom”. The conclusions prove the feasibility of assessing risk factors in relation to a specific applied project. It has been established that without a systematic and regular analysis of the organization's activities for the execution of applied projects, as well as without identifying and promptly identifying risks to the organization's work at all stages of the life cycle of an applied project, it is impossible to implement applied projects as a whole.

Keywords: digital economy; applied projects; risks of implementing applied projects; applied projects requiring capital expenditures; applied projects requiring incurring operating costs

Reference to this paper should be made as follows: Taburchak, A.P., Bychkova, S.M., Butina, A.A. 2022. Analysis of risk factors for applied projects in a digital economy. *Entrepreneurship and Sustainability Issues*, 9(3), 152-172. [http://doi.org/10.9770/jesi.2022.9.3\(10\)](http://doi.org/10.9770/jesi.2022.9.3(10))

JEL Classifications: G32, O22, O31

1. Introduction

The relevance of the chosen topic is due to the rapidly developing economy of the Russian Federation and its transition to a fundamentally new level - digital (Irtysheva, 2020; Backhaus, 2021). The current foundations of doing business do not always allow to quickly respond to changes in the external environment of the organization. The digital economy makes new demands on organizations in terms of restructuring the entire business infrastructure to make optimal and effective decisions (Florio, 2014). The main task of the transition to the digital

economy is a gradual transition to digital transformation and obtaining the required result as soon as possible (Miroslavskaya, Kozyrev, 2021; Garcez, Silva, Ricardo, Franco, Mário, 2021). The use of modern digitalization tools ensures the stability of the company's existence in new conditions (Rincón-Moreno, Ormazábal, Jaca, 2021). These tools are applied projects (hereinafter AP).

Applied projects are aimed at promoting software and hardware solutions and services for the automation of various projects of public authorities, as well as projects of the industrial market segment. Applied projects are the missing link in creating a chain of business transformation on a digital innovation basis in the current realities. Thanks to regular analysis and assessment of the feasibility of implementing applied projects, individual business processes and the economy as a whole are being improved.

An applied project is a system of unique solutions for an organization, therefore, a set of risks is formed based on the characteristics of each applied project and the conditions for its implementation (Bychkova, Butina, 2018). Not only the specificity of applied projects plays a key role in determining the most important financial risks for an enterprise, but the scope of implementation of applied projects is also important. Depending on the conditions and directions of the execution of applied projects, the composition of the conditions of the factors influencing the activities of the enterprise also changes. Moreover, with the same composition of risk factors, the degree of their influence can differ significantly when an applied project gets into one or another environment of the digital economy.

In this study, the following scientific methods were applied: analysis and synthesis, induction, systematization. The purpose of this study is to develop a methodology for analyzing and assessing risks by types of applied projects, which contributes to the safe functioning of the organization, as well as the prevention of external and internal factors of threats. These developments allow the company to determine the value of the applied project for the organization and, in the future, analyze and predict its state in the content of the digital economy.

2. Typology of applied projects

All applied projects that can be implemented in a company as part of the development of the information society and the digital economy, according to the types of financial resources, can be conditionally divided into 3 categories (Bychkova, Gogua, Butina, 2019):

- Applied projects requiring capital expenditures in excess of the organization's established budget;
- Applied projects requiring capital expenditures within the budget established by the organization;
- Applied projects requiring investment of operating costs.

Applied projects should be characterized as projects with a high degree of implementation and execution uncertainty. This means that the development and design of applied projects cannot be imagined without a risk factor. The more innovative the solution for applied projects and the longer the planning horizon covers the entire process of creation and implementation, the higher the risk. Applied projects, like no other projects, are subject to the influence of risk factors, since they are a direct tool for the development of the digital economy. The instability of external factors also gives rise to a high degree of uncertainty.

In the process of analyzing and assessing possible risks, the main goal is to determine the likelihood of a threat, assess its possible impact and calculate the duration of the impact of these risks on the organization's work on applied projects. The likelihood of the occurrence of risk factors is directly related, first of all, with the general position of the company in the market, with its financial stability, as well as with the market situation and the prospects for its change.

The stability of the organization is determined by the ability of the firm to compensate for risk circumstances and continue to develop and execute applied projects (Malladi et al., 2021). The presence of a sufficient amount of resources allows neutralizing threats.

The authors identified the following as the main universal risk factors associated with the development and implementation of applied projects:

1. Insufficiently high values of the main technical and economic indicators of the effectiveness of an applied project, for example, payback period, profitability, etc.;
2. Impossibility to execute applied projects due to lack of technical capability (lack of required equipment, impossibility to ensure implementation and maintenance of an applied project);
3. Insufficiently complete and objective assessment of the significance of applied projects for the organization in the medium and long term, taking into account the further implementation in the digital economy markets;
4. Lack of reliable data for the formation of forecasts regarding the occurrence of receivables during the execution of applied projects;
5. Incorrect analysis and assessment of the forms, methods and means of interaction between the main subjects and participants in the creation and implementation of applied projects.

The degree of uncertainty and the possibility of the appearance of risk factors directly depends on the state of the organization, including the financial one, on the stability in the market, as well as on the conditions of the external environment, which is strongly influenced by the digital economy. Application projects can be implemented as a whole as a single service, or a part of an application project can act as an independent service. Initiative is a part of an application project that can be implemented as a constituent element of an application project, or be independent of it and be implemented as a finished product for the consumer. Not only the applied projects themselves, but also their initiatives are analyzed and evaluated for effectiveness from the moment the concept was created to the direct conclusion of a contract for their implementation and subsequent maintenance and support. At the same time, the changing market conditions influenced by the digital economy should be taken into account when forming a conclusion regarding the viability of projects in various segments.

When analyzing and assessing the occurrence of risk factors, it is advisable to identify the strength of the possible influence of these circumstances on the organization's work on an applied project in particular and the entire company as a whole. In addition to the degree of the impact, it is necessary to take into account the likelihood and duration of the impact of external and internal risks. Moreover, within the framework of making a management decision regarding the feasibility of introducing an applied project into the product portfolio of an organization, it is necessary to forecast the dynamics of changes in the main technical and economic indicators, which are most strongly influenced by risk factors. Forecasting is carried out on the basis of analysis and assessment of the financial condition and sustainability of the organization itself.

From the point of view of the most rational planning of further work on applied projects, it is necessary to carry out the forecasting process taking into account the occurrence of all possible risks that can significantly affect the activities of the enterprise, especially under the influence of the changing conditions of the digital economy. Significant risks should be understood as a certain set of factors, both external and internal, that negatively affect the organization's capabilities in terms of the development and execution of applied projects. With critical values of their possible occurrence, these risk factors can significantly affect the economic performance of the organization in the chosen direction (Bychkova, Butina, 2019).

The authors identified the following significant risks for the company in the implementation of the AP:

- increase in terms of implementation of the project or its components;
- increased volume of implementation costs;
- non-observance of the criteria for the quality of services provided under the project;

- decrease in the interest of potential consumers of the selected segment to the services of the new project;
- decrease in the profitability of the project.

The implementation of an applied project should be based on a full analysis and assessment of the effectiveness and profitability of this project for the enterprise, both in the short and long term. Subject to significant changes in the processes of implementation and execution of applied projects, such a development option is possible as a complete or partial rejection of the selected project, or re-consideration for making adjustments both to the basic concept and to individual components and initiatives.

For each type of applied projects, there are several universal risk factors that are likely to have an impact on the life cycle of applied projects (Sorescu, Schreier, 2021). These factors are not final, since each applied project has unique specific characteristics and the composition of risk factors directly depends both on a separate project and on the conditions for its implementation in the digital economy markets.

3. Analysis and assessment of risk factors for applied projects that require incurring capital costs in excess of the organization's budget

A set of risk factors for applied projects requiring capital expenditures in excess of the budget established by the organization is shown in Figure 1.

