

Values Spiral Development Method in the Implementation of Digitalization Projects in Syncretic Methodology

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ABSTRACT The article is devoted to the formulation of the method of spiral development of values in the implementation of digitalization projects of self-managed organizations, which was developed within the syncretic methodology of project management. The application of the proposed method is considered in the field of infrastructure restoration projects of Ukraine. A scientific problem regarding the availability of a project management methodology that meets modern challenges has been formulated. The gap between the practical needs of project-oriented organizations in a new unique methodology and the availability of established standards for solving typical project management tasks is revealed. A review of literary sources was carried out, modern project management trends were highlighted, including: increasing complexity of modern corporate project management methodologies, application of value-oriented management approaches, models of self-managed teams. The principles of value-oriented management for infrastructure restoration projects implemented by self-managed organizations within the syncretic methodology have been formulated. The method of values spiral development of a project-oriented organization, which uses models of self-management, through the implementation of digitalization projects within the syncretic methodology, is proposed. Within the scope of the method: a value model for digitalization projects of self-managed organizations is proposed; the concept of "stellarator project" is introduced, the definition of such a project is given. The results of the approbation of the method in a project-oriented organization working in the field of infrastructure restoration of Ukraine are presented and analyzed. Areas of improvement of the project-oriented activities of the specified organization have been determined. A SWOT analysis of the proposed method was carried out. Conclusions based on the research are formulated, prospects for further research in the chosen direction are outlined.

KEYWORDS digitalization project, program and project management; value approach; syncretic methodology, self-managed organizations.

I. INTRODUCTION

THE development of the scientific direction of project management led to the emergence of standards that form the basis of the corporate methodology of project management in project-oriented and project-managed organizations. At the same time, modern conditions for the implementation of projects in Ukraine, in particular infrastructure restoration projects, are implemented in unique conditions. Among such conditions are war, ongoing destruction, an extremely high degree of uncertainty in the project environment, the involvement of many participants with different management cultures in restoration projects, etc. The priority of infrastructure restoration projects of Ukraine is emphasized by the country's leadership [1], therefore the task of creating an effective methodology for managing restoration projects and

building an effective management system for such projects on its basis is of high relevance and significant practical value.

Thus, there is a gap between the practical needs of project-oriented organizations for a new unique methodology that would meet the set of modern challenges - and the presence of established standards and/or their combinations, which are mostly aimed at solving typical project management problems.

The authors put forward a scientific hypothesis that the syncretic methodology of project management, which uses, in particular, a value approach, is able to increase the efficiency of the implementation of projects and portfolios of infrastructure restoration projects.

Within the framework of the study of this hypothesis, the authors conducted a theoretical study, the results of which resulted in the method of values spiral development through the

implementation of self-managed organizations digitalization projects in syncretic methodology, which is presented in this article. Next, the method underwent practical testing during implementation into the infrastructure restoration project management system. Elements of research on the implementation of the proposed method are also presented.

It is also important to emphasize that digitalization projects are an integral and mandatory component of the activity of a modern project-oriented organization. Existence in a rapidly digitizing world puts forward demands for accelerated digitization for project-oriented organizations. And therefore, the type of projects considered in this article is also relevant.

II. LITERATURE REVIEW

The value-oriented approach, which is one of the leading trends in modern management systems, enriched project management thanks to the release of the P2M (Program and Project Management for enterprise innovation) standard, the development of which, in turn, took place already in its third edition [2]. The definition of a project as an "obligation to create value" turned the industry into a value dimension and gave impetus to further research in this direction. Among these, it is worth noting works [3, 4], in which value-oriented management is extended to organizational models for a certain type of project, which can be qualified as a digitalization project (reengineering). Research [5] generally develops a value approach to the level of methodology in the field of project and program management, provides a set of models and methods within the value-oriented methodology for solving a certain class of project management problems. Other researchers [6] consider the value approach and value-oriented management as a key to the successful development of a project-oriented organization, in particular in combination with creative models and methods. Therefore, it can be noted that the value dimension is now an integral part of the modern methodology of project and program management in project-oriented and project-managed organizations.

The task of selecting a project management methodology that would be adequate to the conditions of operation of a project-oriented organization was solved by many researchers. A classic approach to building corporate project management systems should be considered the one when a project-oriented company takes an established standard as a basis. As such a standard, before the advent of the Agile methodology, the PMBOK standard of the American Project Management Institute (PMI) [7] or, in IT-oriented companies, the British standard PRINCE2 [8] was most often used. Also, after 2012, companies could focus on the project management standard of the ISO organization [9], the bonus of which is laying the foundation for simplified obtaining of the corresponding ISO certificate. However, project-oriented companies, when creating their own approach, could also rely on generalizing works of project management researchers [10, 11].

However, the infiltration of the Agile methodology [12], which appeared in 2001, into the classic project management, as well as the models, methods and concepts of the IT world in general, changed the approaches to building methodologies of project-oriented organizations. In particular, as a new dimension of project management methodologies, the dimension of knowledge bases appeared, which should accumulate the best experience of previous project activities for use in current projects. Relevant studies [13, 14, 26] offer models and methods of knowledge management in projects.

The development of the combination of the IT component and the methodological component in project management led to the emergence of models and appropriate tools for choosing the best methodology for project management of the organization, according to its level of maturity in project management [15].

The appearance of the organizational model of self-managed teams should be noted as a separate significant trend of modern management systems. From the model of "turquoise organizations" as the next level of evolution of organizational systems and teams [16], this concept was developed to models and methods of holacratic management [17, 18]. The following are the main features of models and methods of self-management:

- Absence of formal hierarchy, horizontal connections, dynamic leadership;
- Initiative of team members, independent assumption of responsibility;
- Self-determination of tasks, ways of their implementation and motivation based on the results of their implementation.

