

# Conceptual Model of Syncretic Methodology Data of Development Projects Management for Self-managed Organizations

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## Abstract

The task of researching self-managed organizations and developing a syncretic methodology for them is set. The relevance of the task is justified. An example of the application of syncretic methodology for restoration projects is illustrated. A review of the literature was carried out, based on the results of which the research on the construction of corporate project management methodologies was analyzed, in particular, based on the combination of several approaches. The purpose and objectives of the research are formulated. The main features of self-managed organizations are defined. A model of the management system of a self-managed organization is proposed. The elements of the model are characterized. The model offers four types of feedback - positive feedback inside, positive feedback outside, negative feedback inside, negative feedback outside. Also, three types of analyzers are proposed within the model - external impact analyzer, internal impact analyzer, smart analyzer of impacts synergism. Conceptual model of development projects management in self-managed organizations by syncretic methodology is proposed. The conceptual model is formulated in a plural form. The elements of the model are characterized. Syncretic methodology is defined as the most important element of the model. The main distinguishing feature of the syncretic methodology is determined - the use of separate methodologies by individual subsystems of the project without mixing such methodologies. Conceptual model of syncretic methodology is proposed. The main element of such a model can be considered interfaces that transform information from input methodologies, their models and methods, into a conditionally universal form, for the interpretation of control influences through the same interfaces back to projects from the syncretic control system. The task of optimizing the syncretic methodology of managing development projects of self-managed organizations has been formulated. A SWOT analysis of the conducted research has been carried out. Based on the results of the SWOT analysis, the prospects and potential effectiveness of the given models were determined. Conclusions from the research are formulated. Prospects for further research in the chosen direction are outlined.

## Keywords

Data analysis, project and portfolio management, smart approach, self-managed organization, syncretic methodology, conceptual model

## 1. Introduction

The development of project management methodologies allows directing them to solve tasks of increasing complexity. Modern project management methodologies are focused, in particular, on the implementation of smart projects in a smart environment that brings the smart future closer. The implementation of infrastructure restoration projects, which modern Ukraine urgently needs [1], should be based on modern innovative project management methodology. Among the features of such a methodology should be not only high efficiency, which is always required from such fundamental developments. It is not only a matter of minimizing the costs of resources of all kinds (time, finances,

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resources) to ensure the constant quality of the project's product. And not only in adaptation to the conditions of project-oriented organizations. Such tasks, as well as their solutions, are commonplace in the modern smart world of project management.

Infrastructure restoration projects of Ukraine are characterized by a large scale. Many participants will be involved in the implementation of such projects, and those representing not only different approaches to management. And also different cultures, different project management methodologies, and also with the peculiarities of their implementation in a specific environment, in a specific country. An important principle for the involvement of international participants in restoration projects will be permission for each participant to use their methodological developments in their pure form. Therefore, the management system of such a project must contain a core that will ensure such compatibility. The corresponding principle requires the use of a special project management methodology built on the principle of syncretism. Not mixing separate methodologies in different components of the project, implementing coordinated management of all such components is the task of syncretic project management methodology. As a result of insufficient development of such methodology, along with its high relevance for future projects, methodological research in this direction is scientifically and practically justified.

It is also worth noting that the above is equally applicable to individual projects (where individual components will be managed by different methodologies) and to portfolios. In portfolio management (which will be more typical of state-level restoration project management systems), individual projects can be implemented by different contractors within the limits of individual methodologies. Mixing such methodologies is not acceptable from the point of view of preserving the management culture of each contractor, within which it has proven its effectiveness for years. Therefore, the appropriate methodological approach in such a case should also be defined as syncretic.

Separately, the tendency of modern project management teams to implement simple, non-hierarchical organizational structures should be noted. In the context of the development of self-managed organizations, there is an opportunity to shorten decision-making chains, as well as to additionally ensure the flexibility of the management system. It can be expected that such teams will be involved in the implementation of infrastructure restoration projects in Ukraine, which additionally substantiates the relevance of the topic of this study.