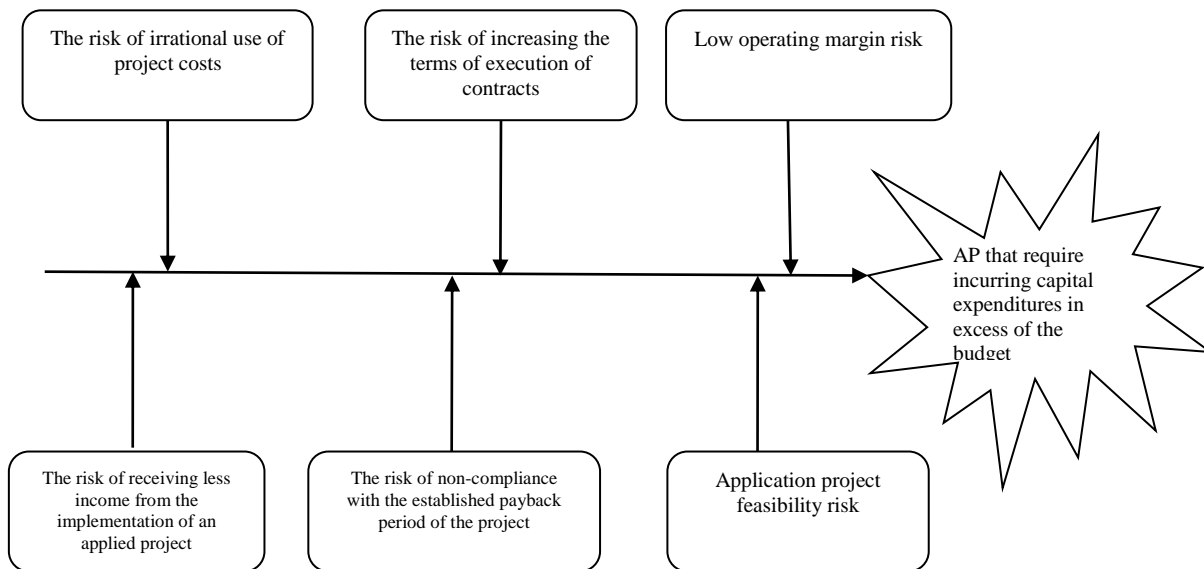


Figure 1. Risks for applied projects requiring capital expenditures in excess of budget
Source: developed by the authors

For the primary analysis of applied projects of all types, a model for determining the degree of risk and the possibility of its occurrence can be proposed. Within the framework of this model, it is proposed to divide the values of risks on a 5-point scale, where 1 - the risk is maximum, 5 - the risk is insignificant. Also, each risk is assigned a weight coefficient, which indicates the importance and significance of this risk for the project and for the financial stability of the enterprise as a whole (Nagy, 2020). Based on the results of applying this multi-criteria method for analyzing the risks of applied projects, it is necessary to calculate the total risk assessment of the project to determine the feasibility of introducing it into the organization's product portfolio.

The risk of a low level of operating profit margin from the execution of an applied project in excess of the budget indicates an insufficient amount of cash receipts. Each organization independently sets the threshold value of this indicator based on the current position of the company in the market, as well as based on data on changes in environmental factors and risk components.

Figure 2 shows the conditions for scoring the risk factor "operating profit margin" for applied projects in excess of the established budget.

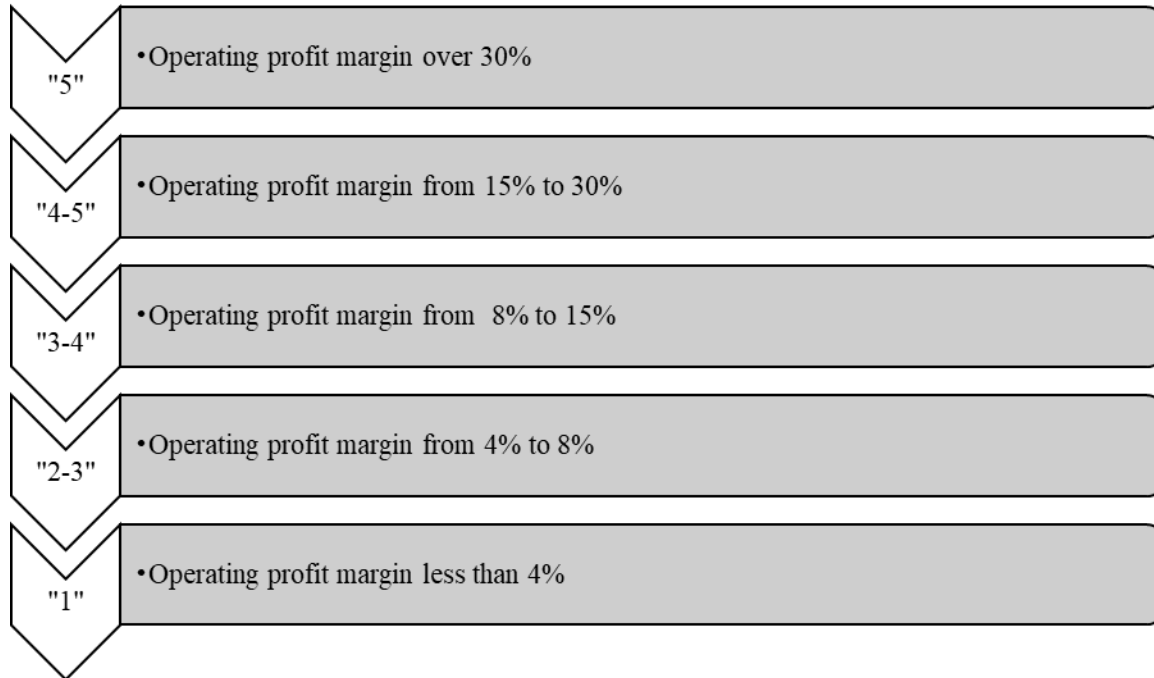


Figure 2. Conditions for scoring the risk factor "operating profit margin" for applied projects requiring capital expenditures in excess of the established budget

Source: developed by the authors

In general, it can be noted that if the level of the operating profit margin is in the range from 10% to 30%, then the effect of the project implementation may be positive and an additional assessment of the possible profitability indicators of the applied project is required. Moreover, based on these values of the operating profit margin, it is necessary to predict the receipt of additional income for the planned implementation period. If the values of the gross margin level are less than 10%, the project should be abandoned or significant changes to the terms of reference of the developed project should be made. However, it should be noted that in cases of special value of an applied project for an organization or for society as a whole, a decision may be made to continue the implementation of this project.

Within the framework of the risk of implementation or feasibility of an application project that requires incurring capital costs in excess of the budget, it is advisable to determine the conditions under which the analyzed application project can be accepted for execution or rejected due to the impossibility of implementation (Wirtz, Müller, Schmidt, 2020).

Figure 3 shows the rules for scoring the feasibility risk factor for projects over budget.