Further, the authors [19, 20] proposed a special approach to solving the problems of project and program management in modern conditions, taking into account the leading trends of the industry – a syncretic project management methodology that can be applied, in particular, in self-managed organizations. Within the framework of the proposed approach, the principle of syncretism has been developed, which consists in the combination of elements (for example, projects) in one management system (for example, in a portfolio of projects), each of which is guided by its own (may be different) management methodology. The applied application of the syncretic methodology is considered by the authors in connection with infrastructure restoration projects of Ukraine [20].

Among the studies dealing with related topics, it is worth including, for example [21], where models and methods of managing project portfolios are proposed in the form of knowledge bases or a holistic methodology. However, in this study, the issues of syncretic coexistence of different methodologies within one management system are not considered enough. In addition, the issue of infrastructure restoration projects, which had not yet arisen at the time of publication (this publication was made before the beginning of the full-scale aggression of the Russian Federation against Ukraine), is not considered.

However, a number of other scientific studies [22-25] are devoted to infrastructure restoration projects and models and methods of managing such projects [22-25], which, in particular, consider new modern models, methods and principles for managing project portfolios in the field of road restoration [22], models of infrastructure prioritization projects submitted for consideration regarding the allocation of funding [23, 24], the organizational aspect and relevant models for the management system of infrastructure projects and programs considered within each phase of such projects [25], etc.

However, in these studies, the issue of using syncretic methodology to manage infrastructure restoration projects, in which self-managed organizations could participate, is almost not considered.

Therefore, the topic of this study, which combines a value approach, a syncretic methodology and the subject area of infrastructure restoration projects in Ukraine, is relevant. And

the proposed method can be considered as potentially containing scientific novelty.

III. MATERIAL AND METHODS

Value-oriented management within syncretic methodology should be implemented through appropriate models and methods. The basis of such models and methods can be, in particular, the principles of value-oriented management. We formulate the following principles for infrastructure restoration projects implemented by self-managed organizations within the syncretic methodology.

In this context, we propose the following principles:

- The principle of the necessary formalization of the list of current digitalization projects by a project-oriented company;
- The principle of rating such projects according to the degree of their value for a project-oriented organization with the corresponding definition of the indicator of such value according to a certain model;
- Implementation of dual projects (integration of business projects with digitalization projects) - for example, organization digitalization projects together with infrastructure restoration projects (within such projects);
- The principle of managing dual values when implementing dual projects;
- The principle of focusing on achieving synergism when combining regular (business) projects and digitalization projects;
- The principle of self-management in the work of project teams implementing dual projects of a self-managed organization;
- Involvement of each member of the project team in achieving the values of dual projects and improving the ways of such achievement.

Based on the above principles, we will propose a method of spiral development of the values of a project-oriented organization, which uses self-management models, by implementing digitalization projects within the syncretic methodology. The steps of the method are given below.

The research methodology can be described as follows. Data collection was carried out among project executors using the interview method. General scientific methods of analysis and synthesis were used for data processing. The method of expert groups was used to evaluate the projects. Software products of Microsoft's Office 365 ecosystem were used as an IT tool for data processing. Some subjectivity that may be inherent in expert judgments (which can be identified as a limitation of the methodology) was minimized by processing expert information. In particular, due to the selection of experts to the expert group through the procedure of complex evaluation (cross-evaluation, self-evaluation, evaluation of previous experience), calculation of concordance of evaluations, rejection of extreme evaluations, etc.

A. ANALYSIS OF THE STATE OF THE PROJECT-ORIENTED ORGANIZATION

In order to identify the state of a project-oriented organization and better positioning of digitalization projects, the main indicators characterizing the organization's activity should be analytically determined. Among such indicators, the following should be highlighted:

- Dynamics of the client base (percentage of decrease/increase in the total number of clients, percentage of decrease/increase in the number of regular clients, etc. over the last several periods of time);
- Dynamics of the potential client base (demographic indicator of the variability of the population in the locations where the organization is represented);
- Dynamics of project implementation in terms of quantitative and value indicators during the last several periods of time;
- Earnings dynamics over the last several time periods (possible year-to-year, month-to-month comparison with highlighting of seasonality, if present, etc.);
- Dynamics of specific profitability of a project-oriented organization (per employee);
- Dynamics of absolute and specific costs of a project-oriented organization (per employee);
- Personnel dynamics – change in the total number of personnel, the ratio of personnel involved in operational and project activities, the number of project teams, etc.

The indicated indicators should be the basis for prioritization of digitalization projects, as well as even for their identification, which should take place in the next step of this method.

At the first step of the method, the current value of the selected indicators characterizing the state of the project-oriented organization is established. It is also desirable to set their target values for several periods of time (or turns of the development spiral) for further evaluation of the development dynamics of a project-oriented organization (at steps 7 and 8 of this method). We also consider it expedient to include such indicators and their target values for several subsequent periods in the development strategy of a project-oriented organization.

B. IDENTIFICATION OF DIGITALIZATION PROJECTS

Digitalization projects are usually carried out in parallel with the main activities of a project-oriented organization and are aimed at ensuring a greater level of its institutional capacity, achieving a higher level of technological maturity in the field of project management, programs and project portfolios, etc.

We identify the main directions of implementation of digitalization projects in modern conditions, excluding traditional marketing and advertising projects as a separate class that requires the competences of the corresponding direction and separate consideration. In particular, we will highlight the following possible classes of digitalization projects:

- Implementation of information systems and technologies (digitalization projects);
- Personnel development projects, in particular competences in subject areas and/or in the field of IT project management tools, programs and project portfolios management tools, competences in IT for teamwork, etc.;
- Projects to achieve a confirmed level of the management system, for example, process engineering (using specialized IT) and further certification of processes according to ISO 9000;
- Project management system development projects are self-valued or aimed at obtaining a confirmed level of maturity, for example, according to Harold Kerzner's PMMM model, IPMA Delta certification of the

International Project Management Association (IPMA), etc.;

- Projects of organizational improvement, implementation of new organizational models; an example of such models can be the model of self-management of project teams;
- Territorial expansion projects – opening of new offices, branches, representative offices in other locations, other regions, other countries and creation (expansion and integration) of the relevant IT infrastructure;
- Merger/acquisition projects with other companies, including formation of holding structures, consortia, etc. and creation (expansion and integration) of the relevant IT infrastructure.

