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# METHODS OF METHODOLOGIES HYBRIDIZATION IN THE MANAGEMENT SYSTEM OF DEVELOPMENT PROJECTS OF SELF-MANAGED ORGANIZATIONS

Abstract. The article proposed methods of hybridization in the implementation of syncretic methodology in projects of self-managed organizations. Challenges facing modern projects, in particular infrastructure restoration projects, are analyzed. Among such challenges, war, the urgent need for restoration projects, the multicultural environment of restoration projects, the need to create a new methodology for managing such projects are highlighted. Analyzed studies that analyzed the mixing of methodologies for managing individual projects or portfolios, in particular in the form of hybridization of management methodologies. Formulated research goal. An analysis of the applicability to hybridization and syncretism and to the use in self-managed organizations and in infrastructure restoration projects of the following mix of methodologies was carried out – a PMBOK-like mix; a mix of PRINCE2-like methodologies, a mix of P2Mlike methodologies; mix of methodologies of IT companies; a mix of separate Agile methodology frameworks; a mix of customized hybrids of Agile methodology frameworks; a mix of hybrids, in each of which the classic methodology is combined with the Agile framework. It was determined that a mix of hybrids, in each of which the classical methodology is combined with the Agile framework, or a mix of hybrids, in each of which the classical methodology is combined with the Agile framework, will be the most adequate for the tasks of the researched project. The concept of "syncretic hybridization" is defined. Four methods of syncretic hybridization of project management methodologies are proposed - the method of simple reactive syncretic hybridization, the method of integral reactive syncretic hybridization, the method of simple proactive syncretic hybridization, the method of integral proactive syncretic hybridization. A description of the methods and a methods implementation schemes are given. A SWOT analysis was conducted, strengths, weaknesses, opportunities arising from the application of the specified family of hybridization methods within the syncretic project management methodology, and threats that may arise were highlighted. Formulated fields of further research in the chosen direction: formalization of interface models of syncretic project management methodology at the level of corporate methodology of a selfmanaged project-oriented organization; formalization of syncretic methodology hybridization methods, expedient expansion of the family of methods; formalization of the criteria for choosing one or another method of syncretic hybridization under different conditions of the internal and external project environment; the use of elements of artificial intelligence in the methods of syncretic hybridization and syncretic methodology in general; practical approbation of models and methods of syncretic hybridization within the syncretic methodology of project management in the implementation by self-managed organizations of projects and portfolios of infrastructure restoration projects of Ukraine. Conclusions from the conducted research are formulated.

Keywords: project and program management; project-oriented organization; self-managed organizations; project management methodology; hybridization of methodologies; syncretic methodology

#### Introduction

The number of challenges facing modern project management systems is increasing. The war in Ukraine, the accelerated development of the IT sector, the threats associated with the development of artificial intelligence, the exponential growth of the level of unpredictability of changes in external influences in general. To overcome these challenges, many projects are being initiated that are interdisciplinary, international, and cross-cultural in

nature. An example of such projects are projects to restore the infrastructure of Ukraine, which suffered and continues to suffer from the military aggression of the russian federation. It is clear that the implementation of complex and complex projects in the environment and conditions described above is impossible or ineffective if it is based on outdated methodological approaches.

New conditions of the external project environment and new realities of difficult and complex modern projects put forth requirements for the development of

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innovative methodological solutions. One of the areas of development of such solutions is the development of syncretic project management methodology.

The essence of the syncretic methodology is that it allows separate parts of the management system to be guided by their separate management methodologies. At the same time, methodologies are interpreted in the core of the management system, and direct and feedback is implemented through core-methodology interfaces. In the case of corporate project management systems, this can be illustrated through a project portfolio management system. At the same time, each project in the portfolio can use its own project management methodology, while the core of the system (project portfolio management system) interprets incoming information flows from through interfaces, and also management influences to portfolio projects also through interfaces.

Infrastructure restoration projects of Ukraine are represented by many participants from different countries, and therefore such participants carry their own management culture, which is also prone to preservation when managing their projects. The core of the recovery portfolio management system must have the properties to provide this capability. Therefore, the subject of models and methods of hybridization of methodologies that would be used in the management of difficult and complex projects or portfolios of projects is relevant.

Consideration of these approaches within the framework of self-managed organizations that appear in line with the latest trend towards non-hierarchical (minimized hierarchical management) adds special relevance.