## 2. Literature review

The modern world of the project management field has given birth to many methodological developments, most of which have already become classics. In particular, this applies to the Guide to the Project Management Body of Knowledge (PMBOK) standard of the American PMI Institute. In its latest edition [2], the PMBOK standard offers a fundamentally new approach to modern project management. The basis of the new approach is a smaller number of fields of knowledge, the introduction of management principles as a separate context of the methodology and a proposal for the application of the tailoring domain to adapt PMBOK methodological developments to the conditions of a project-oriented organization implementing this standard. The classic standards should also include the work of the ISO organization related to project management [3]. This standard is largely based on the principles and approaches that form the basis of the previous version of the PMBOK standard, and contains more than 40 formalized processes in the field of project management.

At least two more standards can also be attributed to the classic project management standards that can act as components of the syncretic methodology. Namely, the standard of the Japanese P2M project management association [4], in which the project is considered through the prism of the Japanese approach to management, and in which the concept of value in project management appears for the first time (moreover, the definition of the project is formulated as an obligation to create value). As well as the PRINCE2 [5] standard of the British Project Management Association, which contains at least two distinctive features – it comes from the IT industry and is supported by the state. However, it is worth noting that project management in the organization, which is based on the use of one classical methodology, belongs to those times that preceded the agile world, which originates from IT.

It was the IT industry that gave the next impetus and defined the key trend of recent years in project management – flexibility (Agile). The corresponding methodology [6] was initially used only in IT projects, now it is found even in its pure form in non-IT project management systems.

Another significant trend in the construction of corporate project management methodologies is the trend of mixing several classic methodologies to build a corporate methodology. In the early stages of the development of this trend, the hybrid consisted of a mix of only IT methodologies (for example, Scrumban, which is a combination of two flexible approaches, Scrum and Kanban). Later, hybrids began to develop [7], consisting of one classical methodology and one IT (for example, MSF + Agile). Subsequently, any combination of any project management methodologies (regardless of their origin) that are fully or partially included in the corporate methodology began to be considered hybrids. Research on the hybridization of project management methodologies within the framework of creating a single corporate methodology (which will have hybrid characteristics) was solved in many works. In particular, in the context of ensuring the stability and flexibility of management systems, evolutionary principles of self-organization [8], aspects of using hybrid methodology and building perspective models etc.

In general, the task of choosing a project management methodology based on elements from other methodologies was solved in particular within the framework of the construction of bi-adaptive methodology and meta-methodology of project management. All classic standards can be components of a syncretic project management methodology as used by a separate project component (a separate project from a project portfolio) and require syncretic interfaces to be implemented by the project management system (or, accordingly, the portfolio) as a whole [9].

### **3. Research purpose and objectives**

The purpose of this study is to develop the models of the syncretic methodology of managing development projects of self-managed organizations include the model of data interpretation in this methodology.

Based on the goal that was formulated, the following tasks of this research can be identified:

- analysis of self-managed organizations as an object of research;
- propose the control system model of self-managed organization;
- propose the conceptual model of development projects management in self-managed organization by syncretic methodology;
- propose the conceptual model of syncretic methodology;
- propose the model of interconnected life cycles of syncretic methodology implementation and CRISP-DM;
- carrying out a SWOT analysis of the conducted research;
- formulation of conclusions based on research results.

### **4. Formalization of the conceptual model**

The context of this study was chosen as "turquoise" or self-managed organizations. As the main features of such organizations, two key ones can be identified:

- denial of hierarchy as a management principle;
- denial of the administrative style of management.

Instead, as an antithesis to the first feature in self-managed organizations, the principle of equality of team members, in particular in decision-making, is proposed. As an antithesis for the second feature, a high internal motivation of team members is proposed, which allows:

- simplify the processes and procedures of the project management system;
- minimize bureaucracy;
- ensure high quality of management decisions;
- increase the speed of project implementation;
- ensure management flexibility;
- implement proactive project management;
- apply appropriate smart management tools in the corporate methodology.

We will propose a model of the management system of a self-managed organization (Figure 1) for the purpose of further research on the application of syncretic methodology in such organizations.