A project-oriented organization should generate (identify) a list of digitalization projects for the current period (for example, a year). Such a list may exceed the organization's ability to implement them collectively, as they will be subjected to analysis, ranking and filtering in the future. After that, only a part of them should be recommended for implementation.

C. DETERMINATION OF THE VALUE MODEL AND RANKING OF DIGITALIZATION PROJECTS ACCORDING TO SUCH MODEL

The digitalization project should bring value to the project-oriented organization. However, any activity (especially project activity) can have a complex impact. And therefore, in the value model, an attempt should be made to take into account most of the parameters of such influence.

In view of the above, we will propose a value model for digitalization projects of self-managed organizations within the syncretic methodology of project management. Let us present such a model in the following form:

$$V^j = \mu^j \cdot (\sum_i a_i^j \cdot n_i^j), \quad (1)$$

where V^j – is the indicator of the multiplicative value of the j -th project, μ^j – is the synergy multiplier (1..10) for the j -th project, n_i^j – is the percentage (share) of the projected increase in the dynamics of the activity indicator of the project-oriented organization (an approximate list of such indicators is given on to the first step of this method), a_i^j – is the weight of such an indicator, and $\sum_i a_i^j = 1$ for each j -th project.

Also, a simple indicator can be proposed as a possible model of the digitalization project value. Namely, the percentage (which can, for example, be converted into points on the ten-point scale) of the key performance indicator growth of the project-oriented organization:

$$V^j = \left(\frac{C_{cur}^j}{C_{pre}^j} - 1 \right) \cdot X, \quad (2)$$

where V^j – is an indicator of the one-dimensional value of the j -th project, C_{cur}^j – is the current value of the measured efficiency indicator (for example, the number of customers, profit, etc. according to the list from the first step of this method), C_{pre}^j – is the value of the indicator in the previous period, which is the basis of comparison, X – Is the scaling factor, the maximum value of the assessment according to the selected scale ($X=10$ for a ten-point scale).

Therefore, according to one of the above models, digitalization projects will receive a rating of their value. This is necessary for their selection for dual projects, which, in turn, are subject to further evaluation at the fifth step of this method.

D. SELECTION OF THREE EXPERT GROUPS FOR ASSESSMENT

To evaluate digitalization projects, as well as dual projects in general, it is proposed to apply the method of expert groups. Moreover, the evaluation is proposed to be carried out by three groups of experts:

- The first group should be represented by members of the dual project team;
- The second group should be represented by the staff of the project-oriented organization, who do not participate in the project, but represent the middle and higher management of the organization;
- The third group should be composed of representatives of the expert environment of the subject field.

According to the evaluation model, the highest evaluation weight is proposed to be given to the first group, the lowest with the second group, and the average with the third group.

It is proposed to select experts (especially the second and third groups) based on their qualifications. Important competencies should be participation in project activities in general and in digitalization projects of project-oriented organizations in particular. At the same time, it is proposed to calculate the weight of each expert in each expert group based on the following coefficients:

- Work experience in projects of a certain subject area - can be calculated in the number of projects of a potential expert, assigned to the maximum number of projects of the expert with the best result in the group;
- Experience in digitalization projects of project-oriented organizations - can be calculated either in years or in the number of projects of a potential expert, assigned to the maximum number of projects (maximum duration of work in years) of the expert with the best result in the group;
- The level of qualification in project management, confirmed by relevant training or certification - can be calculated in the number of diplomas and certificates of a potential expert, assigned to the maximum number of diplomas and certificates of the expert who has the best result in the group.

The specified coefficients must be combined to obtain the weight of the expert, for example through their multiplication. Then their normalization can be carried out - bringing them to the dimension of 0..1. After that, within each group, re-normalization can be performed to ensure that the sum of the weights of each group of experts is equal to one.

E. DETERMINATION OF DUAL PROJECTS (STELLARATOR PROJECTS) FOR PRIORITY IMPLEMENTATION AT THE CURRENT TURN OF THE DEVELOPMENT SPIRAL

Within the syncretic methodology, in accordance with the principles identified above, it is proposed to combine two projects into one joint (dual) project - a business project related to the regular activities of a project-oriented organization, and a digitalization project. Examples of digitalization projects are given in the description of the second step of this method. As a

result of such a combination, the dual project achieves two types of goals - business goals and digitalization goals, as a result of the implementation of such projects, a synergistic effect can be obtained. And therefore, the authors see the need to define such dual projects in a special class of projects - stellarator projects.

Definition. A stellarator project is a dual project that combines a regular project, which is usually carried out by a project-oriented organization within the main direction of its activity, and a digitalization project aimed at increasing the level of institutional capacity of a project-oriented organization. The purpose of such projects (stellarators) is to obtain a synergistic effect from the combination of business projects and digitalization projects and to create the foundation for a successful and long-term future existence in competitive conditions.

The name of the projects realizes an analogy with modern developments in the field of nuclear physics, where a relatively new type of thermonuclear reactors - stellarators, with the help of which it is possible to create conditions for controlled thermonuclear fusion - undergoes further development.

At this step of the method, stellarator projects should be defined in such a way that one part of such a project is one of the current business projects, the other is a digitalization project selected at the second step of this method, which at the third step received a rating according to the assessment of potential value. It is recommended to implement no more than three stellarator projects at the same time at each turn of the development spiral of a project-oriented organization. Therefore, digitalization projects that received the first three highest value ratings in the third step of this method should be encapsulated in such projects.

