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Project Performance Management in Enterprises in Industry 5.0

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ABSTRACT

The article systematizes the understanding of the development and implementation of project activities in the context of Industry 5.0. It is noted that with the development of Industry 5.0, the management of enterprise project activities becomes of paramount importance. The key driver of this process was the COVID-19 pandemic. The aim of the article is to develop a project to enhance the efficiency of project activities for enterprises in the conditions of Industry 5.0. To achieve this goal, it is proposed to identify 7 stages for improving the efficiency of project activities for enterprises. The proposal includes defining alternative goals, establishing criteria for selecting responsible project performers, conscientiously forming the project team, and comprehensively analyzing strategic and current issues. This will help identify the sources of their occurrence and factors influencing them. As a result, the strategic goal will be correctly defined, and the main directions for improving the efficiency of enterprise activities will be substantiated. To enhance the efficiency of project activities for enterprises in the conditions of Industry 5.0, a combination of three measures is proposed: improving the quality of professional training, improving the financial condition of the enterprise, and enhancing the production status of the enterprise.

KEYWORDS: project activity, Industry 5.0, Covid-19, management, sustainable development.
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1 Introduction. With the development of Industry 5.0, the issues of project management within enterprises become increasingly crucial. The relevance is heightened by the fact that Industry 5.0 emerged in Ukraine approximately two years ago. The key driver of this was the COVID-19 pandemic. In the business environment, questions arise regarding full alignment with the green course, leading to sustainability and a circular economy. Processes aimed at improving the resilience of value chains and ecosystems to new shocks (pandemics, natural disasters, wars) are also observed. The activities of most enterprises should focus on sustainability, resilience, digitization, human-centric approaches, and corporate responsibility. Currently, there is a shift in the philosophy of understanding business, where the frameworks for development are defined by competitiveness and sustainability. Industry 5.0 seeks to integrate human capabilities, advanced technologies, and environmental care. In project activities, more attention should be given to human, social, and environmental aspects. It becomes evident that to achieve the goals of Industry 5.0, it is necessary not only to commercialize innovative products and technologies but also to establish a sustainable value system. The latter undergoes transformation through effective management approaches. Therefore, the search for development prospects and revenue generation is the foundation of project activity in the modern economy. It is characterized by dynamism and uncertainty, requiring economic entities to take adaptive actions to achieve entrepreneurial goals without posing threats to societal development and the environment. The essence of project management lies in assembling a team of highly qualified professionals from various fields to execute a complex project within set deadlines, ensuring a specified level of quality and utilizing allocated material, financial, and labor resources for this purpose. Project management aims to optimize the flow of financial and monetary resources, as well as effectively address challenges that arise between economic entities during project implementation. Thus, a balance of interests among different stakeholders in Industry 5.0 is sought: government, business, and society.

2 Literature Review. The research of authors on project management becomes of paramount importance. Moreover, such studies are deepened in the context of COVID-19 and the challenges of Industry 5.0. Zadorozhna&Kepko(2021)concluded that quality assessment, by its essence, is a project activity. It exhibits all the features of a project approach. Specifically, it involves a clearly defined purpose of activity, uniqueness of the obtained result, engagement of the project team in project work, and the existence of certain constraints that determine the specifics of implementing a particular project evaluation. The authors consider that the quality assessment project algorithm consists of two parts: the development of the quality assessment methodology and its application. They equate the modern economy with the project economy.

Maistrenko(2021) noted that project management in a rapidly changing environment is a relevant technology that ensures the effective solution of a specific set of tasks within limited time frames and with minimal costs. Project management significantly improves productivity and enhances efficiency. The success of applying project management depends on its professional implementation in a specific institution and the effective organization of teamwork. It greatly enhances productivity and increases the efficiency of enterprise activities.