The basis of the management system is a model of a self-managed organization, which, from the point of view of the management system model, acts as a "black box". That is, it is considered as an object with a set of input and output signals. At the same time, the input signals are transformed into output signals in a certain way, and the processes that carry out such a transformation are not considered at this level of analysis.

The model of self-managed organization (SMO) receives one external input signal – from the environment. The content of this signal is a set of external influences, the basis of which are influences from stakeholders. Initially, all external impacts are subject to consideration through the external impact analyzer. At the same time, it is preliminarily determined which type of feedback is adequate to the input influence. On the other hand, a self-managed organization can be characterized by a certain set of parameters (which can be considered as internal impacts), which are measured by the internal impact analyzer. The analyzed external and internal impacts are perceived by smart analyzer of impacts synergism. The purpose of further analysis is smart consideration of influences in their totality, to select an adequate set of feedbacks in response to a set of input influences. In the future, the system model of self-managed organization generates management impact on the organization through one of the models of management impact execution.

Thus, taking into account the above, a multiple model of a self-managed organization can be presented in the following form:

$$O = \langle S, R, I, A_1, A_2, A_3, F, E \rangle, \quad (1)$$

where  $O$  – set model of self-managed organization;

$S$  – set of SMO entities defining its internal structure and connections within it;

$R$  – set of parameters of a self-managed organization subject to self-regulation;

$I$  – set of impacts on the self-managed organization from the external environment;

$A_1$  – set models of external impact analyzer (EIA);

$A_2$  – set models of internal impact analyzer (IIA);

$A_3$  – set models of smart analyzer of impacts synergism;

$F$  – set models of feedback (models of positive feedback inside, positive feedback outside etc.);

$E$  – set models of management impact execution.

It is worth noting that all elements included in the model defined above are themselves sets. Studies of their structure and interrelationships outline one of the aspects of the perspective of further research. However, it can be noted that, for example, the set of influences on a self-directed organization is a complex set with complex relationships. Such a set will be partially revealed in the next model.

Regarding the variants of the mathematical apparatus that can be applied for further studies of the model defined above, the following can be indicated (in particular, but not limited to):

- theory of automatic control;
- theory of fuzzy sets;
- game theory;
- big data theory;
- optimization theory;
- other theory.

When considering the implementation of a syncretic methodology in a self-managed organization, it is worth identifying the relevant main elements. We will offer a conceptual model of development projects management in SMO by syncretic methodology (Figure 2).

If we consider the set of elements of the conceptual model as separate sets, we can formulate the proposed conceptual model in a plural form:

$$C = \langle O, I_1, I_2, P, E, M, W \rangle, \quad (2)$$

where  $O$  – control system model of SMO (1);

$I_1$  – sources set of external impact;