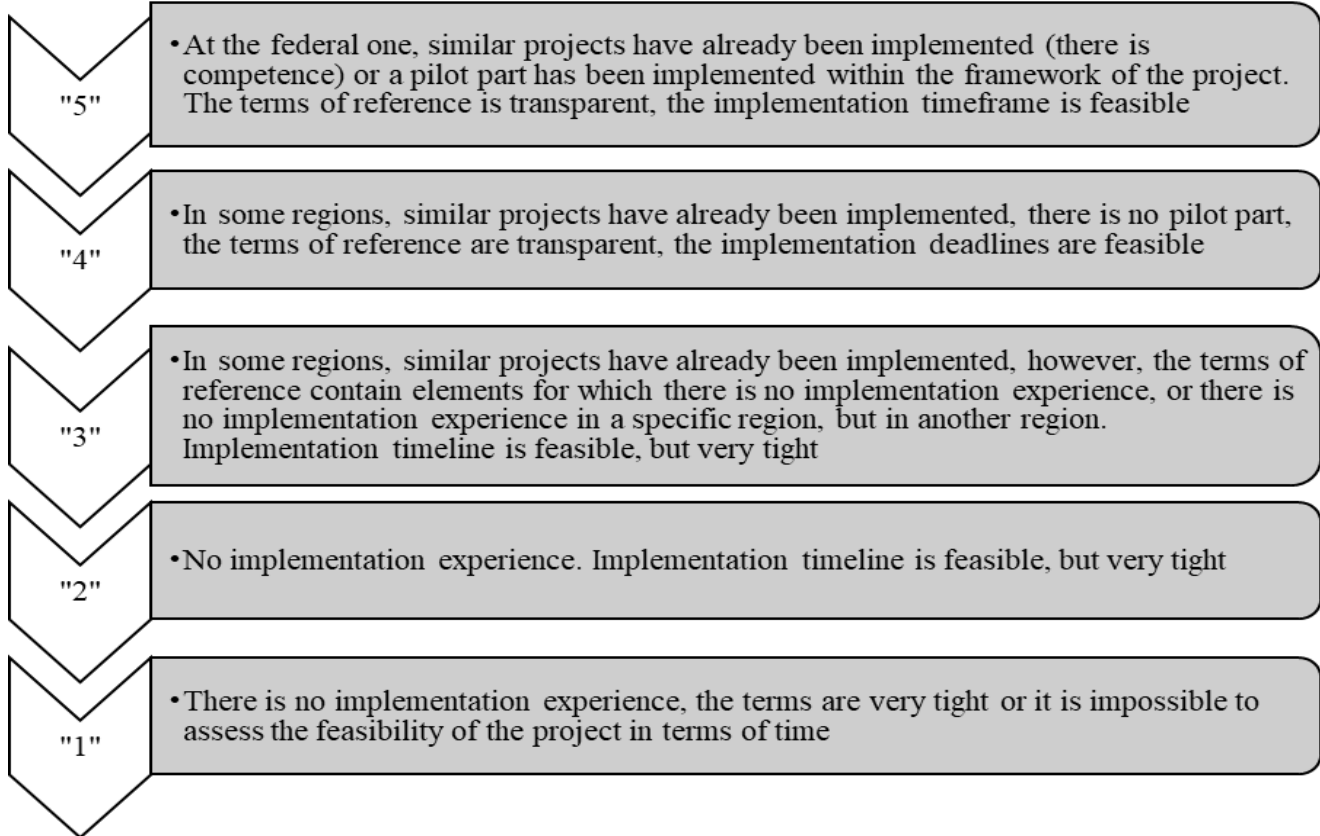


Figure 3. Conditions for scoring the “feasibility of an applied project” risk factor for applied projects requiring capital expenditures in excess of the established budget
Source: developed by the authors

In cases where the organization has experience in the execution of projects of this kind and their economic efficiency and profitability are proven by positive values of the main technical and economic indicators, then this initiative or the project itself can be implemented in the organization's portfolio.

If the pilot part of the applied project has already been implemented in the course of assessing the possible prospects of the project itself as a whole and the results of this implementation did not have a negative impact on the activities of the organization and the implementation conditions were acceptable and acceptable for the selected project, then the above risk cannot be considered significant (Ganichev, Koshovets, 2021). This means that further work with an applied project is possible for this factor. It should also be taken into account that the terms of reference for both the pilot part and the full-fledged project should be worked out in detail to simplify the process of putting into practice and operation. To level this risk factor, the timing of the implementation of the applied project is of great importance. If the terms are feasible, then there is a safety reserve for making a decision to eliminate negative factors affecting the result of work on an applied project.

In the absence of experience in the execution of applied projects in the branches of individual regions, however, there is experience of working with a similar project at the head office and the terms of reference were partially implemented in other regions, feasibility risk of the applied project is reduced. It should be noted that in this case, a qualitative detailed analysis of the experience of project execution, as well as the possibility of applying and adapting the concept to certain conditions in which it is planned to work with this applied project, should be

carried out. Moreover, the time frame for implementation should be sufficient to make it possible to promptly make changes to the current terms of reference for the most productive and efficient execution of projects. The most undesirable result of working with the risk of feasibility of an applied project is a complete lack of experience in project execution and a very long payback period, the presence of which contributes to the receipt of negative cash flows from the implementation of such projects. In this case, a change in the plan or a complete refusal to work on this applied project is most acceptable. However, it should be noted that the high significance of this or that project for the further development of the organization, which does not exclude additional research on the feasibility and effectiveness of the development of an applied project.

The risk of an increase in the terms of execution of a profitable contract is directly related to the indicator of the payback period of applied projects. To eliminate difficulties with the discrepancy between the terms of the contractual relationship and the payback period of the applied project, it is necessary to take into account the following conditions, which are presented in Figure 4. Using these rules for scoring the above risk factor, the organization can fully make decisions on the methods and tools for project execution, taking into account possible negative influences from the external environment from the position of this risk.

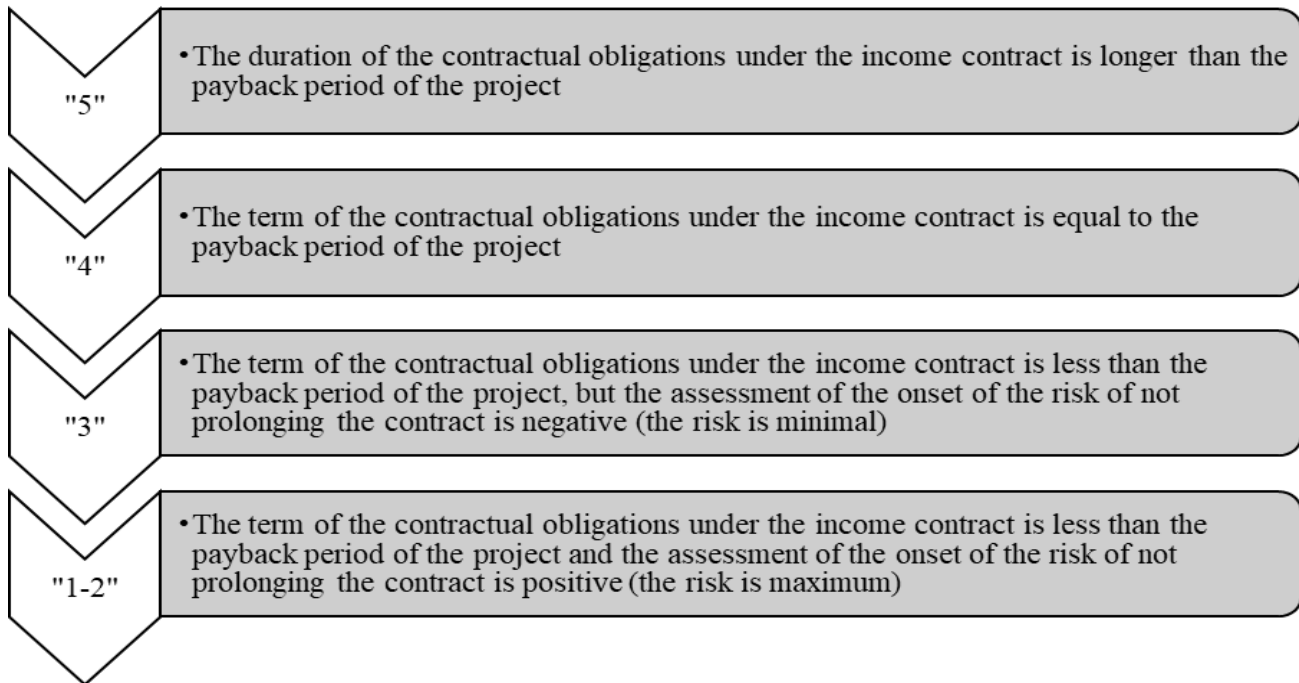


Figure 4. Conditions for scoring the risk factor "increase in the terms of execution of contracts" for applied projects that require incurring capital expenditures in excess of the established budget

Source: developed by the authors

The most preferable is the situation when the term of the contract significantly exceeds the payback period of the applied project. In this case, the project can be implemented in its original form without introducing fundamental changes to the structure of the terms of reference. With an increase in the payback period, both through the fault of the organization itself and due to independent circumstances, the risk of an increase in the terms of execution of contracts increases due to the need to combine the payback periods and the terms of profitable contracts in terms of prolongation of contractual obligations. The increase in the terms of the execution of contracts may negatively affect the work with potential customers and interested parties. If such difficulties arise, it is necessary to assess

the applied projects that require incurring capital costs in excess of the budget established by the organizations. Analysis and evaluation of the effectiveness of the implementation of applied projects can be carried out using the methodology for calculating the net present value. With regard to the identification of this risk, the results of calculating the net present value indicator indicate the feasibility of further work with an applied project or an unequivocal refusal to execute it.