Obidiennova et al (2020)explored the issue of enterprise management. It is based on considering the enterprise as a set of resources that participate in achieving the set goal. On the other hand, it is viewed as a set of functions that need to be implemented to achieve the desired result. Depending on the characteristics of the enterprise's functioning, project goals, project tasks, and available resources, the following options are possible when forming a project management team: Option 1: All members of the project team are employees of the same enterprise within which the project team is created. Option 2: All members of the project team are invited experts from other enterprises and organizations. Option 3: Some experts are employees of the enterprise, and experts whose knowledge and skills require modern approaches to project task execution are invited from other enterprises and organizations. The authors consider the third option to be the most preferable as its advantages outweigh the drawbacks associated with its use.

Samoilenko(2022). identifies several optimal ways to successfully implement project activities in the enterprise. One of them is partnership, which creates social capital, improves mutual understanding, trust, and interaction among representatives of different community sectors. This is the most effective form of relations between various community institutions, helping overcome the consequences of negative changes..

Nahara(2022)researched Industry 5.0, which comprises three main elements: human-centricity, stability, and resilience. The rapid spread of Industry 5.0 technologies is driven by the formation of effective business models based on intellectualization, socialization, and ecological considerations. In the perspective of the global economic system of Industry 5.0, a new type of business models will emerge, grounded in knowledge, innovation, and information, with an orientation towards diversified values in line with sustainable development goals.

Chernenko et al. (2022) emphasize that cloud computing plays a crucial role in the further development of the Fourth Industrial Revolution in the context of the "Fifth Industry". Cloud computing consolidates, centralizes, and processes information beneficial for businesses. The Fifth Industrial Revolution will transform the business of individual enterprises and impact the redistribution of productive forces on a global scale. A characteristic feature of Industry 5.0 is a human-centric approach to the development and implementation of technologies. They enable the assessment of the level of enterprise savings in the use of natural resources, social responsibility, the level of emissions of pollutants into the external environment, the number of new jobs created, and compliance with gender equality.

Zubkova et al.(2023)note that during Industry 5.0, a system of strategic risks for enterprises is being formed. This occurs during the implementation of digitization projects. Eight classes of such risks are described: technological risks, competitiveness risks, operational risks, stakeholder relationship risks, financial risks, human resources risks, brand risks, and hybrid attack risks.

Chernikov&Gryshko(2023)pointed out that Industry 5.0 enables enterprises and industries to actively provide solutions to society for resource conservation, ensuring social stability, and addressing climate goals. However, there is a very high probability of new risks emerging that negatively impact

various aspects within organizations. Industry 4.0 and Industry 5.0 will not be able to fully realize their potential until all their risks are well understood and clearly assessed .

Polinkevych (2020) ; Polinkevych & Kolosok (2022); Polinkevych et al. (2023)noted that in Industry 5.0, socially responsible business plays a crucial role. They identify the features of business and project activities in Ukraine during the period of war and the COVID-19 pandemic.

3 Methodology. In this work, a comprehensive descriptive approach, analytical methods, synthesis, abstraction, and comparison are employed in investigating project activities of enterprises in the context of Industry 5.0. The study utilizes the method of generalization in examining the stages of development and implementation of a project aimed at improving the efficiency of enterprise project activities. Additionally, a graphical method is applied to determine cause-and-effect relationships and the "goals - measures - resources" graph of the efficiency enhancement project for enterprise project activities. The tabular method is employed to identify strategic and current issues related to improving the efficiency of enterprise project activities, listing strategic and current goals, and proposing alternative implementation options for the efficiency enhancement project for enterprise project activities.

4 Results. Conceptual approaches division into periods

The aim of the article is to develop a project aimed at improving the efficiency of project activities in the conditions of Industry 5.0.

In the context of integrating domestic enterprises into the global economic space, accompanied by intensified competition, stimulation of specific markets, and challenges in achieving technological breakthroughs, including working with current and potential customers. The identification and systematic implementation of strategies to enhance the efficiency of project activities for enterprises in the context of Industry 5.0 are essential prerequisites for improving overall business performance.