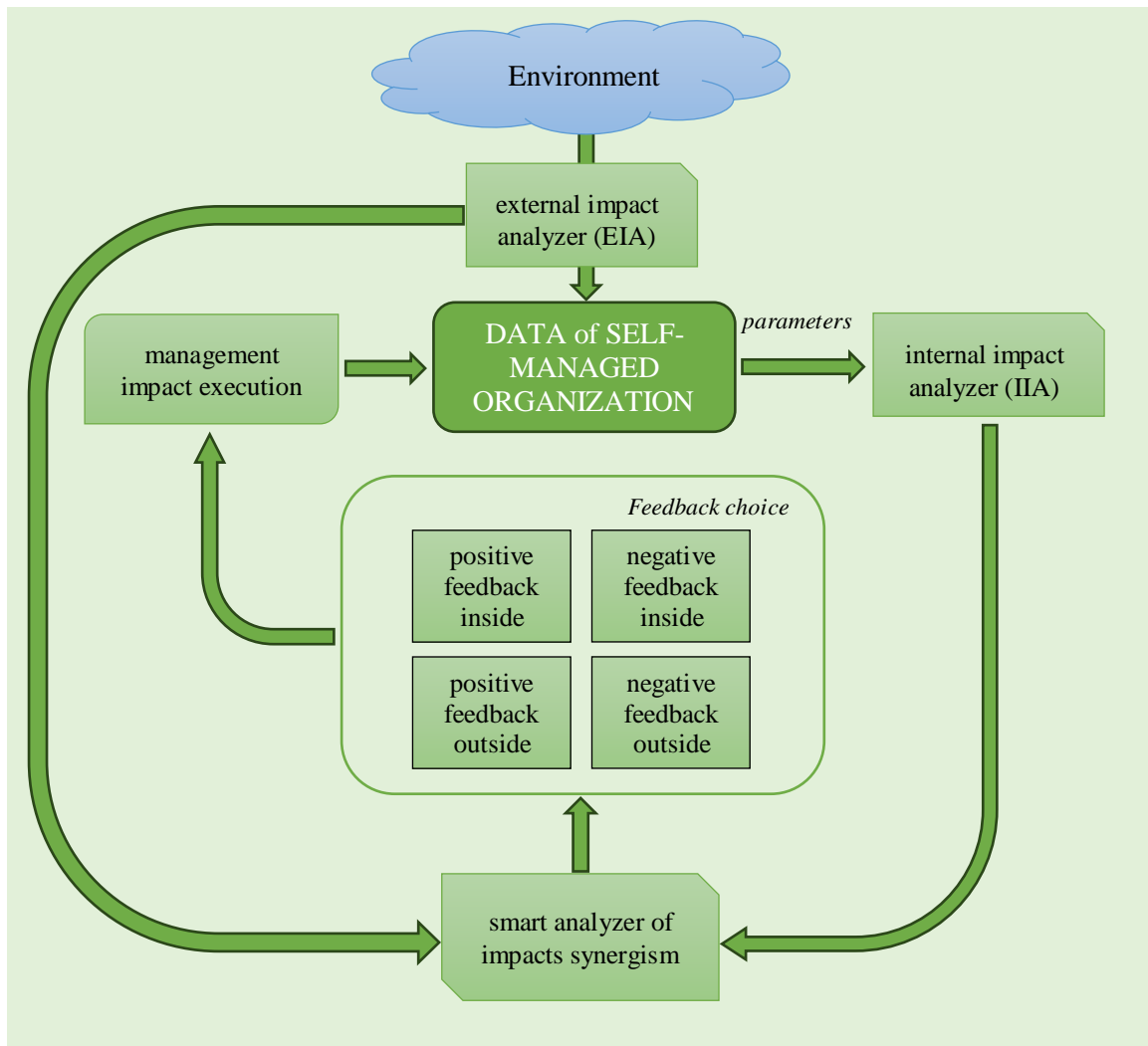
$I_2$  – set of contents of external impact;

$P$  – set of project entities (projects, programs, portfolios);

$E$  – set of entities of operational activity;

$M$  – corporate management methodology of SMO;

$W$  – organizational process assets.



**Figure 1:** Control system model of self-managed organization data

Syncretic methodology of project management acquires special importance in the mentioned conceptual model.

If we consider the corporate management methodology of SMO (element M from formula 2), then its internal structure contains the following elements:

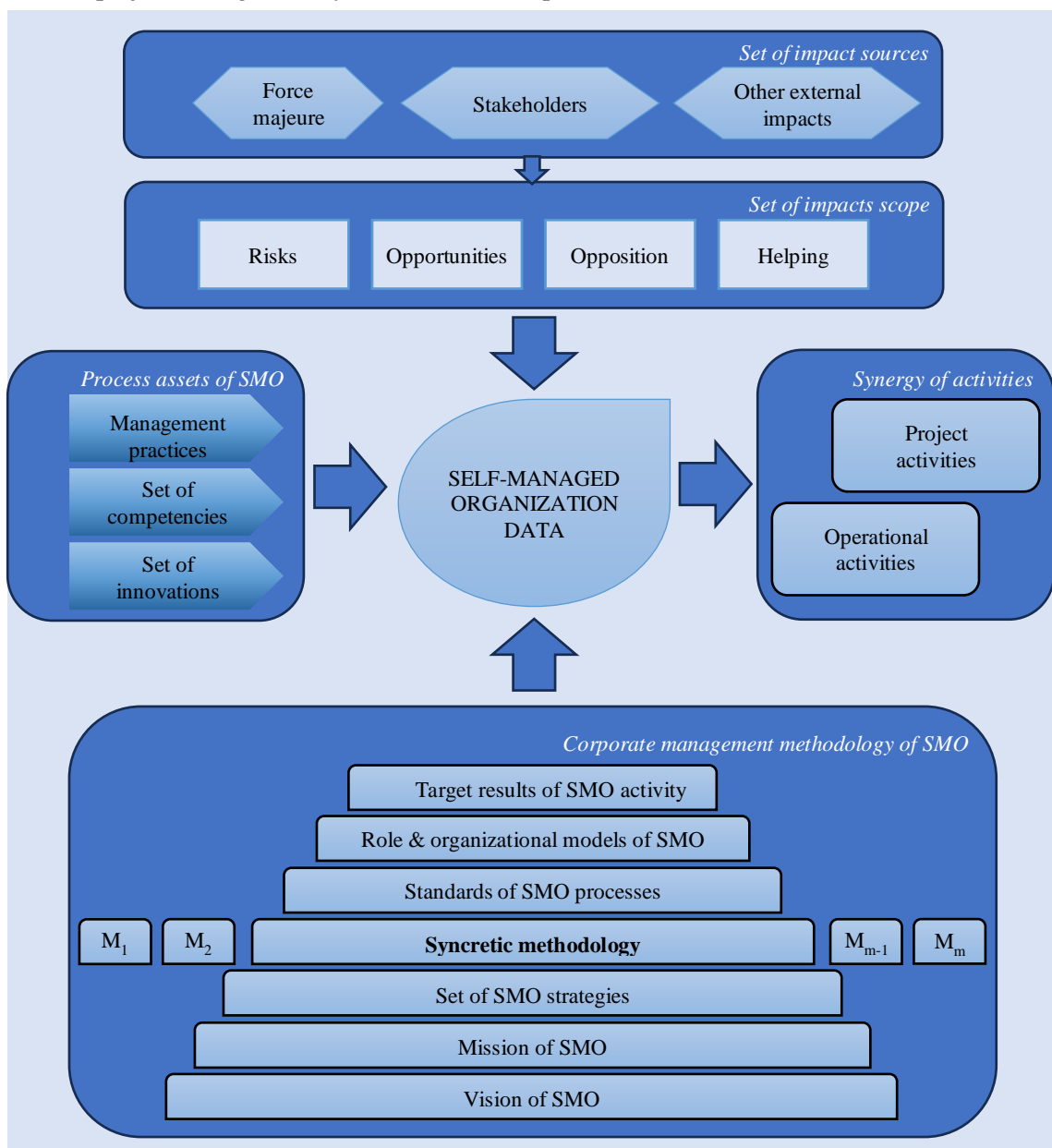
- Vision of SMO;
- Mission of SMO;
- Set of SMO strategies;
- Syncretic methodology;
- Standards of SMO processes;
- Role & organizational models of SMO;
- Target results of SMO activity.

At the same time, the essence of the syncretic methodology of project management is to manage individual parts of the project within the framework of a separate methodology. At the same time, these methodologies should not be mixed. However, the project management system as a whole must interpret information from individual parts of the project (which managed by its own methodology) and transform it to manage other parts of the project (which managed by another methodology).