Payback time is one of the most important metrics for evaluating performance for application projects requiring capital expenditures, especially over budget. An increase in the payback period of an applied project can cause a loss of profitability from its implementation. Analysis of the possible time interval for the payback of an applied project allows the organization, as well as all interested parties, to make a decision about the viability of the applied project and the optimal timing of obtaining a financial result from its implementation. Positive cash flows that are remote from the fact of the beginning of the implementation of an applied project do not lend themselves well to accurate forecasting, which means they are more risky compared to receipts at the initial stages (Taburchak, Tebekin, Petrov, 2020b). Therefore, the shorter the payback period, the less risky an applied project can be considered. Moreover, applied projects are implemented in sectors of the digital economy that are subject to rapid technical and technological changes with a high degree of probability. This means that the management of the organization is interested, first of all, not in the profitability of the applied project, but in the liquidity of capital investments, that is, in accelerating the terms of recovering investments in the project. (Taburchak, Tebekin, Petrov, 2020a). Thus, the determination of the approximate payback period of an applied project is an integral procedure for analyzing the effectiveness of the execution of an applied project. From the point of view of assessing the possibility of the occurrence of this risk, one can consider the conditions for issuing estimates for it. The conditions for setting assessments for the risk factor “failure to comply with the established payback periods of the project” are shown in Figure 5.

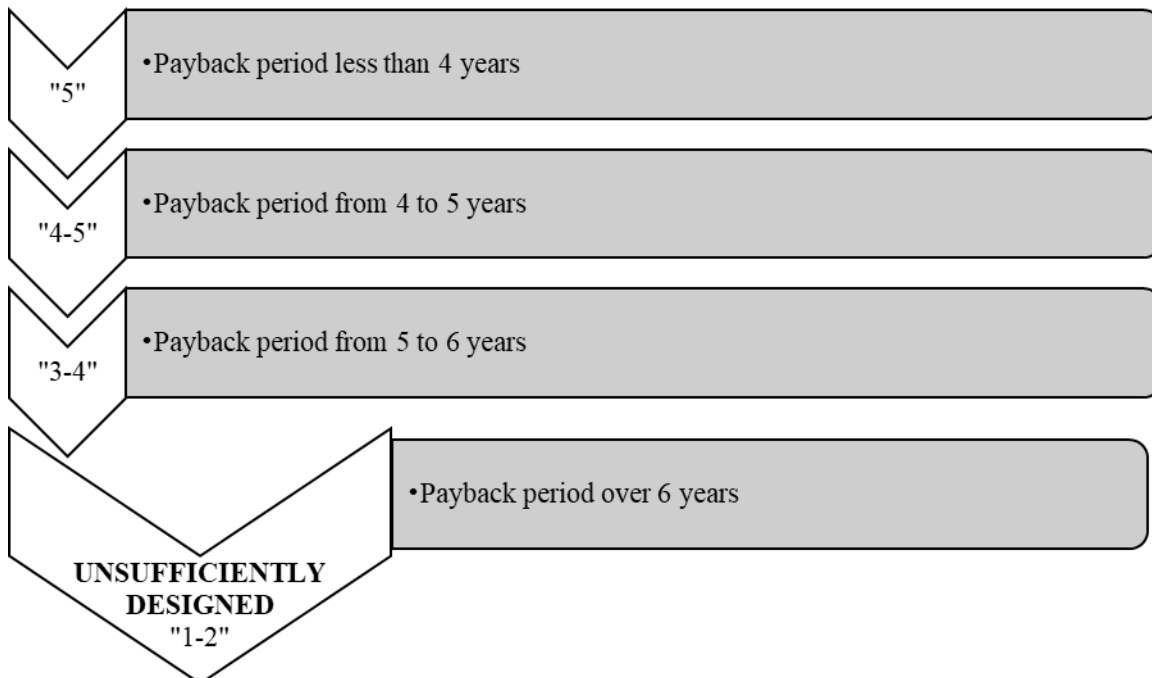


Figure 5. Conditions for scoring the risk factor "failure to comply with the established payback period" for applied projects requiring capital expenditures in excess of the established budget

Source: developed by the authors

If the payback period of the applied project is less than 4 years, then this project can be unambiguously accepted for execution, since the probability of occurrence of super-risks is relatively low, therefore, the planning and implementation of the applied project can be considered reasonable and expedient.

If the payback period exceeds 6 years, then this project in the long term will not be effective and desirable for implementation. In this case, it is required to change any aspects of the formation of an applied project due to the impossibility of application and implementation in the proposed form on the current market conditions. After the adjustment, the applied project is again sent for re-analysis and examination. It can also be either agreed and accepted for work, or sent for additional correction, or rejected.

If the project is completely unsuitable, a decision is made to refuse implementation due to excessively high risks of both economic and legal nature (Osipov, Yudina, Geliskhanov, 2019). The analyzed project can bring additional costs to the company, even unreasonable ones, which can adversely affect the dynamics of the organization's life cycle.

When assessing the risk factor "payback period", it is necessary to apply the scenario method. Organizations need to develop coherently consistent scenarios based on combinations of key driving forces. The digital economy offers more and more new forms and methods of implementing business processes and changes in the conditions of their implementation.

Therefore, it is advisable, within the framework of the analysis of this risk for applied projects, to consider 3 possible scenarios for the development of events: pessimistic, realistic and optimistic in order to obtain a comprehensive picture and possible forecasting of results. Based on the comparison of the results of all three scenarios, the management of the organization can make competent management decisions regarding the likelihood of risks occurring in a particular scenario. Decision making should be based on the availability of resources and reserves to continue working on applied projects, taking into account the possibility of adverse market conditions. In the event of a pessimistic scenario, as a result of work on the projects under consideration, there will be no margin of safety for obtaining positive results from the implementation of applied projects.

The risk of irrational use of project costs arises if the organization does not have experience of practical work with this kind of applied projects or in the main technical documentation there is no full specification of all stages of development, execution and further maintenance with the obligatory clarification of the units responsible for each stage (Ivanov, Malinetskiy, 2017).

Figure 6 shows the main conditions for scoring to analyze the risk of misuse of costs for applied projects that require capital expenditures in excess of the budget.