The development and implementation of a project to enhance the efficiency of project activities at the enterprise in the context of Industry 5.0 form the basis of the proposed methodological support. This project is advisable to be carried out through the following stages:

1. Formulation of the project goal: The goal should be clear, measurable, achievable, relevant, and timely.

2. Development of criteria for selecting responsible project performers: Criteria should define the necessary knowledge, skills, and experience required for the successful execution of the project.

3. Selection and appointment of responsible performers in project formation: Responsible performers should possess the necessary knowledge, skills, and experience for the successful execution of the project.

4. Identification of strategic and current issues in improving the efficiency of the project activities at the enterprise: Issues may be related to financial management, operational activities, marketing, or other aspects of enterprise operations.

5. Conducting a comprehensive analysis of strategic and current issues in improving the efficiency of project activities at the enterprise: This analysis aims to identify the sources of problems and influencing factors.

6. Definition of strategic goals and their structuring: Strategic goals should be clear and measurable, defining the desired outcome from the project's implementation.

7. Justification of the main directions for improving the efficiency of enterprise activities: The directions for improvement should be aimed at addressing identified problems, realistic, and achievable.

At the initial stage of developing a project to enhance the efficiency of project activities at the enterprise, it is necessary to define alternative goals that can be set within this project. These goals may include:

1. Maximization of consumption levels: This implies that the enterprise aims to increase the sales volume of its products.

2. Maximization of consumer satisfaction: This means that the enterprise strives to produce goods that best meet consumer needs.

3. Maximization of choice: The enterprise aims to offer consumers a wide range of goods.

4. Maximization of quality of life: The enterprise aims to ensure the availability of goods at affordable prices and high quality.

At the second stage of developing a project to enhance the efficiency of project activities at the enterprise, it is necessary to develop a list of criteria for selecting responsible project performers. The role of the project manager is of particular importance during this stage.

According to existing opinions of researchers and current project management standards, the professional skills of a project manager should encompass the following aspects:

1. Project mission structuring and task listing: the project manager must have a clear understanding of what needs to be achieved within the project. They should be able to identify the key tasks of the project and distribute them among the team members.

2. Ensuring project goals are attained within specific constraints: the project manager should be adept at planning the project, taking into account available resources and constraints. They need to coordinate the work of team members and monitor project execution.

3. Achieving comprehensive stakeholder satisfaction: the project manager should be skilled at establishing effective collaboration with all project stakeholders. They must be capable of resolving conflicts of interest among different parties.

The project team also holds significant importance. Its members should possess skills, knowledge, and experience in applying specific research methodologies, high qualifications in their respective fields, the ability to optimize resource utilization and business processes, a certain speed of project implementation, the capacity for effective innovative collaboration within a team, responsibility for task execution according to the project schedule and operational procedures, time management skills, budget control capabilities, and the ability to assess the overall progress of the project and each participant individually. The project team can be composed of representatives from legal entities as well as individuals.

When selecting responsible project performers, it is essential to consider organizations' reputation in the market of research services, the quality of provided services, direct experience and qualifications of employees, parameters of the interviewer network for conducting quantitative surveys, the availability of special software and technical tools for organizing focus groups, promoting the company's products online, and collecting relevant statistical information. Additionally, the consideration of a comprehensive approach to addressing client needs and the ability to provide additional services is crucial.

At the third stage of project development aimed at enhancing the enterprise's operational efficiency, the project team is formed. This stage involves the selection and appointment of responsible project performers.

For most enterprises in Industry 5.0, the most reasonable methods of forming a project team involve goal-oriented or problem-oriented approaches, facilitating the quickest and most effective achievement of project objectives.

At the fourth stage, the identification of strategic and current issues related to enhancing the efficiency of project activities within the enterprise takes place. This stage involves conducting a comprehensive analysis of the enterprise's operations to identify the sources of problems and influential factors.

Table 1 provides a list of strategic and current issues related to improving the efficiency of enterprise activities. While this list identifies the key problems, it does not provide a complete understanding of their essence, the reasons for their occurrence, their interrelation with others, and possible directions for their resolution. This information is available only to executives at a certain level who have access to comprehensive information about the enterprise's operations.