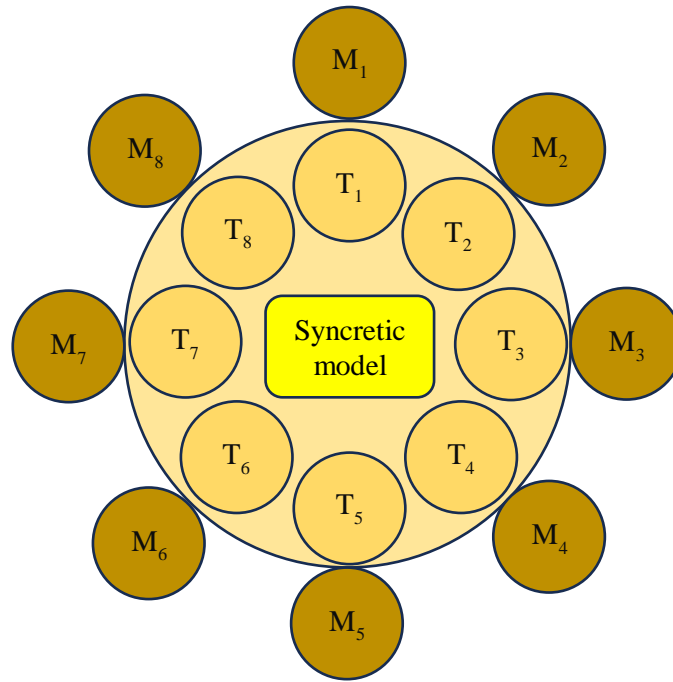
Therefore, if there are methodologies  $M_1 \dots M_m$  in the project management system of a self-managed organization, there must be interfaces that transform the language of models and methods of each used methodology into the language of models and methods of the syncretic methodology, which is implemented at the top level of project management –  $T_1 \dots T_m$  (Figure 3). When considering portfolio management, the relevance of the syncretic management methodology can be illustrated even more

vividly. In particular, international projects with many participants (customers, investors, contractors, etc.) can be considered relevant projects. An example of such projects are projects to restore the infrastructure of Ukraine. Individual projects in portfolio may use a project management methodology that may be determined by a specific investor (for example, a donor that will provide funding).

It hardly makes sense for the customer of the portfolio (the state) to demand the implementation of the project in a certain methodology or to impose it. After all, with a high probability, it can be assumed that investors, within the limits of their experience, have achieved a certain level of success within the boundaries of the methodologies in which they worked. Therefore, imposing a different methodology (besides the fact that it is not entirely correct) means potentially reducing the effectiveness of projects. And therefore, to increase the time of their implementation and increase the final cost. Which is not appropriate. Therefore, projects (one or more) that will use their own methodology will certainly appear within the restoration portfolios. At the same time, there is a need to ensure consistency of such methodologies at the level of portfolio management, when they are different at the level of individual projects. Syncretic methodology solves this problem. At the base of the syncretic model of the management system, conditionally universal models should be built, which would be translated into individual project management systems with the help of interfaces.



**Figure 2:** Conceptual model of development projects management in SMO by syncretic methodology



**Figure 3:** Conceptual model of syncretic methodology

On the other hand, the same interfaces would allow interpreting information from different methodologies in the language of conditionally universal models. The conditionality of this universality lies in the assumption that absolute universality in itself can be achieved only in a specific system of syncretic management. However, this assumption requires verification within the scope of further research in this direction.

Ultimately, within the scope of using syncretic project management methodology, the task of implementing the most effective development can be formalized in the form of an optimization task.

$$Q = \left( \left( \sum_{j=1}^J k_j \cdot b_j - \sum_{n=1}^N k_n \cdot l_n \right) - L \right) \rightarrow \max, \quad (3)$$

where  $Q$  – optimization function;

$b$  – benefits from the use of syncretic methodology;

$l$  – the relative costs arising from the use of a syncretic methodology in a self-managed organization compared to the absence of such use;

$L$  – costs of implementing a syncretic project management methodology in a self-managed organization;

$k$  – weighting coefficients of the importance of benefits and costs;

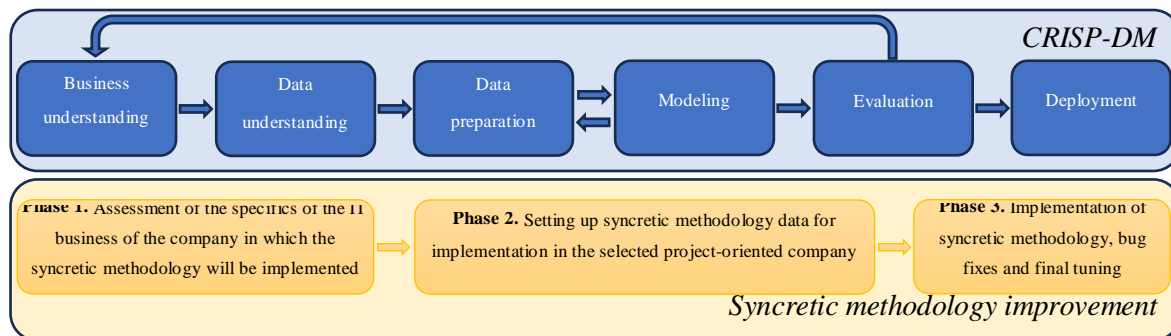
$j, n$  – indices such that  $J$  is the number of identified benefits,  $N$  is the number of identified relative costs; indices are suggested to be determined expertly.