At the intersection of two trends regarding the updated need to apply new innovative approaches in the management of modern complex projects with many participants representing different management cultures, and regarding the dominance of the vector from the use of the model of self-managed organizations, the relevance of the chosen direction of research regarding the development of a new methodology for managing projects of the development of self-managed organizations is being formed.

This direction is proposed to be implemented within the scope of the syncretic approach using the syncretic methodology [1], which is created precisely to solve the described problems.

## Analysis of latest research

The creation of corporate project management systems is a scientific problem that has been solved for some time. The first basis for building such management systems was the PMBOK standard, due to its earliest appearance as a project management standard. This standard is still successfully developing and integrates leading modern trends at the time of its publication [2].

Another iconic standard in the field of project management, on which corporate systems are built, is the British PRINCE2 standard. Features of its new edition [3]: main focus on people, enhanced flexibility, scalability and adaptability, description of the fields of digital transformation, big data and AI, integration of sustainability and compatibility with Agile, ITIL, Lean, DevOps and Scrum.

The P2M (Program and Project Management for Enterprise Innovation) standard can be attributed to the standards that provide an expanded vision of models and methods of managing project sets in a strategic context. It is relevant for the construction of modern corporate management systems for medium and large organizations that combine project activities into a separate development vector and focus it on a strategic core.

The development of methodologies and standards in the field of project management led to the standardization of relevant processes by the ISO organization. The family of standards of the 21500 series, in particular, reflected conceptual provisions regarding the field of project management [5] and the processes of managing a separate project [6], program management as a related set of projects [7], portfolio management as a relatively unrelated set of organization projects [8], management processes (governance) as higher-level processes related to the management of project activities [9].

A separate direction in the construction of corporate project management systems is the recent trend of using the flexible IT project management methodology Agile [10] and its separate frameworks [11], the use of which has already spread outside the IT industry. The use of modern models of working with large volumes of data in Agile is especially important [12].

The coexistence of methodological components (separate standards or methodologies used in their pure form to manage individual parts of the project) within the syncretic approach is considered in [13]. However, it should be noted that the problem of the coexistence of different methodologies has been studied before. One of the methods of such coexistence is the hybridization of methodologies [14]. Within the limits of hybridization, however, it is allowed to mix models and methods of one methodology used in the corporate project management system with another. The most significant example of hybridization is the combination of traditional project management methodologies (which are sometimes called "classical") with flexible frameworks of the Agile methodology [15] (we consider it erroneous to assign the status of a methodology to a separate Agile framework, such as Scrum).

Separately, research aimed at developing new approaches in the use of mixing methodologies should be highlighted. Starting from works in which such a problem is posed [16], and works in which such a

problem is mentioned within the framework of project management in the form of programs [17] and portfolios [18], to works in which such a problem is solved with a proposal new approaches. Among the latter, it is worth highlighting the work on the use of non-linear strategies [19], models of intelligence and innovative thinking [20].

At the same time, it should be noted that the use of the syncretic approach was not considered in the mentioned publications, except for the works of the author [1,13]. Research on infrastructure project management methodologies (especially in the part of infrastructure restoration projects) is insufficiently researched. In part, such problems were studied in works [14, 19], but the development of the syncretic approach in this context was not considered.

The application of methodological mixes for selfmanaged organizations, the scientific basis of which development is only currently being formed, can also be considered insufficiently researched.

So, in general, it can be concluded that the topic of hybridization of project management methodologies within the syncretic approach to the implementation of infrastructure projects by self-managed organizations is relevant, potentially contains space for the generation of scientific novelty, and is clearly practically valuable.

## Purpose of the article

The purpose of the article is to analyze existing project management methodologies, programs and project portfolios, as well as approaches to their combination in one corporate project management system, and also, based on such analysis, to propose methods of hybridizing methodologies within the syncretic project management methodology for self-managed organizations and defining future directions of research in the context of syncretic methodology.

## The main material of the article

The issue of using several methodological approaches within one system of corporate project management can be implemented through several models.

Based on the results of the analysis [1], three models of the combination of different (one from the other) methodologies in the project management system were determined: convergence, hybridization, syncretism.