It can be assumed that with the long-term implementation of this method in a separate project-oriented organization, at the higher turns of the development spiral, a larger number of stellarator projects can be recommended for simultaneous implementation. Moreover, at a certain level of technological maturity in the field of application of the proposed method on the one hand, and project activity in general on the other, project-oriented organizations can switch to the implementation of exclusively stellarator projects. A separate study can be devoted to this model of project-oriented organizations development.

F. DETERMINATION OF THE CREATED VALUE INDICATOR ON THE CURRENT SPIRAL TURN

Within the proposed method, the stellarator projects selected by the project-oriented organization for feasibility analysis should be evaluated by expert groups.

$$V^j = 0.2 \cdot (\sum_i b_i^1 \cdot v_i^1) + 0.5 \cdot (\sum_i b_i^2 \cdot v_i^2) + 0.3 \cdot (\sum_i b_i^3 \cdot v_i^3), \tag{3}$$

where V^j – is the weighted assessment of the value of the stellarator project by three expert groups, b_i^1, b_i^2, b_i^3 – is the weighting coefficients (weight) of the experts of each expert group, the first, second and third, respectively, v_i^1, v_i^2, v_i^3 – is the assessment given to the j -th project by each expert from the first, second and third expert groups, respectively, 0.2, 0.5 and 0.3 – the weight of the assessment of the first, second and third expert groups, respectively, in the overall estimation of the value of the j -th project.

The proposed weighting factors are recommendations. Their choice is based on the assumption of a slightly lower weight of the project team's assessment (due to interest) and external experts (lack of information). Instead, the view "from the side" inside the organization is probably the most important, which was reflected in the greater weight of the experts of the organization where the dual project is implemented.

To unify the evaluation system, it is necessary to use the same evaluation scale by each expert group. Harington's scale (classical ten-point scale) appears to be the most adequate, as it is the most familiar.

Regarding the weight of the assessment of each expert group, the recommended weight values (0.2, 0.5 and 0.3 in formula 3) can be adjusted in each specific project. At the same time, the self-managed project management team can be the initiator of such an adjustment. According to the principle of self-management, the initiative can be put forward by any member of the team, the decision on specific weight values must be taken collegially. In this case, it is considered appropriate to use a method similar to Scrum Poker to determine specific values, which will eventually be agreed upon by the team based on the results of several iterations.

Thus, in order to choose two stellarator projects for implementation, it is advisable to analyze at least four such projects. Then two of them, which receive higher values of the weighted assessment of values, can be recommended for implementation.

In the future, the implementation of the selected stellarator projects should take place. To ensure the required dynamics of this method and taking into account the speed of changes in the surrounding project environment (which becomes especially unpredictable during war), the recommended planned duration of stellarator projects can be considered to be a period of up to one year.

G. RESULTS ANALYSIS OF THE CURRENT SPIRAL TURN

Based on the results of the implementation of the first six steps of this method, an analysis of the progress achieved by the project-oriented organization on the current turn of the spiral, which has reached its end, should be carried out. This should be preceded by the completion of all stellarator projects started at this turn of the development spiral of a project-oriented organization. At the same time, it is worth emphasizing that the spiral of development is carried out thanks to the implementation of stellarator projects.

At this step, the target values of the state indicators of the project-oriented organization selected at the first step of this method are compared.

Based on the results of such a comparison, the prerequisites for the transition to a new round of the development spiral should be formed. In fact, after this step, the method cycle (next) is completed, and the implementation of the method returns to the first step - to the beginning of the cycle.

As a result of this step, the following conclusions can be formulated (in particular, but not limited to):

- Regarding sufficient or insufficient dynamics of target indicators, as a result of which certain types of digitalization projects may be recommended for the next round of the development spiral;
- Regarding the redundancy or insufficiency of indicators of the state of the project-oriented organization, selected

at the current turn of the development spiral, as a result of which the indicated set of indicators can be either reduced or supplemented;

- Regarding the revision of models and principles of formation of digitalization projects, which are included in stellarator projects, due to a possible change in the relevance of certain directions of development, etc.

Therefore, the analytics that will be formulated at this step will determine the adjustment of the knowledge base of the project-oriented organization before the next round of the development spiral.

H. ANALYSIS OF THE PERIODIC REVIEW RESULTS, ADJUSTMENT OF MODELS, COMPLETION OF THE KNOWLEDGE BASE

At the end of a certain period, defined by the strategy of the project-oriented organization as a period for reviewing strategic indicators, an analysis of the results obtained during this period should take place. During the period of strategic review, there are usually several turns of the values development spiral.

Based on the results of the analysis of the reporting period, conclusions should be drawn both regarding the current state of the project-oriented organization and the results of its development. In the context of the analysis of the achieved level of development, models, methods and approaches to the implementation of the turns of the development spiral may be adjusted for the next reporting period. In particular, such conclusions may refer to the following:

- Successful application of syncretic methodology, which may consist in evaluating the possibilities of applying own project management methodology of all project teams participating in the implementation of a set of projects, as well as the effectiveness of interaction between such projects at the level of corporate methodology;
- Successful application of self-management models, effectiveness of project teams, in particular in comparison with hierarchical teams; to evaluate the indicator, you can apply formal criteria regarding differences in time, cost, and labour costs of project participants for the implementation of similar tasks;
- Regulation of the frequency of implementation of development spirals, which can be revised, in particular, the period of implementation of development spiral turns can be reasonably reduced due to changes in the surrounding project environment; an example of such changes can be the state's requirement to accelerate the implementation of infrastructure restoration projects;
- Revising the development strategy in response to emerging challenges; review of models and methods of project management in particular and management of the development of a project-oriented organization in general;
- Changes in organizational management models and project management teams; the need for such changes may be based on the analysis of KPI indicators of both individual members of project teams and teams as a whole.