The solution of the optimization task is planned to be carried out (after its detailing) by the methods of optimization theory. A promising method for this is the method of linear programming.

## 5. Data analysis of self-managed organization

Data within the implementation of the syncretic project management methodology require processing, analysis and effective use. According to the results of the analysis of the methodologies for working with data, the CRISP-DM methodology was found to be adequate for the tasks of the syncretic approach. Working with data according to the CRISP-DM methodology consists in the cyclic implementation of the following stages: Business understanding, Data understanding, Data preparation, Modeling of a data, Evaluation of a data. Upon completion of the specified cycles, the Deployment of a data stage takes place [10].

Data understanding is an important element of the CRISP-DM process, since the data of the syncretic methodology of managing complex projects is too sensitive to errors of both an operational, methodological, and process nature. Consider the stages of CRISP-DM in relation to the phases of syncretic methodology implementation in a project-oriented IT company (Figure 4).



**Figure 4:** Model of interconnected life cycles of syncretic methodology implementation and CRISP-DM

*1. Assessment of the specifics of the IT business of the company in which the syncretic methodology will be implemented.*

Within the first phase of the syncretic methodology implementation project, it is necessary to dive into the specifics of the customer's business. Therefore, this phase of the project closely overlaps with the Business understanding in CRISP-DM phase. It is important to understand that the work of a modern company is described by a large amount of data that must be analyzed at this stage in the context of understanding the customer's business. The formulation of data mining goals will allow to move to the target set of data that will need to be processed in the context of preparation for the implementation of the syncretic methodology. It is also worth noting that within this phase there should also be a Data understanding, the required array of which is determined at the business understanding stage.

*2. Setting up syncretic methodology data for implementation in the selected project-oriented company.*

This phase of syncretic methodology implementation consists in setting up the required set of prepared data for the enterprise, where the syncretic methodology will be applied. That is, the current phase can be associated to the stages of Data preparation, Modeling and Evaluation in the data analysis project according to the CRISP-DM standard.

Therefore, before the next stage, which is directly associated with the implementation, the data on the project-oriented company will be prepared and cleaned, the necessary models will also be built (based on hypotheses) and appropriate conclusions will be drawn, which will provide the necessary analytical basis for the implementation of the syncretic methodology.

*3. Implementation of syncretic methodology, bug fixes and final tuning.*

The phase of implementation of syncretic methodology at a project-oriented enterprise directly concerns the setting of the main methodological components: organizational component (organizational structure, duties of participants in the management process – process roles), the regulatory part (descriptions of the processes implemented by the syncretic management system; description of the management methodologies that will be included in the syncretic methodology as components); IT tools that will implement a syncretic methodology based on the data collected and processed in the previous phases. Integration is one of the important tasks of both this phase of the implementation project and the corresponding phase of the CRISP-DM standard.

According to the CRISP-DM standard, this phase of syncretic methodology implementation corresponds to the Deployment stage. Development projects, infrastructure restoration projects require the use of modern management methodologies, as well as careful work with data within the limits of such methodologies. Therefore, the use of the proposed combination of syncretic management approaches and the CRISP-DM data standard for such projects is a promising direction for further research in the chosen direction. In the future, a number of models of joint use of these approaches (syncretic and CRISP-DM) can be developed to improve the efficiency of project management systems for project-oriented enterprises.



## 6. SWOT-analysis

Based on the results of the research, we will offer an analysis of its results in the SWOT format (**Error! Reference source not found.**).