Table 1. *Strategic and current challenges in enhancing the efficiency of project activities in the industry 5.0 environment.*

Problem	Problem code
The enterprise lacks a clear vision of how it wan	1
There are no clear goals and directions for improving efficiency	2
There is no action plan	3
Insufficient coordination of various activities	4
Insufficient quality of project management personnel	5
Insufficient assessment of the strengths and weaknesses of the enterprise, market opportunities, and threats	6
Inadequate identification of alternative implementation options for the directions of the project activities of the enterprise	7
Absence of a methodology for assessing the effectiveness of project activities at the enterprise	8

Absence of analysis and subsequent improvement of relationships and interactions with the external environment	9
Lack of clear delineation of responsibilities among all structural units of the enterprise involved in implementing projects to enhance the efficiency of project activities	10
Imperfections in the legislation regulating issues such as demand, supply, monopoly, and export-import activities	11
The level of use of modern technologies is low	12
Insufficient level of research efficiency	13
Insufficient level of information system efficiency	14
The effectiveness level of target market segmentation is weak	15
The effectiveness level of direct sales is weak	16
The level of effectiveness in stimulating product sales is insufficient	17
Weak positions in the effectiveness of the company's product policy	18
Weak positions in the effectiveness of the company's sales policy	19
Weak positions in the effectiveness of public opinion formation	20
Weak positions in the effectiveness of advertising activities of the enterprise	21
Weak positions in the effectiveness of the enterprise's brand application	22
The company lacks a mechanism to ensure the safety and efficiency of technology use	23
Unstable state of infrastructure	24
Insufficient efficiency in implementing innovative products	25
The level of acquisition of new technologies, research, and development is low	26
The level of quality of workforce training is low	27
The level of improvement in the efficiency of project activities at the enterprise, according to an objective assessment, is low	28
The level of improvement in the efficiency of project activities at the enterprise, according to a subjective assessment, is low	29
The overall level of improvement in the efficiency of project activities at the enterprise, is low	30

Noted. Summarized by the author

To address the issues, it is essential to understand their interconnections. The identified problems may be interconnected, where one problem can be the cause of another. For instance, legislative imperfections may lead to an increase in monopolies, and monopolies, in turn, may contribute to the rise of corruption. Analyzing the interrelationships among problems will help identify primary issues and those that are consequences of others. This, in turn, aids in developing an effective problem-solving plan.

For example, if legislative imperfections are the primary issue, the priority task is amending the legislation. Once the legislation is improved, it becomes possible to address other problems that result from legislative imperfections. This is illustrated in Figure 1.