This step of the method can be compared to the "retrospective of retrospectives" artifact used in the Scrum method of the Agile project management methodology. This

artifact is used to adjust project review periods, so the analogy is valid. In addition, the indicated step of this method can use separate models and techniques from the "retrospective of retrospective" model.

An important element of this step of the method is filling the knowledge base of the project-oriented organization, in particular with regard to the above-mentioned indicators. The knowledge base is a convenient tool for continuous improvement of subsequent projects that will be managed by a project-oriented organization. In this way, constant development is ensured, a confident upward movement to the next models of technological maturity, which will provide the project-oriented company with proactivity, flexibility, efficiency, and an increase in reputation.

Therefore, the method of values spiral development of a project-oriented organization in general can be implemented continuously throughout its entire life cycle. Termination of method implementation is recommended only at this step. The organizational model for the implementation of the step can be joint development sessions (JAD-sessions), during which there is a periodic review of the strategy of the project-oriented organization.

IV. RESULTS

The method was tested in a project-oriented organization working in the field of infrastructure restoration in Ukraine (hereinafter referred to as Company 1). The first significant feature of Company 1 is working with many contractors, each of which has its own project management methodology. The second significant feature is that Company 1 used elements of self-management. At least a few recent projects have been led by self-directed teams. And therefore, Company 1 has essential prerequisites for implementing a syncretic project management methodology for self-managed organizations. The only missing artifact in terms of the method under study was that Company 1 had not previously used value-based management, but planned to implement it in the future. Therefore, the implementation of the researched method was aimed, in particular, at the beginning of the application of such management in line with modern project management trends and in accordance with the strategic plan of Company 1.

It is worth noting that Company 1 was aware of the importance of digitization projects as those that contribute to the multi-vector development of the company, allow the use of modern flexible IT tools, and increase not only the ability to more effectively implement projects, but also overall competitiveness. Eight digitalization projects (step 2 of the proposed method) were identified for consideration regarding the possibility of implementation in the specified organization. According to the results of step 3 of the proposed method, the following four projects received the highest value estimates, which thus received a recommendation for inclusion in the stellarator projects:

- *Project 1. Engineering, modeling and optimization of organizational processes.* This digitalization project provides a description of all processes: the main supporting and IT processes. It has two main goals – improving processes (reducing their duration, cost, labor costs for each process) to ensure an increase in the efficiency of organizations, and therefore competitiveness, as well as passing international certification of the organization (for example, according to the ISO 9000 standard) to ensure better competitive

conditions when entering international markets. The project includes the selection of a notation and an IT tool for process modeling, direct modeling, process optimization, and the implementation of optimized processes in the activities of a project-oriented organization;

- **Project 2. Implementation of the document circulation system.** It involves the transfer of most document communications to the Microsoft Corporation's Office 365 ecosystem. In particular, it is planned to use Word 365 for document preparation, Excel 365 for calculations, Power Point 365 for presentation preparation, and Outlook 365 for correspondence. At the same time, it is planned to store documents in the OneDrive cloud resource. To systematize documents, it is planned to structure the data storage on OneDrive;
- **Project 3. Implementation of an IT tool for calendar and network planning to monitor all projects from the organization's project portfolio.** According to the results of the preliminary analysis before the implementation, the Project Online tool was chosen to solve the specified tasks. An additional argument for such a choice was that this product belongs to the Office 365 ecosystem, which is planned for implementation in Company 1. It is also important that Project Online allows you to manage project portfolios, which is practically valuable in the context of the specified project-oriented organization.
- **Project 4. Development and implementation of a system of management dashboards to provide the top management of the organization with daily updated analytics on projects.** According to the selected ecosystem, the next logical stage of its development in the direction of forming project analytics is the introduction of the Power BI product (belongs to the Office 365 ecosystem). With the use of the specified tool, it is possible to set up the collection, updating and visualization of aggregated project information. At the same time, it is important that dashboards can be configured both for an individual member of the project management team and for project managers, as well as generalized dashboards for the top management of a project-oriented organization. The mentioned project requires significant organizational, management and informational efforts, but it is potentially a step towards significantly increasing the effectiveness of project monitoring, and therefore project activity as a whole.

For further implementation of the method of values spiral development, three groups of experts with 5 people in each group were selected. In particular, five members of the project team, five representatives of the middle management of Company 1 (at the level of heads of departments not directly involved in project management teams), and five representatives of the top management of the company that is a partner of Company 1.

The combination of these projects with the main projects of the organization had to be carried out after the evaluation of the digitalization projects.

The results of the expert assessment are presented in Tables 1-3. Figure 1 presents the generalized assessment of each of the four stellarator projects by each expert group. Also, this figure

shows the indicator of the created value on the current turn of the spiral, which is calculated according to formula 3.

Table 1. Evaluation of stellarator projects by first expert group (project team)

Experts	Ra-ting	Expert estimates of four stellarator projects – absolute (E) and weighted (G)							
		E 1	G 1	E 2	G 2	E 3	G 3	E 4	G 4
Expert 1	0,18	8	1,44	6	1,08	9	1,62	7	1,26
Expert 2	0,21	8	1,68	7	1,47	9	1,89	7	1,47
Expert 3	0,23	7	1,61	7	1,61	8	1,84	6	1,38
Expert 4	0,19	9	1,71	9	1,71	10	1,9	8	1,52
Expert 5	0,19	7	1,33	6	1,14	8	1,52	9	1,71
Σ	1,00		7,77		7,01		8,77		7,34

It is worth noting that the evaluation of stellarator projects is excellent in all three groups. In particular, in the first group (represented by members of the project teams), the ratings are generally higher. Representatives of top management rate projects the lowest. The scores of the third group are generally higher than those of the second group, but lower than those of the first group.

You can also pay attention to proposals for the implementation of two stellarator projects (according to the highest weighted estimate). The first expert group recommends the first and third projects for implementation, while the second and third groups recommend the third and fourth (highlighted with a gray background in the figures). At the same time, it is clear that the indicator of the created value is greater precisely in the third and fourth projects. A consensus was thus reached only in relation to the third project.