In the development of the approaches outlined in [1], we will conduct an analysis of the applicability to hybridization and syncretism and to the use in self-managed organizations and infrastructure restoration projects of the following mix of methodologies (when several methodologies are used in the corporate project management system or under the conditions of hybridization or under the conditions syncretism):

- A mix of methodologies built on the basis of the PMBOK standard of the American PMI Institute;
- A mix of methodologies built on the basis of the
   PRINCE2 standard, which is developed by Axelos a
   joint venture with the Government of Great Britain;
- A mix of methodologies built on the basis of the P2M (Program and Project Management for Enterprise innovation) standard of the Japanese project management association PMAJ;
- Mix of methodologies created and developed by IT companies (Microsoft, Oracle, SAP, etc.) – MSF, PJM and others;
- A mix of individual Agile methodology frameworks (Scrum, Kanban, XP, etc.);
- A mix of customized hybrids of Agile methodology frameworks (Scrumban, etc.);
- A mix of hybrids, in each of which the classic methodology is combined with the Agile framework.

The results of the analysis are given in table. 1, which presents an expert assessment of the specified characteristics on a ten-point scale.

It is worth outlining the direction in which hybridization and syncretism in project management would be combined. This is such a syncretic system of corporate management, in which, for example, each portfolio project is managed by a separate methodology or a separate hybrid, and such methodologies (or hybrids) are not mixed. Therefore, within the scope of the syncretic approach, hybridization is proposed to be applied in separate encapsulated elements guided by separate approaches.

The assessment that was carried out (Table) shows that the mix of hybrids, in each of which the classical methodology is combined with the Agile framework, or the mix of hybrids, in each of which the classical methodology is combined, will be most adequate to the tasks of the researched project at the intersection of its branches with the Agile framework. In this way, syncretism as a higher-level principle will combine conditionally isolated subsystems of the project, which will use the specified hybrids in management.

Next, we will consider how it is proposed to carry out the hybridization of methodologies within the syncretic approach. At the same time, we will define the term "syncretic hybridization".

<u>Definition.</u> Syncretic hybridization is a combination of project management methodologies within one corporate project management system of a project-oriented organization, in which individual elements of the project are managed using hybrid methodologies, and, in accordance with the principle of syncretism, such hybrid methodologies do not mix with each other.

In the development of research, we will propose four methods of syncretic hybridization of project management methodologies and describe them.

Table – Analysis of methodological mixes applicability	
to studied projects in hybridization and synergism contex	t

Nº	Base of the methodological mix	Expected applicability to hybridization	Expected applicability to syncretism	Expected applicability for use in self- managed organizations	Expected applicability to infrastructure restoration projects
1	Compiled on the PMBOK-based standards	9	10	8	7
2	Compiled on the PRINCE2-based standards	8	10	7	8
3	Compiled on the P2M-based standards	7	10	7	8
4	Compiled on the IT companies methodologies	8	9	8	5
5	Compiled on the separate frameworks of the Agile methodology	8	9	9	6
6	Compiled on the customized hybrids of Agile methodology frameworks	9	8	10	9
7	Compiled on the customized hybrids of classic project management methodologies	9	9	10	8
8	Compiled on the hybrids, where the classic methodology and the Agile methodology framework are used together	10	10	9	10

1. The method of simple reactive syncretic hybridization.

It consists in the alternate reaction of the core of the syncretic management system (syncretic model) to information from parts of the project (portfolio projects) managed by separate methodologies or hybrids. Here and further in the methods of syncretic hybridization, for the sake of simplicity, we will describe the interaction of individual projects, managed by individual hybrid methodologies, with the project portfolio management system. Although the application of the method to the interaction of individual parts of the project, which are managed by their own management methodologies (or methodological hybrids according to Table), with the project management system as a whole, is also similar.

Therefore, the specified method assumes that the portfolio management system (in the form of a syncretic model) first processes information from the first project, which is managed by the  $M_I$  management methodology. At the same time, the syncretic model receives information from the first project through the  $T_I$  interface, and through the same  $T_I$  interface transmits the control influence from the portfolio management system to the first project. At the same time, the function of the interface is to interpret the semantics of models and methods of the  $M_I$  methodology in a certain universal language. Such a language is needed to interpret the semantics of models and methods of all methodologies  $M_I \dots M_8$  used by portfolio projects.

After information processing and impact on the first project, information processing and management impact on other projects takes place (in the example -8).

The method is reactive because it manages through direct response to changes in projects and does not use forecasting of such changes. The method implementation scheme is shown in Fig. 1.

2. The method of integral reactive syncretic hybridization.

It consists in the implementation by the core of the portfolio management system (syncretic model) of simultaneous multidirectional reaction (complex management influence) on all projects of the project portfolio.