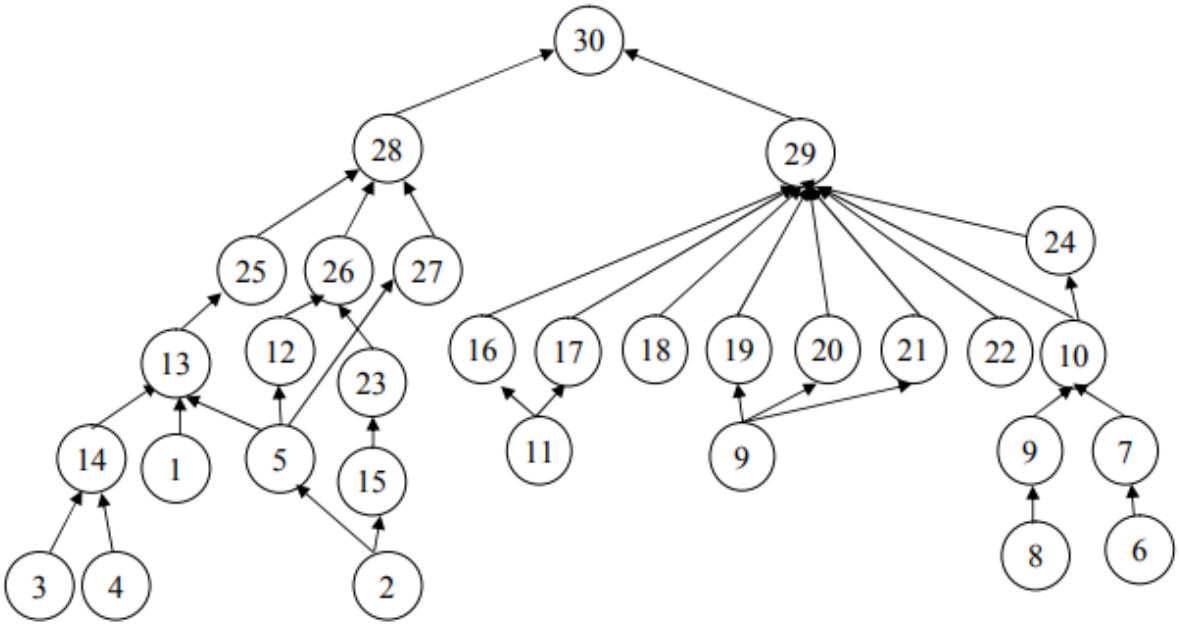

Figure 1. *Approximate graph of causal relationships*

Noted.Summarized by the author

Goals are structured from general to specific. First, a general goal is formulated, which is the basis for forming sub-goals. Sub-goals, in turn, can be broken down into smaller sub-goals. This process continues until all goals are sufficiently detailed for their implementation. It is important that each higher-level goal be represented in the form of sub-goals of the next level. This ensures the completeness of the goal structure and allows you to understand how they are interrelated. The formed list of strategic and current goals is presented in Table 2.

Table 2*. List of strategic and current goals*

trategic and current goals	Goal codes
Improving the overall effectiveness of project activities	0.1
Improving the objective effectiveness of project activities of an enterprise	1.1
Improving the subjective effectiveness of project activities of an enterprise	1.2
Improving the quality of human resources training	2.1
Improving innovative activity	2.2
Strengthening the financial condition of an enterprise	2.3
Strengthening the production condition of an enterprise	2.4
Improving the effectiveness of a company's brand	2.5
Improving the state of financial infrastructure	2.6

Improving the efficiency of using modern technologies	2.7
Forming a technology audit mechanism	2.8
Improving a enterprise's action plan	2.9
Improving the efficiency of project activities at an enterprise	2.10
Improvement of information and communication support	2.11
Improved accountability between all structural units of the enterprise that participate in the implementation of projects to improve the efficiency of the enterprise's activities	2.12

Noted.Summarized by the author

It is useful to compare goals by two criteria for goal structuring: 1) necessity: is the goal necessary to achieve the overall goal? 2) general – partial: is the goal part of the overall goal? This comparison will help: 1) identify the content of goals: understand what needs to be done to achieve the overall goal; 2) formulate goals: formulate goals in such a way that they are understandable, achievable and realistic (Fig. 2).