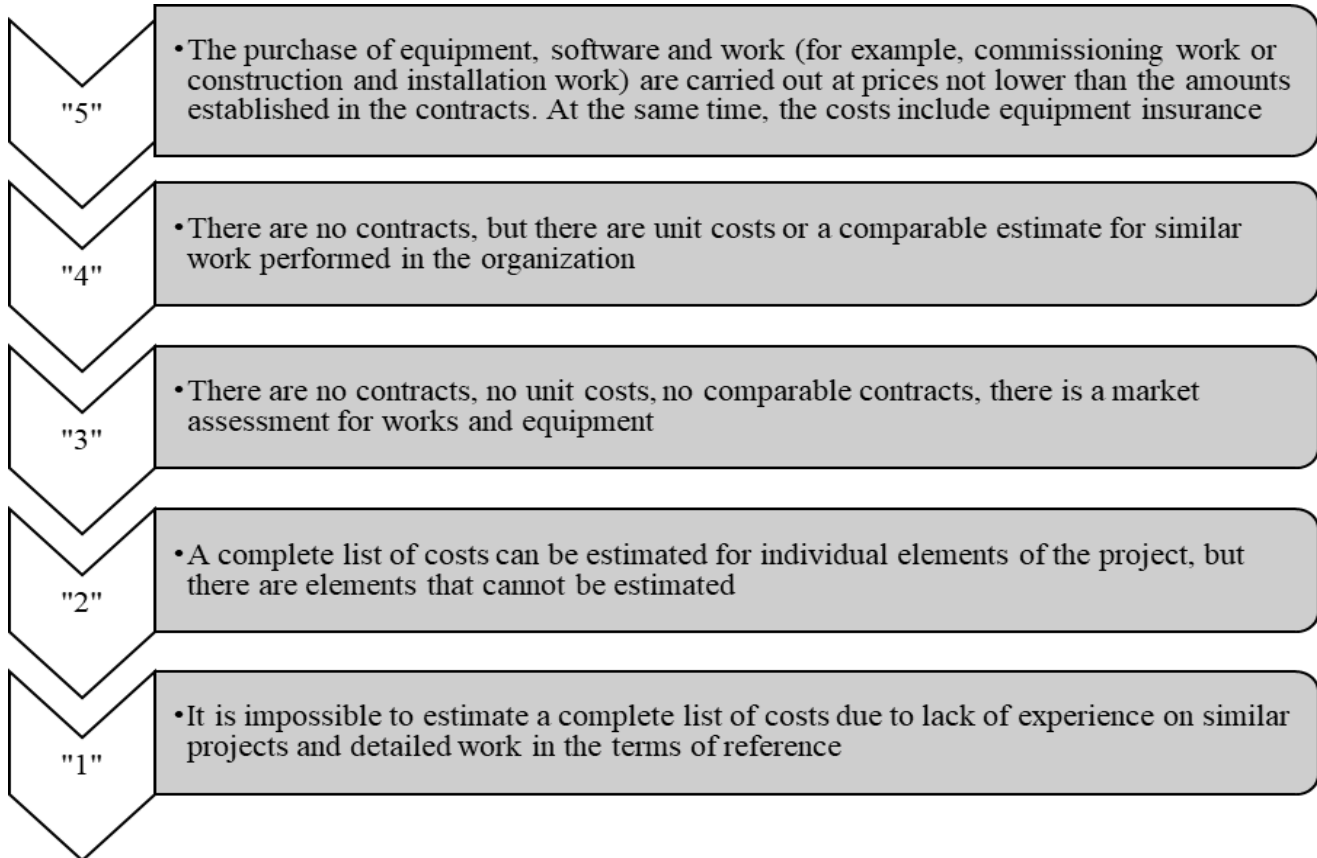


Figure 6. Conditions for scoring according to the risk factor of “irrational use of project costs” for applied projects requiring capital expenditures in excess of the established budget

Source: developed by the authors

In the absence of experience with the project, the organization can analyze and make a forecast of changes in the main technical and economic indicators (including the amount of costs for each event) of the organization from the implementation of this project, in this case the likelihood of the risk of irrational use of costs is noticeably reduced.

The degree of an increase in the likelihood of the occurrence of the risk factor of irrational use of project costs directly depends on the organization's ability to determine the exact cost and amount of all costs both for development and for the execution and support of an applied project at all stages of its life cycle. The risk is considered minimal for the organization in the case when the sum of all possible costs are determined and fixed by contractual obligations. The costs include software, equipment required to create an application project, commissioning, and so on. Moreover, it should be noted that the prices at which the necessary equipment and tools are purchased must not be lower than those specified in the contract. In the case when the contract takes into account not only the minimum costs for the purchase of equipment and components, but also their insurance, as well as the cost of spare parts in case of equipment failure or its modernization.

The risk of not receiving income from the implementation of an applied project directly depends on such components as various sources of income generation. If positive cash flows from the implementation of an applied project are based on fixed guaranteed payments, the amount of which is established by contractual obligations, for example, lease payments, then the above risk is minimal and does not affect the activities of the organization.

The main conditions for assessing the risk of losing income from the execution of applied projects are presented in Figure 7.

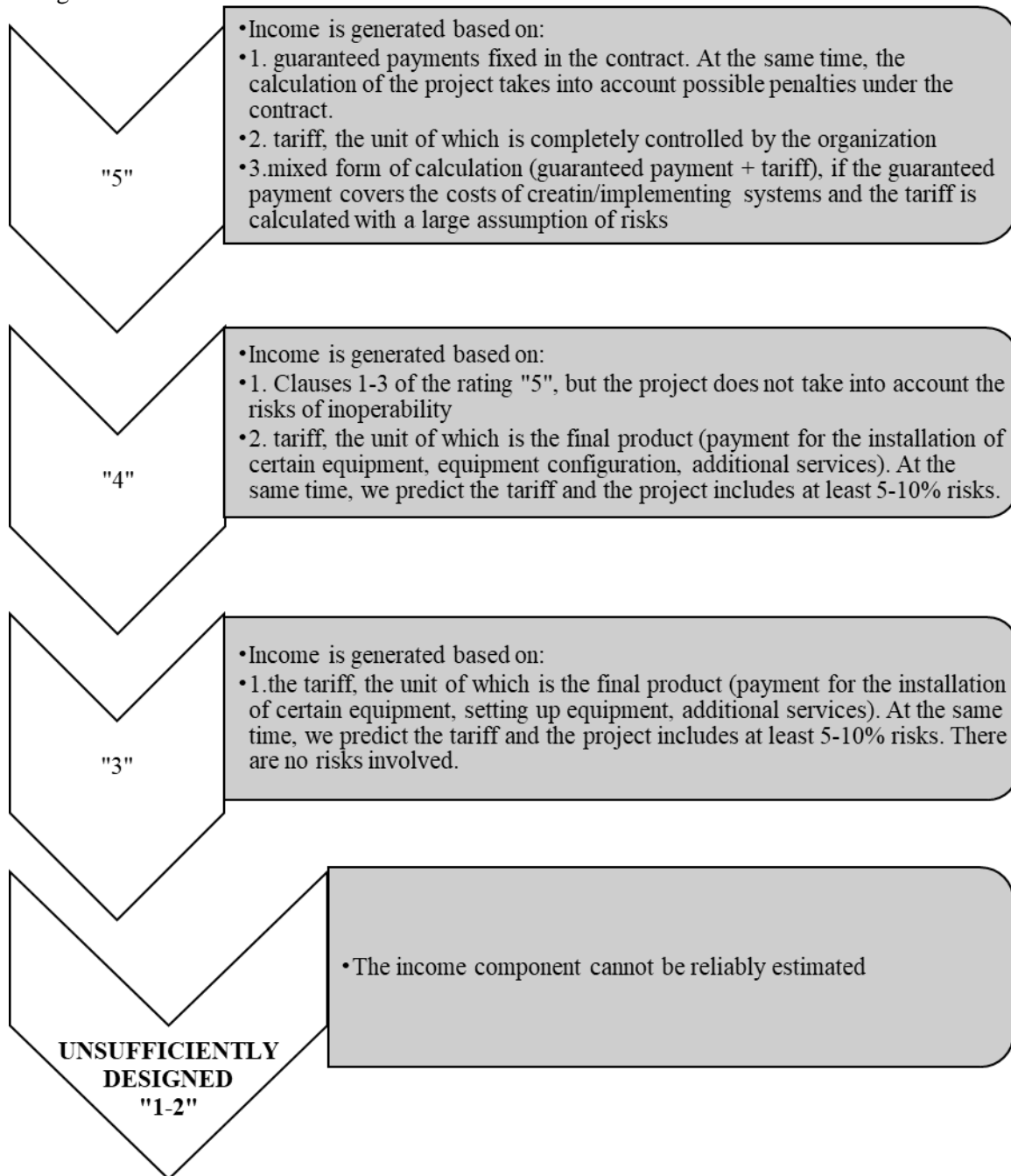


Figure 7. Conditions for scoring the risk factor of "shortfall in income from sales" for applied projects requiring capital expenditures in excess of the established budget

Source: developed by the authors

The likelihood of a negative impact on the organization's activities from the risk of income shortfall increases proportionally with a decrease in confidence in the planned results of work with an applied project (Pakhomov, 2021). The projected profitability indicators of the organization must take into account a certain safety margin, that is, the risks of loss of profitability in an amount that is safe for the further uninterrupted operation of the organization as a whole should be included in the revenue component of the implementation of applied projects. The above-described set of risk factors for application projects that require investment of capital costs in excess of the budget established by the organization is not final and can be changed or supplemented for a specific application project, since their specificity may cause the current models of work to be adapted in accordance with current conditions.

Table 1 presents a model for analyzing and assessing risks for projects requiring capital investments in excess of budget.

Table 1. Model for the analysis of risk factors for applied projects requiring capital investments in excess of the budget established by the organization

Risk factor	The weight	Grade					Total
		1	2	3	4	5	
Low operating profit margins	0,20						
Application project feasibility risk	0,15						
The risk of an increase in the terms of execution of the contract	0,15						
The risk of non-compliance with the established payback period of the project	0,15	-	-				
Risk of misallocation of project costs	0,20						
The risk of receiving less income from sales	0,15	-	-				
Overall project risk assessment							

Source: developed by the authors

Risks that have been identified for application projects requiring capital expenditures in excess of budget are ranked according to the likelihood of their occurrence.