Table 2. Evaluation of stellarator projects by second expert group (middle management)

Experts	Ra-ting	Expert estimates of four stellarator projects – absolute (E) and weighted (G)							
		E 1	G 1	E 2	G 2	E 3	G 3	E 4	G 4
Expert 1	0,20	5	1	5	1	6	1,2	6	1,2
Expert 2	0,18	4	0,72	3	0,54	4	0,72	5	0,9
Expert 3	0,19	6	1,14	6	1,14	6	1,14	6	1,14
Expert 4	0,22	3	0,66	2	0,44	4	0,88	3	0,66
Expert 5	0,21	5	1,05	5	1,05	4	0,84	5	1,05
Σ	1,00		4,57		4,17		4,78		4,95

It should be remembered that the proposed model is a decision support model. The head of a project-oriented organization (in administrative teams and organizations) or a self-managed team (in organizations that partially or fully practice self-managed management) can either adhere to the recommendations provided by this model, or simply take them into account as an additional argument when making a final decision.

Table 3. Evaluation of stellarator projects by third expert group (stakeholders)

Experts	Ra-ting	Expert estimates of four stellarator projects – absolute (E) and weighted (G)							
		E 1	G 1	E 2	G 2	E 3	G 3	E 4	G 4
Expert 1	0,23	6	1,38	6	1,38	7	1,61	7	1,61
Expert 2	0,21	5	1,05	6	1,26	6	1,26	7	1,47
Expert 3	0,17	7	1,19	6	1,02	8	1,36	8	1,36
Expert 4	0,20	5	1	5	1	5	1	6	1,2
Expert 5	0,19	6	1,14	7	1,33	7	1,33	6	1,14
Σ	1,00		5,76		5,99		6,56		6,78

Based on the results of the implementation of the method of values spiral development, directions for improving the

project-oriented activities of Company 1 were determined. Among such directions, in particular, the following were identified:

- Due to the fact that insufficient maturity and formalization of project management processes was found, it is possible to recommend the implementation of the project of engineering, modeling and optimization of processes as relevant for the next turn of the development spiral of Company 1. Such project should involve both specialists of Company 1, who participate in project activities, and external experts who have significant experience in the implementation of project management;
- Expanding knowledge and forming a knowledge base of value-oriented management in Company 1, as a certain lack of understanding of value approaches was observed among the organization's employees; for this purpose, training (upgrading of qualifications) of project teams in the field of value-oriented management can be organized;
- Distribution of the self-management model to other projects and implementation of the specified models in all projects of Company 1; such distribution should take place using the best experience of teams that have worked out self-management models for a long time or in several projects (through benchmarking);
- Inclusion in stellarator projects is appropriate for major projects of short duration - up to one year; usually, infrastructure restoration projects last longer, in this case, the digitalization project can be joined to the main project not at the beginning of the main project implementation, but in the middle phases of the life cycle (the creation of a stellarator project while the main project is in the completion phase is not advisable).
- Improvement of the work of the project office of Company 1, since in order to ensure greater efficiency from the implementation of syncretic management, it is necessary that the processing of the results from the projects that make up the project portfolio of the project-oriented organization, and the information exchange between such projects take place more quickly; for this, it is necessary that at the level of the project management office, an effective model of interpretation of the models and methods of each separate methodology is implemented - in the models and methods of each other methodology used by the projects of the portfolio.

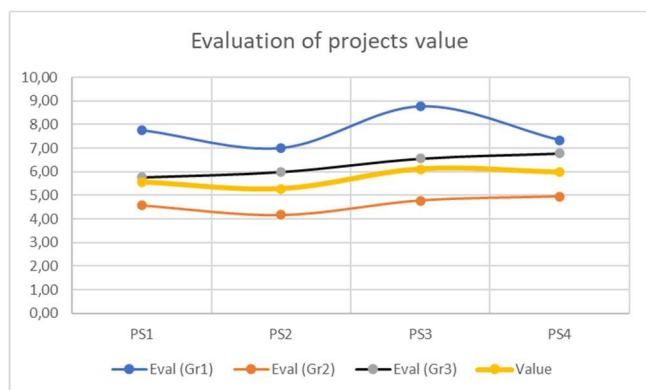


Figure 1. Evaluation of the value created by stellarator projects by the method of expert groups.

In general, working on the specified directions for improving the project-oriented activities of Company 1 can potentially increase the level of maturity of the company in the field of project management, which will provide better indicators of their implementation in terms of time, cost, use of labor resources and achievement of values by all stakeholders of the company's projects.

SWOT ANALYSIS

Let's conduct a SWOT analysis of the proposed method of values spiral development for use in stellarator projects (infrastructure restoration projects combined with digitalization projects) by self-managed organizations implementing syncretic management. Let's highlight their strengths, weaknesses, opportunities arising from their application, and threats that may arise.

Strengths.

S1. Creating a value dimension in the activities of project-oriented organizations enriches the arsenal of management models and methods in their corporate project management system. This makes it more flexible, adaptable, meeting the requirements of modern times.

S2. The evaluation of values that occurs within the method allows taking into account the values of stakeholders and, thus, managing the achievement of such values and ensuring that project results match their expectations more accurately.

S3. The use of the method by self-managed organizations allows you to adjust its individual parameters directly during its application, thus increasing its effectiveness and ensuring adaptability to the conditions of a specific project-oriented organization.

Weaknesses.

W1. Insufficient completeness of scientific developments in this direction, which is at the junction of value-oriented management, syncretic methodology, organizational and management models of self-managed project teams.

W2. Insufficient level of practical approbation of the proposed method of values spiral development within the corporate management systems of project-oriented organizations guided by syncretic methodology.