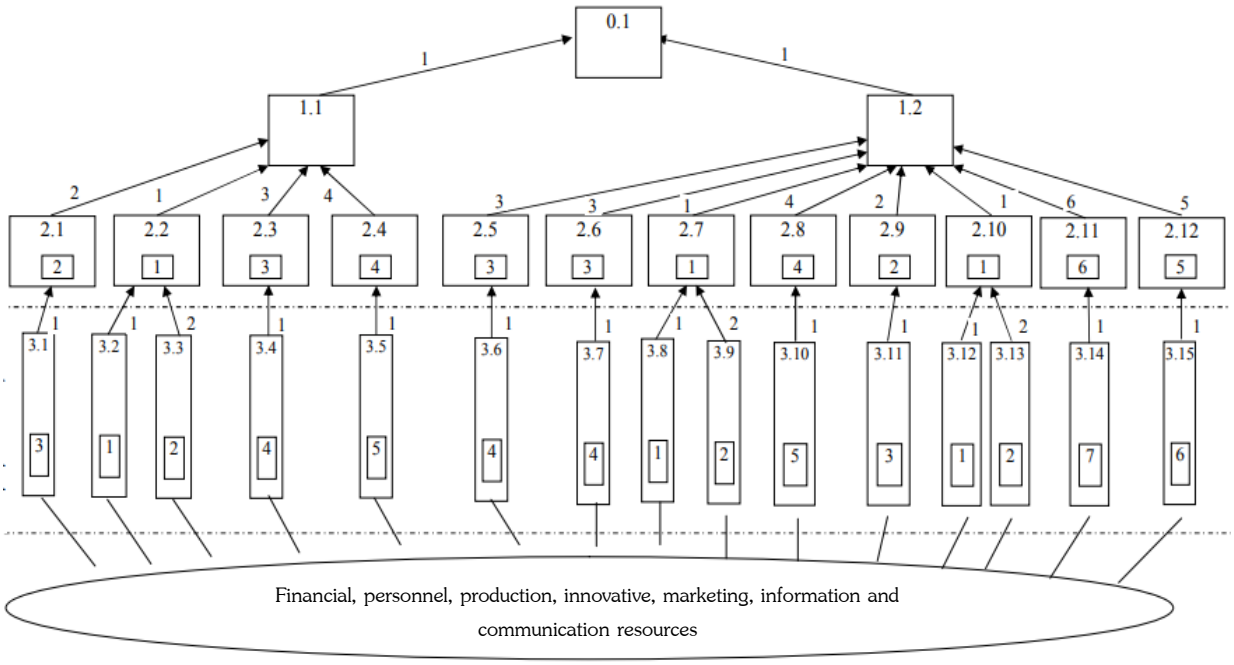

Figure 2. *Goals – Measures – Resources graph for the project to improve the efficiency of project activities at an enterprise in the conditions of Industry 5.0*

Noted. Summarized by the author

Analysis of Figure 2 shows that to achieve the main goal **(0.1)**, it is necessary to achieve two first-level goals **(1.1** and **1.2).** These goals are equally important, so they have the same rank.

Building a goals-measures-resources graph allows you to plan not individual measures, but their interdependence. This allows you to move from planning goals and measures to planning the resources needed to implement them.

The next stage in the development and implementation of projects to improve the efficiency of project activities at an enterprise in the conditions of Industry 5.0 is the formation of alternative ways to achieve the set goals.

Measures to improve the quality of professional training of personnel (MP)

MP 1.1. Signing of agreements with leading universities, institutes, and other organizations for professional development. This measure is aimed at improving the qualification of the enterprise's employees through training at leading educational institutions and organizations. This will help employees acquire new knowledge and skills that will be necessary for effective work.

MP 1.2. Conducting in-house trainings to acquire the latest competencies. This measure is aimed at improving the qualification of the enterprise's employees through conducting in-house trainings. This will help employees acquire new knowledge and skills that will be necessary to solve specific tasks facing the enterprise.

MP 1.3. Development of a motivation system for professional self-development for each employee at the enterprise. This measure is aimed at increasing employee motivation for professional self-development. This can be achieved by providing employees with financial and non-financial incentives to learn.

Measures to improve the financial condition of the enterprise (MF):

MF 1.1. Improvement of the enterprise's accounts receivable policy regarding the adaptation of payment terms. This measure is aimed at reducing the enterprise's accounts receivable. This can be achieved by establishing stricter payment terms for supplied goods and services.

MF 1.2. Improving the enterprise's accounts payable policy. This measure is aimed at extending the payment terms for received goods and services. This can be achieved by negotiating with suppliers.

MF 1.3. Improving the enterprise's depreciation policy. This measure is aimed at reducing the tax burden on the enterprise. This can be achieved by establishing longer depreciation periods for fixed assets.