Thus, the core of the project portfolio management system receives information from all projects at the first step (arrows 1 in Fig. 2). At the same time, the syncretic model through interfaces  $T_1...T_8$  receives information from all portfolio projects (managed by methodologies  $M_1...M_8$ ), and through the same interfaces  $T_1...T_8$  transmits control influences from the portfolio management system to each project (arrows 2 in Fig. 2).

The difference with the previous method is that the collection of information from all projects before the implementation of the management influence allows you to aggregate individual management influences and minimize costs at the same time. Thus, the controlling influence of the same type can be an effective response to changes in several projects. The delay before exercising managerial influence is thus capable of minimizing time, financial and labor costs on the part of the syncretic model of portfolio management.

The method, like the previous one, is also reactive, because it also manages through direct response to changes in projects and does not use forecasting of such changes.

The method implementation scheme is shown in Fig. 2.

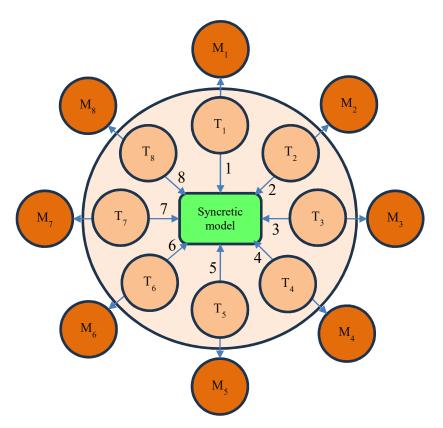


Figure 1 – Implementation scheme of the simple reactive syncretic hybridization method

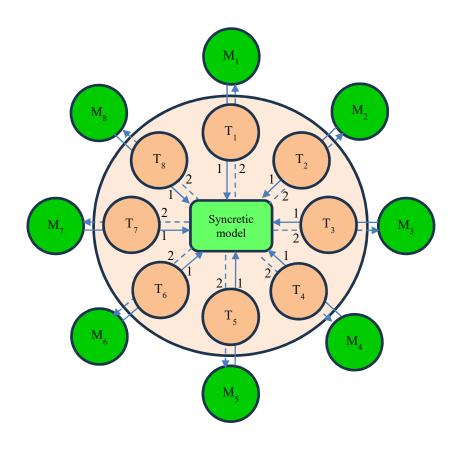


Figure 2 – Implementation scheme of the integral reactive syncretic hybridization method

3. Method of simple proactive syncretic hybridization.

It consists in the implementation by the core of the portfolio management system (syncretic model) of a simple prognostic algorithm that should predict changes in portfolio projects based on information about changes in one of these projects.

Thus, the core of the project portfolio management system receives information from one of the projects at the first step (arrow 1 in Figure 3). At the same time, the syncretic model interprets information from the first project, which is managed by the  $M_I$  methodology through the  $T_I$  interface.

Next, a syncretic model using a forecasting algorithm predicts changes that may occur in other portfolio projects (based on changes in the first). And further, management influences on all projects of the portfolio are generated, taking into account the specifics of each project.

Controlling influences (arrows  $2^1...2^8$  in Figure 3) are transmitted through interfaces  $T_1...T_8$  from the portfolio management system to each project controlled by methodologies  $M_1...M_8$ .

At the same time, the method can be identified as proactive, since the control system (syncretic model) performs the function of forecasting. However, proactivity can be considered simple, since such forecasting is based on changes in one of the projects in

the portfolio (unlike the next method, which will be described later).

The method implementation scheme is shown in Fig. 3.

4. Method of integral proactive syncretic hybridization.

It consists in the implementation by the core of the portfolio management system (syncretic model) of an advanced prognostic algorithm, which is supposed to generate the controlling effects of predicting possible future changes in portfolio projects based on information about changes in all projects that have taken place over some previous time.

Thus, the core of the project portfolio management system receives information from all projects in the first step (arrows 1 in Figure 4) and, after some time, in the second step (arrows 2 in Figure 4). After analyzing the changes that have occurred in the portfolio projects over a period of time, the core of the portfolio management system (syncretic model) performs the simulation of the dynamics of such changes and their forecasting for the future.

On the basis of the realized forecast, the syncretic model generates proactive management influences and through  $T_1...T_8$  transfers such management influences from the portfolio management system to each project (arrows 3 in Figure 4), which are managed by methodologies  $M_1...M_8$ .