Each risk is assigned a weight coefficient, which indicates the importance and significance of this risk for the project and for the financial stability of the enterprise as a whole. Weighting factors are set individually by organization, depending on the specific features of each analyzed application project.

Table 1 shows examples of the application of weights for various risk factors for applied projects that require capital investments in excess of the established budget.

After receiving the results of the summary risk assessment of the project, the organization's management decides on the possibilities of working on this applied project in the current economic conditions.

4. Analysis and assessment of risk factors for applied projects requiring capital expenditures within the budget of the organization

Risks for application projects requiring on-budget capital expenditures are partially identical to those for over-budget projects. However, it should be noted that the degree of possible emergence of risk factors for this category of projects is less high. (Viola, Rainer, 2021) This is due to the fact that financing of projects is carried out only at the expense of the internal funds of the enterprise and does not require the investment of borrowed funds. Therefore, the risks associated with investing do not have a decisive influence on the development and execution of such projects.

Risks for application projects requiring capital expenditures within the established budget are presented in Figure 8.

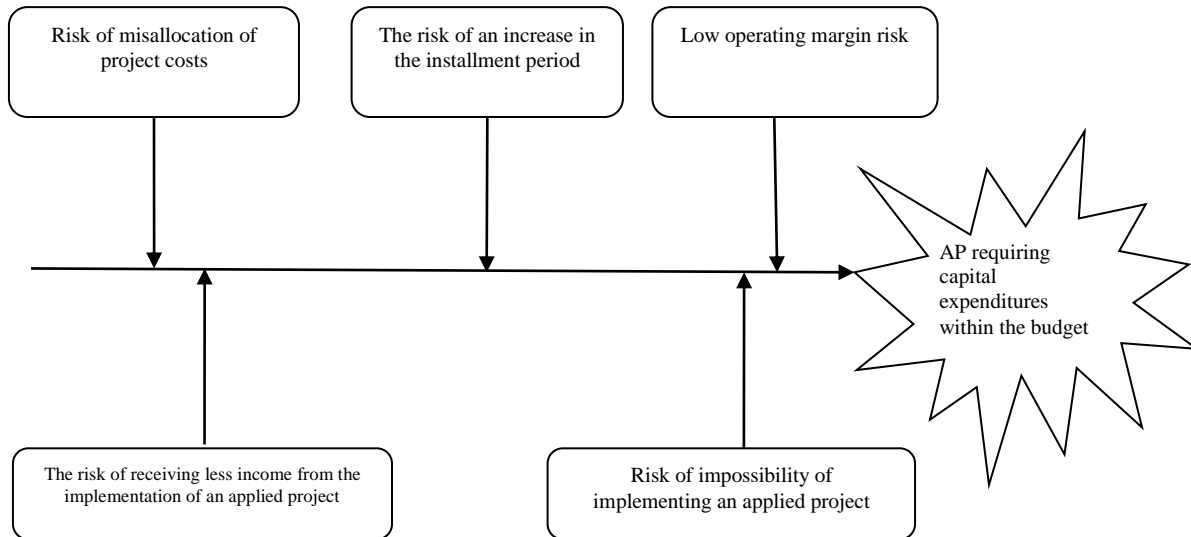


Figure 8. Risks for applied projects requiring capital expenditures within the established budget

Source: developed by the authors

For projects implemented within the budget, the risk of a low level of operating profit, the risk of the impossibility of implementing an applied project, the risk of irrational use of project costs, the risk of not receiving income from the implementation of an applied project coincide with the risks of projects in excess of the established budget.

The risk of an increase in the installment plan period may have an adverse effect both on the developed application project within the budget, and on the forecast technical and economic indicators of the organization as a whole. (Novikova, 2009). Since applied projects requiring capital expenditures are large-scale in nature and their implementation affects the entire work of the organization, any changes from the point of view of creation, maintenance can affect the entire company.

The conditions for scoring the risk factor "increase in the installment plan" for applied projects requiring capital expenditures within the established budget are shown in Figure 9.

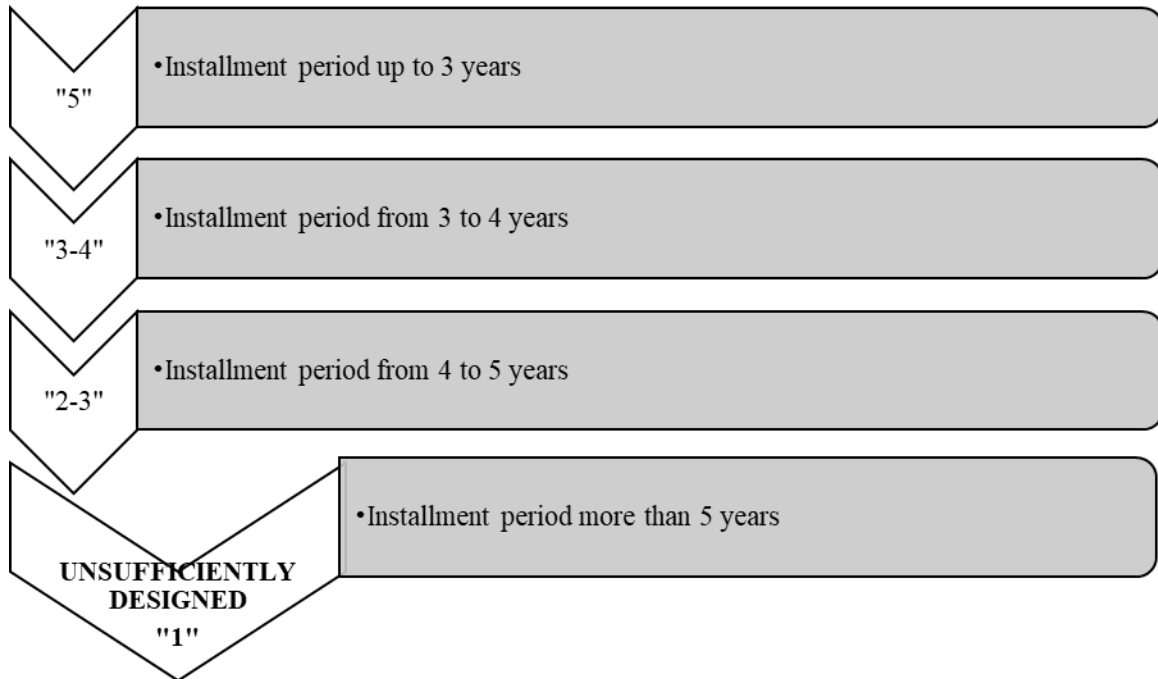


Figure 9. Conditions for scoring the risk factor "increase in the installment plan" for applied projects requiring capital expenditures within the established budget

Source: developed by the authors

If, for the applied project under consideration, the installment period does not exceed 3 years, then the above risk is not critical and does not have a strong impact on the technical and economic indicators. The installment period of more than 5 years does not allow the organization to work with an applied project, since in the long term this risk can become critical and the likelihood of economic losses is very high. In this case, the organization's management may decide to refuse to work with such a project. In accordance with the conditions presented in Figure 9, the risk is considered acceptable when the installment period is from 3 to 5 years.

Table 2 presents a model for analyzing and assessing risks for projects requiring capital investments within the budget established in the organization, within which estimates are given for each value of the applied project.

Table 2. Risk analysis model for applied projects requiring capital expenditures within the budget

Risk factor	The weight	Grade					Total
		1	2	3	4	5	
Low operating profit margins	0,2						
Risk of impossibility of implementing an applied project	0,15						
The risk of an increase in the installment period	0,3	-					
Risk of misallocation of project costs	0,2						
The risk of receiving less income from sales	0,15	-	-				
Overall project risk assessment							

Source: developed by the authors

In the model for the analysis of risk factors for applied projects that require investment of capital costs within the budget, as in the model presented in Table 1, the weighting factors are set based on the specifics of working with a specific applied project.