**Table 1**  
SWOT-analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Relevance of the task</li> <li>• Scientific basis</li> <li>• Increasing SMO maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Difficulty of implementation</li> <li>• Untested methodology</li> <li>• Incompatibility of methodologies is possible</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Implementation of complex projects</li> <li>• International cooperation</li> <li>• Expansion of competences</li> </ul>	<ul style="list-style-type: none"> <li>• Approbation errors</li> <li>• Failure to accept the methodology</li> <li>• The appearance of more complex tasks</li> </ul>

The brief SWOT analysis that was conducted, of course, requires expansion. First, it can be detailed and deepened in the form given. Secondly, it can be presented in the second form, where strategies for overcoming weaknesses and threats are determined with the help of strengths and opportunities. Thirdly, relevant developments can determine the direction of further research on this topic.

However, in any case, it should be noted that according to the results of the SWOT analysis, the syncretic methodology of project management of self-managed organizations is a potentially interesting area of research, the strengths and opportunities of which will potentially outweigh its weaknesses and overcome the threats that may arise from its use.

The described models were implemented in the implementation of a portfolio of infrastructure restoration projects in Ukraine. The pilot implementation phase is currently underway. When working with the database of projects and portfolios of restoration projects that was formed, used the model depicted in fig. 4. The expected efficiency of the proposed models and methods, which was evaluated by experts, is up to 20%. The indicated efficiency may include a reduction in the time of implementation of restoration projects and portfolios, a reduction in the budget overspending rate, and optimization of the use of labor resources involved in the implementation of such projects and portfolios.

## 7. Conclusion

Modern projects and project portfolios are implemented in a cross-cultural environment. Different participants from different countries and organizations are involved in the implementation of such projects. At the same time, such participants often come with their project management methodologies, which they do not want to change. There is a practical task of developing a project management methodology in which project participants could use their own methodology without mixing it with the methodologies of other participants.

As for the practical aspect of the implementation of the mentioned task, it is worth noting that the infrastructure restoration portfolios of Ukraine will potentially contain participants from different countries under the patronage of numerous international organizations. The process of involving such organizations has already begun. It is known that different organizations and companies use different project management standards, which have been developed in a fairly large number in the world.

In particular, some organizations within the framework of the United Nations use the PRINCE2 methodology. American companies tend to prefer the PMBOK standard for project management. Japanese companies, corporations and government organizations mainly use the P2M standard for project management, etc.

Another current trend among companies implementing project activities in the world is the use of an organizational model that involves self-management. Self-managed organizations are a separate direction in management, the task of developing a project management methodology for them is

relevant. Such a task becomes even more relevant in the context of a cross-cultural environment of projects that will be implemented by self-managed organizations. In the context of the determined relevance and practical value of the task of developing a syncretic methodology, in this article, the task of researching self-managed organizations and developing a syncretic methodology for them is set.

The task of researching self-managed organizations and developing a syncretic methodology for them is set. The relevance of the task is justified. An example of the application of syncretic methodology for restoration projects is illustrated. A review of the literature was carried out, based on the results of which the research on the construction of corporate project management methodologies was analyzed, in particular, based on the combination of several approaches. The purpose and objectives of the research are formulated. The main features of self-managed organizations are defined. A model of the management system of a self-managed organization is proposed. The elements of the model are characterized. The model offers four types of feedback - positive feedback inside, positive feedback outside, negative feedback inside, negative feedback outside. Also, three types of analyzers are proposed within the model - external impact analyzer, internal impact analyzer, smart analyzer of impacts synergism. Conceptual model of development projects management in self-managed organizations by syncretic methodology is proposed. The conceptual model is formulated in a plural form. The elements of the model are characterized.

Syncretic methodology is defined as the most important element of the model. The main distinguishing feature of the syncretic methodology is determined - the use of separate methodologies by individual subsystems of the project without mixing such methodologies. Conceptual model of syncretic methodology is proposed. The main element of such a model can be considered interfaces that transform information from input methodologies, their models and methods, into a conditionally universal form, for the interpretation of control influences through the same interfaces back to projects from the syncretic control system. The task of optimizing the syncretic methodology of managing development projects of self-managed organizations has been formulated.

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