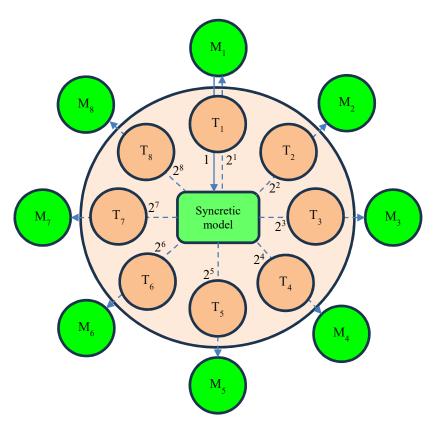


Figure 3 – Implementation scheme of the simple proactive syncretic hybridization method

The difference with the previous method lies in the fact that the collection of information from all projects before the implementation of management influence, in addition, a certain period of implementation of such collection, allows you to aggregate individual management influences and minimize costs at the same time (time, finances and labor costs).

At the same time, the method can be confidently identified as proactive, since the control system (syncretic model) performs the function of forecasting. Such proactivity can be considered integral, since such forecasting is carried out on the basis of changes in all projects of the portfolio, even for a certain medium-term time (in contrast to the previous method, which implements simple proactivity).

The method implementation scheme is shown in Fig. 4.

Let's conduct a SWOT analysis of the proposed group of methods for use by self-managed organizations in infrastructure restoration projects. Let's highlight their strengths, weaknesses, opportunities arising from their application, and threats that may arise.

Strengths.

S1. Provision of rapid response and forecasting (reactive and proactive principle) in the management of a portfolio of projects managed by various methodologies.

- S2. Providing a variety of models and methods used in the management of the project portfolio, for many levels of complexity of the management system.
- S3. Innovativeness, simplicity, but, at the same time, high relevance of the described methods and syncretic methodology in general.

Weakness.

- W1. Insufficient development and formalization of relevant scientific developments.
- W2. Insufficient level of practical approbation of the proposed methods within the syncretic methodology.
- W3. Relative complexity (perhaps excessive) for implementation by small self-managed teams and organizations.

Opportunities.

- O1. The possibility of self-adjustment (adaptation) of the methods of syncretic methodology thanks to the use of elements of artificial intelligence.
- O2. The possibility of switching the depth of control, which can be implemented by choosing one or another method under different conditions of the external and internal environment.
- O3. The possibility of increasing the skills and general competence of project management participants in a self-managed organization. What will provide the foundation for increasing the efficiency of the management system for each subsequent project (portfolio).

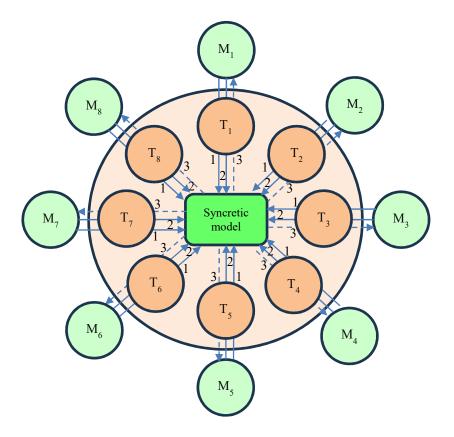


Figure 4 – Implementation scheme of the integral proactive syncretic hybridization method

Threats

T1. The threat of methodological confusion in case of choosing an inadequate method of syncretic influence due to an incorrect assessment of the external and internal environment and corresponding changes in portfolio projects.

T2. The threat of incorrect settings of syncretic model parameters, in particular interfaces to individual methodologies, as a result of which methodologies may be mixed, or the influence of the core of the syncretic management system on individual projects will not be effective enough.

T3. The threat of inaccuracy of forecasts that will implement the methods of syncretic hybridization, as a result of which the effectiveness of the methods of the syncretic methodology will be reduced, which may lead to the refusal of its use and/or the exit of the portfolio projects beyond the limits defined by the customers.

According to the results of the SWOT analysis, it can be concluded that when using the possibilities of the proposed family of syncretic methodology, its threats can be overcome, and its advantages outweigh the corresponding disadvantages.

We formulate the prospects for further research in the chosen direction based on the results of the conducted research:

- 1. Formalization of interface models of syncretic project management methodology at the level of corporate methodology of a self-managed project-oriented organization.
- 2. Formalization of hybridization methods of syncretic methodology, expedient (if necessary, to be determined) expansion of the family of methods.
- 3. Formalization of criteria for choosing one or another method of syncretic hybridization under different conditions of the internal and external project environment.