After calculating risk indicators for applied projects within the budget and having received the primary result of the planned efficiency of work with applied projects, the organization necessarily conducts an additional analysis to confirm the assumptions obtained during this assessment regarding the specific features of working with AP.

5. Analysis and assessment of risk factors for applied projects that require incurring operating costs

Applied projects that require the organization to incur operating costs are not of particular importance for the organization's business as a whole, therefore, the analysis and assessment of risks is carried out after the study of risk factors for applied projects that require capital expenditures for their execution. Operational application projects are coordinated in most cases at the level of the management of the responsible unit, since they only affect the current costs of providing support processes for creating application projects. Such costs can be called ordinary, everyday, not carrying radical changes in the organization's budget.

Risks for application projects requiring operational costs are presented in Figure 10.

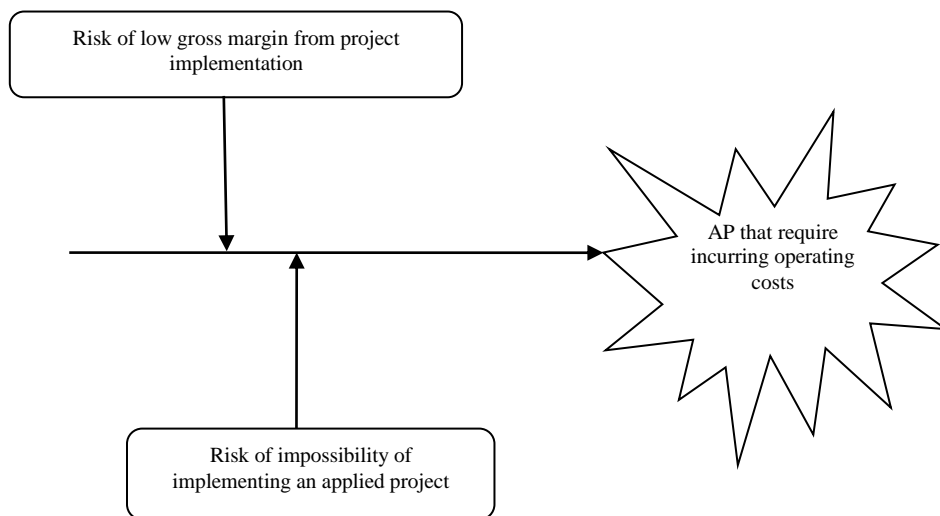


Figure 10. Risks for applied projects requiring operational costs
Source: developed by the authors

One of the risks for operational applied projects is an insufficiently high level of gross margin values from their implementation. The minimum acceptable level of gross margin is set in the organization at regular intervals (Rujoiu, 2019). This threshold value is set by the organization independently and is included in the budget for the billing period, based on the specific features of each developed application project, the internal state of the organization and the external environment. Therefore, other things being equal, a larger gross margin is the most preferable. The higher the actual value of this indicator in comparison with the minimum value, the more profitable and expedient for execution the operational applied project (Sviridenko, 2017). A positive value indicates the stability and sustainability of the financial component of the organization as a whole. When this category of projects has been implemented for more than one year, the planned values for approval in the

organization's budget are also formed under the influence of the average level of gross margin in this sector of the digital economy.

The conditions for assessing the risk factor “low level of gross margin from project implementation” for applied projects requiring incurring operating costs are presented in Figure 11.

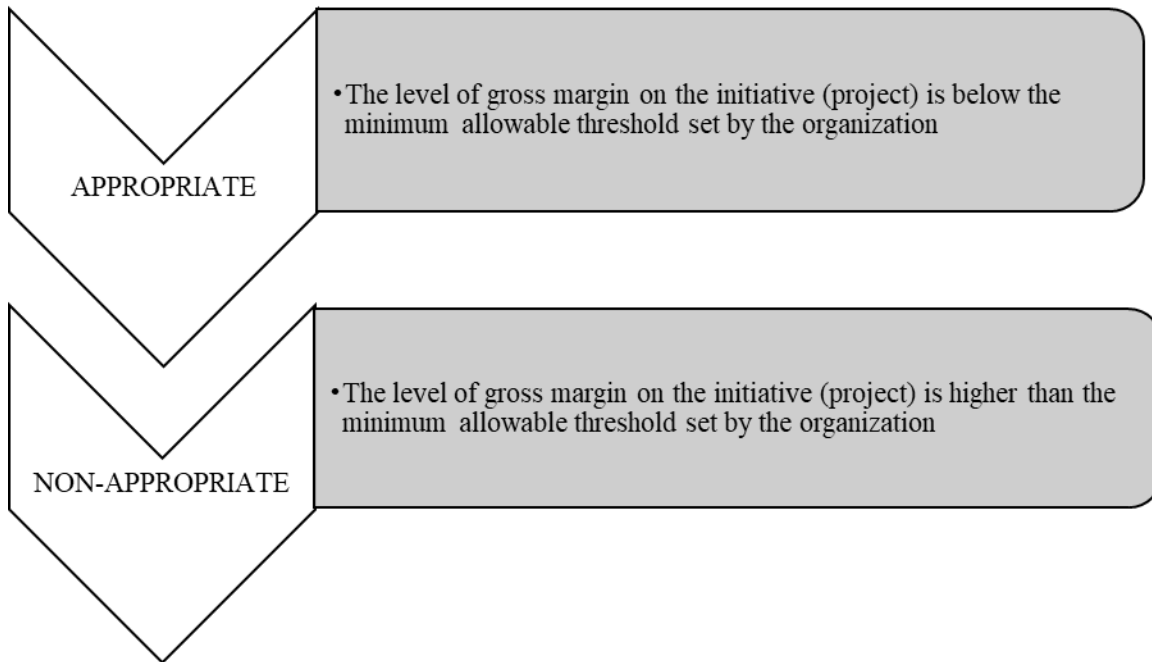


Figure 11. Conditions for scoring the risk factor "low level of gross margin from project implementation" for applied projects that require incurring operating costs

Source: developed by the authors

The risk of the impossibility of executing operational applied projects consists in identifying a number of factors that impede the development of applied projects. This factor is, first of all, the ability of the organization to fulfill all obligations to business partners within the terms established by contractual obligations. If the project cannot be fully implemented or there are difficulties in implementation and the terms of practical implementation increase, then the risk of impossibility of implementation may become critical. In case of significant values of the risk of impracticability, it is advisable to completely abandon this project or send it for revision and re-examination of the revised terms of reference for assessing this risk.

The conditions for scoring the risk factor "impossibility of implementing an applied project" for applied projects requiring incurring operating costs are shown in Figure 12.

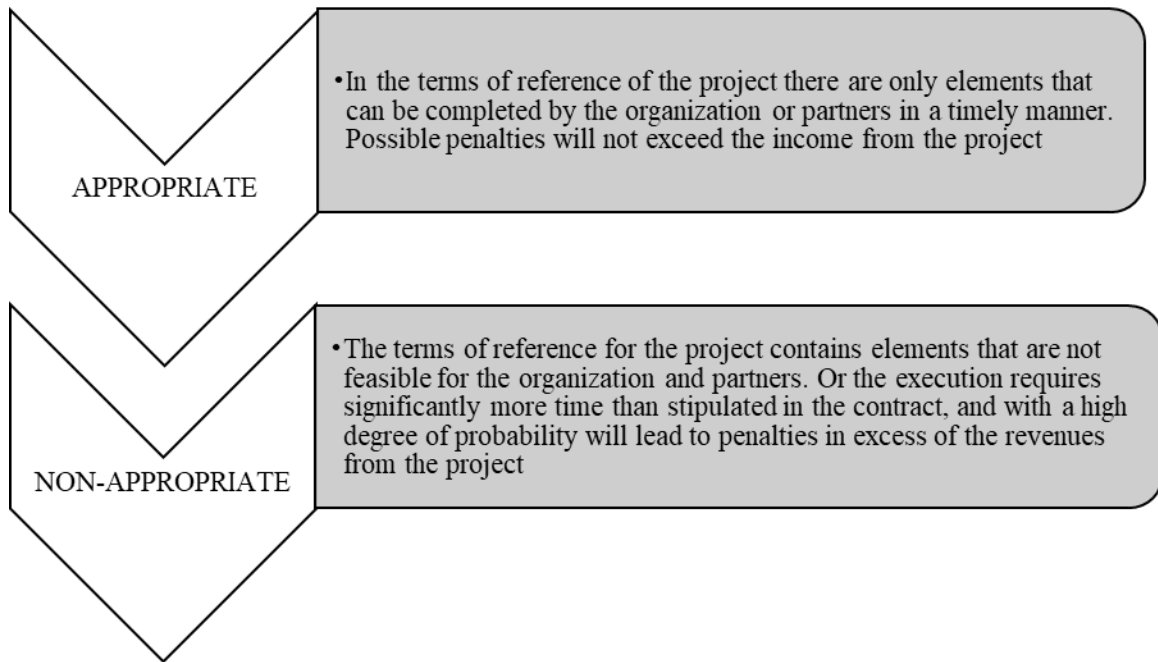


Figure 12. Conditions for scoring the risk factor "impossibility of implementing an applied project" for applied projects that require incurring operating costs
Source: developed by the authors