W3. Methodological complexity of the method, which makes it debatable for implementation by small self-managed teams and project-oriented organizations.

Opportunities.

O1. The possibility of adapting (tailoring) the method of values spiral development to the conditions of a project-oriented organization and its projects, thanks to the creative efforts of a self-managed team and/or thanks to the use of elements of artificial intelligence.

O2. The ability to quickly react and predict (as a result of the team's situationally determined application of either a reactive or proactive principle) in infrastructure restoration projects driven by different methodologies, through value management. Thanks to this, the manageability of projects will improve, and therefore their effectiveness, as well as the ability to adhere to project constraints to a greater extent and satisfy the expectations of stakeholders, and ensure that they receive its target values.

O3. The possibility of increasing the abilities, skills and general competence of project management participants in a self-managed organization thanks to the use of the method within the syncretic methodology. What will provide the foundation for increasing the efficiency of the management

system for each subsequent project (portfolio) of a project-oriented organization.

Threats.

T1. The threat of inaccuracies in the management system and methodological confusion in case of choosing an inadequate model of values (inadequate elements of the model) due to an incorrect assessment of the external and internal environment and corresponding changes in the projects of a self-managed project-oriented organization.

T2. The method is based on expert assessments, and therefore contains a subjective factor in the assessment. In the case of inadequate processing of expert information, the threat of inaccuracy of expert assessments regarding values or their weight will increase, as a result of which the effectiveness of the method of values spiral development in the syncretic methodology will be reduced, which may lead to the refusal of its use and/or the withdrawal of restoration projects implemented by self-managed organizations, beyond the limits specified by the customers.

T3. The threat of reducing the effectiveness of a project-oriented organization due to incorrect or unprofessional implementation of the method of values spiral development. As a result, projects of a project-oriented organization may be delayed, situational competitiveness may decrease, and the organization may suffer reputational losses.

A summary of the SWOT analysis is given in Table 1.

Table 4. Summary of SWOT analysis

Strengths	Weakness
<ul style="list-style-type: none"> - Creating a value dimension in the management system - Managing the achievement of stakeholder values - Adaptability of the method of values spiral development 	<ul style="list-style-type: none"> - Insufficient completeness of scientific research - Insufficient level of practical approval - Methodological complexity of the method
Opportunity	Threats
<ul style="list-style-type: none"> - Possibility of adaptation (tailoring) of the method - The possibility of improving project management - The possibility of increasing the competence of teams 	<ul style="list-style-type: none"> - Threat of methodological confusion and inaccuracies - Threat of inadequate processing of expert information - The threat of reducing the effectiveness of the organization

According to the results of the SWOT analysis, it can be concluded that when using the possibilities of the proposed method of values spiral development in stellarator projects (which are implemented by self-managed organizations using syncretic methodology), its threats can be overcome, and its advantages outweigh the corresponding disadvantages.

VI. CONCLUSIONS

The field of infrastructure restoration is a relatively new direction of application of scientific and practical efforts of specialists in Ukraine. The destruction that has already been caused and will continue to be caused by the Russian Federation as part of its aggression against Ukraine requires the implementation of restoration projects. Thus, due to the novelty and corresponding inadequacy of scientific developments in this direction, the development of relevant methodological developments can be considered relevant.

This article presented the principles of value-oriented management for infrastructure restoration projects implemented by self-managed organizations within the syncretic methodology. On the basis of these principles, the

method of values spiral development is proposed and explained, the results of its approbation are also given, and the corresponding SWOT analysis is carried out.

As a result of the conducted research, it can be concluded that with the correct and scientifically supported introduction into the activity of project-oriented organizations, their institutional capacity to implement complex projects with many participants can improve, which can lead to an increase in the efficiency of the management system, an increase in the competitiveness of a project-oriented organization, improving the implementation of infrastructure restoration projects in Ukraine. And this, in the end, will contribute to the approaching victory of Ukraine.

According to the results of the analysis of the presented material, vectors of further research in the chosen direction can be formulated, including:

- Development of methods for developing organizational maturity of self-managed organizations in the context of using syncretic project management methodology, based on the application of models and methods of syncretism;
- Creation of principles, approaches or mechanisms for choosing models of the organizational structure of interaction of self-managed organizations with the external and internal environment of digitalization projects, based on syncretic approaches;
- Development of interfaces models between methodologies that use separate parts of stellarator projects, for the correct interpretation of such methodologies at the level of the project management system of a project-oriented organization;
- Deeper scientific study of stellarator projects, creation of a classification model for such projects and their further research;
- At a certain level of technological maturity in the field of application of the proposed method on the one hand, and project activity in general on the other, project-oriented organizations can switch to the implementation of exclusively stellarator projects. A methodological base (principles, models, methods) should be prepared to support such a transition to project-stellarator management;
- Development of models, methods and algorithms for the implementation of a complex of approaches (self-management, value management, syncretism) integrated by syncretic project management methodology into the activities of project-oriented organizations working on the implementation of infrastructure restoration projects.

The authors plan to carry out further research in the chosen direction, in particular in the field of digitalization projects and the development of relevant models, methods and IT tools.