4. The use of elements of artificial intelligence in the methods of syncretic hybridization and syncretic methodology in general.

Practical testing of models and methods of syncretic hybridization within the syncretic methodology of project management during the implementation by self-managed organizations of projects (portfolios of projects) to restore the infrastructure of Ukraine.

# Conclusion

External conditions and threats, which stop primarily in front of Ukraine, but also in front of the whole world as a whole, which includes the war with its destructive influence and the rapid development of IT, the internationalization of business, the need for recovery projects with different participants representing different cultures - form the request on the development of an methodological base and developments in this direction. The syncretic project management methodology of self-managed organizations proposed and developed by the author is one of the possible (and potentially the most adequate) answers to the mentioned challenges.

In this article, the concept of hybridization of methodologies was formalized, known and possible hybrids were analyzed, as well as the effectiveness of their possible inclusion in the syncretic methodology, and the basis for the development of syncretic hybridization methods was provided. A conclusion was made regarding the most acceptable hybrids for use by self-managed organizations (within the syncretic approach) in the field of implementation - in infrastructure restoration projects of Ukraine.

The development of a syncretic project management methodology and its effective application for the implementation of reconstruction projects can increase the probability of success of such projects and closer the prosperity of Ukraine after the victory.

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# МЕТОДИ ГІБРИДИЗАЦІЇ МЕТОДОЛОГІЙ В СИСТЕМІ УПРАВЛІННЯ ПРОЄКТАМИ РОЗВИТКУ САМОКЕРОВАНИХ ОРГАНІЗАЦІЙ

Анотація. Запропоновано методи гібридизації при реалізації синкретичної методології у проєктах самокерованих організацій. Проаналізовано виклики, що постають перед сучасними проєктами, зокрема проєктами відновлення інфраструктури. Серед таких викликів виокремлено: війну, нагальну потребу у проєктах відновлення, багатокультурне середовище проєктів відновлення, потребу у створенні нової методології управління такими проєктами. У дослідженнях проаналізовано змішування методологій для управління окремими проєктом або портфелем, зокрема у формі гібридизації методологій управління. Сформульовано мету дослідження. Проведено аналіз щодо застосовності до гібридизації, синкретизму та до використання в самокерованих організаціях і в проєктах відновлення інфраструктури таких міксів методологій: мікс PMBOK-подібних; мікс PRINCE2-подібних методологій; мікс P2M-подібних методологій; мікс методологій ІТ-компаній; мікс окремих фреймворків методології Agile; мікс кастомізованих гібридів фреймворків методології Agile; мікс гібридів, в кожному з яких класична методологія поєднується з фреймворком Agile. Визначено, що до задач досліджуваного проєкту найбільш адекватно належить мікс гібридів, в кожному з яких класична методологія поєднується з фреймворком Agile, або мікс гібридів, в кожному з яких класична методологія поєднується з фреймворком Agile. Надано визначення поняттю «синкретична гібридизація». Запропоновано чотири методи синкретичної гібридизації методологій управління проєктами: метод простої реактивної синкретичної гібридизації, метод інтегральної реактивної синкретичної гібридизації, метод простої проактивної синкретичної гібридизації, метод інтегральної проактивної гібридизації. Наведено опис методів і схеми реалізації методів. Проведено SWOT-аналіз, виокремлено сильні сторони, слабкі сторони, можливості, що виникають при застосуванні зазначеного сімейства

методів гібридизації в межах синкретичної методології управління проєктами, і загрози, що можуть виникнути. Сформульовано галузі подальших досліджень у вибраному напрямі: формалізація моделей інтерфейсів синкретичної методології управління проєктами на рівні корпоративної методології самокерованої проєктно-орієнтованої організації; формалізація методів гібридизації синкретичної методології, доцільне розширення сімейства методів; формалізація критеріїв вибору того чи іншого методу синкретичної гібридизації для різних умов внутрішнього і зовнішнього проєктного оточення; використання елементів штучного інтелекту в методах синкретичної гібридизації і синкретичній методології загалом; практична апробація моделей і методів синкретичної гібридізації в межах синкретичної методології управління проєктами при реалізації самокерованими організаціями проєктів і портфелів проєктів відновлення інфраструктури України. Сформульовано висновки з проведених досліджень.

Ключові слова: управління проєктами і програмами; проєктно-орієнтована організація; самокеровані організації; методологія управління проєктами; гібридизація методологій; синкретична методологія

#### Link to publication

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