In the case when the prolongation of the terms is the reason for the imposition of fines or sanctions in the direction of the organization developing the applied project, it is necessary to conduct an analysis and comparative assessment of the compliance of the forecast profitability and possible penalties. The risk can be considered insignificant if the income exceeds the possible economic loss.

Table 3 presents a model for analyzing and assessing risks for projects that require an investment of operating costs.

Table 3. Model for the analysis of risk factors for applied projects that require incurring operating costs

Risk factor	Grade	
Risk of low gross margin from project implementation	Gross margin level does not match NON-APPROPRIATE	The gross margin level corresponds to APPROPRIATE
Risks of impossibility of implementing an applied project	The risk is high NON-APPROPRIATE	Medium to low risk APPROPRIATE

Source: developed by the authors

The risk analysis model presented above does not take into account the weights of factors for the assessment, since both risk data are, on an equal basis, the most decisive for determining the feasibility of implementing a project. As in the models designed for projects requiring capital investment, the presence of at least one risk with a critical value for an operational project indicates the need to abandon implementation.

6. Practical implementation of the proposed methodology for the Smart City applied project

The applied project, which was selected as the object of research, is being implemented by an organization operating in the telecommunications industry - the Applied project "Smart City", including Electronic Government" (hereinafter referred to as the "Smart City") of PJSC Rostelecom.

PJSC "Rostelecom" is actively pursuing the development of applied projects within the telecommunications industry as part of its strategy. PJSC Rostelecom is implementing the development of Smart Cities, which include

a set of smart solutions that allow a city to be called “smart”. The Smart City project includes various systems for monitoring, analysis, forecasting, and management of almost all types of risks and possible threats typical of a particular city and urban infrastructure (Taburchak, Bychkova, Butina, 2019). As an example of innovative solutions as part of this project, one can single out "Video surveillance", "Smart intercom", "Digital accounting of utilities", "Smart barrier", "Smart home", "Safe roads", "Warning systems", "Electronic education ", " Smart lighting ", etc.

Applying the classification of applied projects described in clause 1.1 of this study, the “Smart City” applied project of PJSC “Rostelecom” can be classified as applied projects requiring capital expenditures for development and implementation in excess of the established budget.

The risk factors analysis model for the Smart City applied project is presented in Table 4.

Table 4. Model of analysis of risk factors for the applied project "Smart City"

Risk factor	The weight	Grade					Total
		1	2	3	4	5	
Low operating profit margins	0,20			3 (5,49%)			0,6
Application project feasibility risk	0,15					5 (yes)	0,75
The risk of an increase in the terms of execution of the contract	0,15					5 (yes)	0,75
The risk of non-compliance with the established payback period of the project	0,15	-	-		4 (4,33 years)		0,6
Risk of misallocation of project costs	0,20					5 (yes)	1
The risk of receiving less income from sales	0,15	-	-			5 (yes)	0,75
Overall project risk assessment							4,45

Source: developed by the authors

The total risk assessment for an applied project can vary in the range from 1 to 5. The results of the construction of the above model are based on the statistical reports of PJSC Rostelecom for 2020.

In general, the value of the total assessment of the risk factors of the “Smart City” project was 4.45 points. This means that the risks are for the most part not critical from the point of view of their possible appearance and the strength of the impact both directly on the applied project itself and on the activities of the organization. The materiality of the risks was determined based on the weighting factors for each risk factor. The risk of a low operating profit margin has the most negative impact on the development and execution of the selected applied project. For the “Smart City” applied project, the value of this factor was estimated at 3. As a recommendation for leveling the above risk, one can single out the need to build rational forecasts for obtaining positive cash flows. Another risk that may subsequently become tangible for the organization was the risk of non-compliance with the established payback periods of applied projects in excess of the established budget. At the time of the calculations, the payback period for the “Smart City” applied project was 4.33 years. From the point of view of business processes, such a payback period is acceptable for any organization. However, this project is being implemented in the context of the development of the digital economy, therefore, the uncertainty and risk of occurrence increase significantly in proportion to the increase in the duration of this applied project. The rest of the risks at the time of the calculations do not affect the organization, which does not mean that one should not ignore their ability to force the current and forecast performance indicators of this applied project to be adjusted.

This applied project is significant for business and society as a whole, as it contributes to the development of informatization and digitalization, therefore, the feasibility of implementing the project is beyond doubt.

Conclusions

Within the framework of the execution of applied projects, various categories can be distinguished, depending on the costs incurred by the organization. Each category of applied projects has specific risks that, to a greater or lesser extent, restrict an enterprise's ability to implement projects. Prioritization of applied projects is required, taking into account the applicable risk factors by type of applied project (Karen Elliott et al., 2021). There are also risk values that, at the stage of evaluating applied projects, can unambiguously signal the inexpediency of considering the possibility of implementing applied projects in the existing form without any changes. (Buteau, Sharon, Rao, Preethi, Valenti, Fabrizio, 2021).

A methodology for analyzing and assessing risks by types of applied projects has been developed. Depending on the type of applied project, the set of risk factors changes, since the larger the scale of a particular project, the larger the horizon for analysis and planning of development and implementation, the higher the likelihood of risk occurrence (Pan'shin, 2016). For each type of applied project, a set of universal risk factors is proposed that can be adapted to the needs of a particular firm. By analyzing these factors, the organization receives operational information regarding the threats and difficulties in the implementation of applied projects from the market and the digital economy as a whole.

The developed methodology for analyzing the risks arising for an organization during the execution of applied projects makes it possible to analyze, rank and identify the risk factors of the digital economy that most affect the organization's activities. In this case, it is necessary to take into account the importance of each factor for the financial condition of the company.

Despite the relevance and obvious advantages of the proposed methodology for analyzing and assessing the risk factors of various types of applied projects, it should be noted the limitations that can affect the work with projects in general. As such restrictions, one can single out a high probability of changes in environmental conditions and the need for prompt adaptation of existing analytical mechanisms. You should also pay attention to the significant speed of improvement of technologies and tools for analyzing applied projects. All of these limitations and difficulties contribute to motivating and energizing organizations when working with innovative products such as applied projects.

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Data Availability Statement: All data is provided in full in the results section of this paper.

Author Contributions: Conceptualization: Alexey Petrovich TABURCHAK, Svetlana Mikhailovna BYCHKOVA, Alina Alexandrovna BUTINA; methodology: Alexey Petrovich TABURCHAK, Svetlana Mikhailovna BYCHKOVA, Alina Alexandrovna BUTINA; data analysis: Alexey Petrovich TABURCHAK, Svetlana Mikhailovna BYCHKOVA, Alina Alexandrovna BUTINA, writing—original draft preparation: Alexey Petrovich TABURCHAK, Svetlana Mikhailovna BYCHKOVA, Alina Alexandrovna BUTINA, writing; review and editing: Alexey Petrovich TABURCHAK, Svetlana Mikhailovna BYCHKOVA, Alina Alexandrovna BUTINA; visualization: Alexey Petrovich TABURCHAK, Svetlana Mikhailovna BYCHKOVA, Alina Alexandrovna BUTINA. All authors have read and agreed to the published version of the manuscript.

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