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References

- [1] Decree of the President of Ukraine dated April 21, 2022, No. 266/2022 *Questions of the National Council for the Recovery of Ukraine from the Consequences of the War*. [Online]. Available at: <https://www.president.gov.ua/documents/2662022-42225>.
- [2] *P2M Bibelot (Overview of P2M Third Edition)*, Project Management Association of Japan (PMAJ), June 2017. [Online]. Available at: [https://www.pmaj.or.jp/ENG/p2m/p2m_guide/P2M_Bibelot\(All\)_R3.pdf](https://www.pmaj.or.jp/ENG/p2m/p2m_guide/P2M_Bibelot(All)_R3.pdf).
- [3] S. Bushuyev, A. Puziichuk, "Development organizational structure for value-oriented reengineering project of construction enterprises," *Proceedings of the 2021 IEEE 16th International Conference on Computer Sciences and Information Technologies (CSIT)*, Lviv, Ukraine, September 22-25, 2021, vol. 2, pp. 367-370. <https://doi.org/10.1109/CSIT52700.2021.9648758>.
- [4] D. Anderson, & L. A. Anderson, *Beyond Change Management: Advanced Strategies for Today's Transformational Leaders*, San Francisco: Jossey-Bass/Pfeiffer. <https://books.google.com/books?id=WbpH7p5qQ88C&printsec=frontcover&dq=beyond+change+management&hl=en&sa=X&ei=kEfzTpewMYKpiQLGz5S8Dg&ved=0CD0Q6AEwAA#v=onepage&q=beyond%20change%20management&f=false>.
- [5] J. Thomas, M. Mullaly, "Understanding the value of project management: First steps on an international investigation in search of value," *Project Management Journal*, 2007, vol. 38, no. 3, pp. 74-89. doi: <https://doi.org/10.1002/pmj.20007>.
- [6] T. Gillier, S. Hooge, G. Piat, "Framing value management for creative projects: An expansive perspective," *International Journal of Project Management*, vol. 33, issue 4, pp. 947-960, 2014. <https://doi.org/10.1016/j.ijproman.2014.11.002>.
- [7] *The Standard for Project Management and a Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, Seventh Edition. USA, Project Management Institute, 2021, 250 p.
- [8] PRINCE2® 7. *Managing Successful Projects. Global Best Practice*. PeopleCert, 2023, 347 p. ISBN 978-9925344604.
- [9] BS ISO 21500:2021. *Project, programme and portfolio management. Context and Concepts*, ISO, 2023, 32 p.
- [10] H. Kerzner, *Using the Project Management Maturity Model. Strategic Planning for Project Management*, Third Edition. Wiley, 2019, 321 p. <https://doi.org/10.1002/9781119559078>.
- [11] D. Guida, *When Grit is Not Enough: An Entrepreneur's Playbook for Taking Your Business to the Next Level*, River Grove Books, 2024, 320 p.
- [12] D. Rigby, S. Elk, S. Berez, *Doing Agile Right: Transformation without Chaos*, Harvard Business Review Press, 2020, 256 p.
- [13] P. Boudreau, *Applying Artificial Intelligence to Project Management*, Book. KDP Print US – Amazon Digital Services LLC, 2019, 184 p.
- [14] S. Orenga-Roglá and R. Chalmeta, "Methodology for the implementation of knowledge management systems 2.0," *Business & Information Systems Engineering*, Springer, vol. 61, issue 2, pp. 195-213, 2019. <https://doi.org/10.1007/s12599-017-0513-1>.
- [15] I. Kononenko, M. Kpodjedo, A. Morhun, & M. Oliynyk, "Information technology for choosing the project portfolio management approach and the optimal level of maturity of an organization," *Radioelectronic and Computer Systems*, no. 4, pp. 173-190, 2022. <https://doi.org/10.32620/reks.2022.4.14>.
- [16] F. Laloux, *Reinventing Organisations: A Guide to Creating Organisations Inspired by the Next Stage of Human Consciousness*, Nelson Parker, 2014, 382 p.
- [17] B. J. Robertson, *How are holacracy-powered organizations different?* Holacracy Foundation, 2020. [Online]. Available at: <https://www.holacracy.org/explore/why-practice-holacracy>.
- [18] S. Mamoli, "Holacracy for humans," *The InfoQ eMag*, issue 71, pp. 10-17, 2019. <https://doi.org/10.37544/1618-193X-2019-10-17>.
- [19] S. Bushuyev, A. Ivko, "Conceptual model of syncretic methodology data of development projects management for self-managed organizations," *Proceedings of the X International Scientific Conference "Information Technology and Implementation" (IT&I-2023)*. Kyiv, Ukraine, November 20-21, 2023, pp. 266-275. https://ceur-ws.org/Vol-3624/Paper_22.pdf.
- [20] A. Ivko, "Methods of methodologies hybridization in the management system of development projects of self-managed organizations," *Management of Development of Complex Systems*, issue 56, pp. 14-23, 2023. <https://doi.org/10.32347/2412-9933.2023.56.14-23>.
- [21] *The Standard for Portfolio Management. Fourth Edition*, Project Management Institute (PMI), Printed in the United States of America, 2017, 127 p. ISBN: 978-162825-197-5.
- [22] Y. Chen, G. Liu, T. Zhuang, "How to promote urban regeneration projects? An area-wide portfolio selection approach considering interaction effects and multiple objectives," *Environmental Impact Assessment Review*, vol. 103, 107283, 2023. <https://doi.org/10.1016/j.eiar.2023.107283>.
- [23] S. Hansen, A. Suryadibrata, S. Hansun, "Infrastructure project selection automation using non-structural fuzzy decision support system II," *Eastern-European Journal of Enterprise Technologies*, no. 3 (121), pp. 46-56, 2023. <https://doi.org/10.15587/1729-4061.2023.271822>.
- [24] S. Hansen, E. Too, T. Le, "Criteria to consider in selecting and prioritizing infrastructure projects," *MATEC Web of Conferences*, vol. 270, article 06004, 2019. doi: <https://doi.org/10.1051/mateconf/201927006004>.
- [25] S. Kramskyi, O. Zakharchenko, "Organization model of managing the stages of implementation of the infrastructures project and program," *Management of Development of Complex Systems*, vol. 52, pp. 28-34, 2022. <https://doi.org/10.32347/2412-9933.2022.52.28-34>.
- [26] S. Maslovskiy and A. Sachenko, "Adaptive test system of student knowledge based on neural networks," *Proceedings of the IEEE 8th International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS)*, Warsaw, Poland, 2015, pp. 940-944. <https://doi.org/10.1109/IDAACS.2015.7341442>.



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