Measures to improve the production state of the enterprise (MPS):

MPS 1.1. Acquisition of new equipment by the enterprise for technological operations related to key business processes. This measure is aimed at upgrading the production equipment of the enterprise. It can help the enterprise increase labor productivity, as well as the quality of products and services.

MPS 1.2. Renovation of existing equipment at the enterprise. This measure is aimed at repairing and upgrading the existing production equipment. It can help the enterprise extend the service life of the equipment and enhance its efficiency.

Measures to improve business communications in project activities (MBC):

MBC 1.1. Develop a business communication policy that outlines the principles and rules of effective communication in project activities. The first step towards effective communication is establishing clear goals and expectations for the project. This helps all stakeholders understand what is expected of them and avoids misunderstandings. Provide all project stakeholders with access to necessary information. It is essential to choose communication channels that best suit the needs of the specific project. Possible communication channels include face-to-face meetings, phone calls, email, web conferences, and social media. Organize regular meetings and discussions to exchange information and address issues. This helps prevent delays and errors.

MBC 1.2. Implement a reporting and training system that allows tracking project progress and identifying potential issues. Business communication is more effective when there is a culture of openness and trust among all project stakeholders. Encourage open dialogue and the exchange of ideas.

The next stage involves developing alternative scenarios for project implementation. Each scenario is based on one of the alternative measures. Table 3 presents several scenarios for implementing the project to enhance the efficiency of the enterprise's project activities.

***Table 3**. Alternative implementation options for the project to improve the efficiency of the enterprise's project activities in Industry 5.0.*

Project variant	Project activities
1	MP 1.1. MF 1.1. MPS 1.1. MBC 1.1.
2	MP 1.2. MF 1.2. MPS 1.2. MBC 1.2.
3	MP 1.3. MF 1.3. MPS 1.1. MBC 1.1.
4	MP 1.2. MF 1.1. MPS 1.2. MBC 1.2.
5	MP 1.3. MF 1.1. MPS 1.1. MBC 1.1.
6	MP 1.2. MF 1.2. MPS 1.1. MBC 1.1.
7	MP 1.3. MF 1.3. MPS 1.1. MBC 1.1.
8	MP 1.3. MF 1.3. MPS 1.2. MBC 1.2.

Noted. Summarized by the author

It is worth choosing one of the project options in which the measures from the proposed list should be implemented. Such an option can significantly improve the level of efficiency of the enterprise's project activities.

8 Discussion. With the development of Industry 5.0, the importance of project management for enterprises is becoming increasingly important. The consequences of the COVID-19 pandemic have contributed to the implementation of these processes. The activities of most enterprises in the context of Industry 5.0 are based on sustainability, digitalization, human-centeredness, and corporate responsibility. Here, a balance of interests between government, business, and society must be achieved. It is noted that the development and implementation of a project to improve the efficiency of an enterprise's financial performance includes seven stages:

1. Formulation of the project goal. The project goal must be clear, understandable, and achievable.

2. Identification of responsible performers. Responsible performers must have the necessary knowledge and experience to implement the project.

3. Selection and appointment of responsible performers. Responsible performers should be selected based on developed criteria. The selection of a team to implement the project is important. The team's actions depend on the entire implementation of the project.

4. Identification of problems. Strategic and current problems that hinder the improvement of the efficiency of the enterprise's activities should be identified.

5. Analysis of problems. A comprehensive analysis of the problems should be conducted to identify their sources and influencing factors.

6. Definition of the strategic goal. The strategic goal should be aimed at solving the main problems that hinder the improvement of the efficiency of the enterprise's activities in the financial aspect.

7. Justification of the directions of efficiency improvement. The main directions of efficiency improvement of the enterprise's activities should be justified, which will be aimed at achieving the strategic goal.

In the future, it would be worthwhile to consider in detail the mechanism for implementing project activities based on the principles of sustainability, environmental friendliness, and social well-being. The authors of the paper also did not address the issue of the positive and negative aspects of combining measures on the quality of personnel, financial, and production status of the enterprise. This is a topic for further research.

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