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Method of Maximizing F-Synergistic Value in IT Development Projects for Self-Managed Organizations

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ABSTRACT The article is devoted to the formulation of the method of maximizing the F-synergistic value of IT development projects of a project-oriented organization, which was developed within the syncretic methodology of project management. The application of the proposed method is considered in the field of IT development projects of organizations involved in infrastructure restoration projects of Ukraine. The directions of scientific research in the field of value-oriented project management are analyzed. The previously unsolved part of the scientific problem is highlighted. Objects of value analysis in a project-oriented organization carrying out IT development were identified, among which stellarator projects were highlighted. A model for determining the value of a separate component of the system is presented. The concept of F-synergistic value is defined. Such a value is proposed to be calculated through the aggregate value of three clusters that create synergistic effects both within themselves (first-order value) and among themselves (second-order value). The clusters included: "IT + people" cluster, "projects + operational activity" cluster, "methodology + environment" cluster. Models for determining the value of a separate cluster and the aggregate F-synergistic value are proposed. Variations in the selection of weighting factors for evaluating value criteria are considered. Within the syncretic methodology, a method of maximizing the F-synergistic value of IT development of a project-oriented company is proposed. The model of 27 scenarios of the dynamics of the change of the multipliers of synergy of three clusters is presented. In the corresponding tables for each scenario, a hypothesis is put forward regarding the reasons for such dynamics for each scenario, as well as a model of further IT development of a project-oriented company in response to such reasons. According to the results of the development of the method of maximizing the F-synergistic value of IT development projects of a project-oriented organization guided by syncretic methodology, directions for improving the activities of such organizations were determined. An extended SWOT analysis of the proposed method was conducted. Conclusions based on the research are formulated, prospects for further research in the chosen direction are outlined.

KEYWORDS program and project management; value approach; syncretic methodology, F-synergistic value maximizing method, self-managed organizations.

I. INTRODUCTION

PROJECT activity in modern conditions in Ukraine is complicated by many factors. The main challenge remains the war that is ongoing because of the aggression of the russian federation, and in the conditions of which the accelerated restoration of Ukraine's infrastructure should take place. The locomotive of recovery projects is IT infrastructure and IT solutions that can simply and effectively support the implementation of recovery projects.

The Ukrainian Government paid a great attention to the issue of effective restoration [1, 2]. The methodological aspect of ensuring the implementation of infrastructure restoration projects is insufficiently researched. This, in particular, is evidenced by the research of the authors, who propose a syncretic methodology for the relevant projects [3]. The syncretic methodology is created in order to overcome the gap between the practical need for an effective methodological basis for the implementation of infrastructure restoration projects (on the one hand) and the insufficiency of scientific developments in the indicated direction (on the other hand).

In addition, it should be emphasized that one of the main objects of application of syncretic project management

methodology is the IT system of a project-oriented organization. Such an IT system should be integrated (support the implementation of most of the organization's processes) and, at the same time, help implement effective management of the organization's projects, programs, and project portfolios.

Within the hypothesis of improving the efficiency of infrastructure restoration projects due to the implementation of a syncretic project management methodology and value-oriented management in the context of the implementation of IT development projects of a component of project-oriented organizations, the F-synergistic value maximizing method is proposed, which is considered in this article.

II. LITERATURE REVIEW

The value-oriented approach, which is one of the leading modern trends in the management of projects and programs and project portfolios, has fundamentally changed the industry. As a result, even in the classic project management standards and methodologies, in their latest revisions, appropriate changes took place taking into account value management.

For example, the evolution of the most established classic standard in the field of project management PMBOK can be analyzed [4]. The first version of the standard was published in the form of separate articles more than thirty years ago, and only in the penultimate (at this time) sixth edition of the PMBOK do separate references to the value approach appear. In particular, in the field of knowledge regarding the involvement of interested parties in the project, taking into account their interests and managing the achievement of their goals in the project. Values are also mentioned as an object of management in the section of the standard on project success and benefit management [4]. However, in the latest, currently seventh edition of the PMBOK standard, this direction was significantly developed, the standard defines only two sections - on value management and on the principles of project management [5]. The section on managing values in projects (Value delivery) describes: the process of creating values; governance systems in the organization (in terms of created values); functions related to projects and the project environment in the same context; and also describes some considerations for product management from the point of view of the values it creates.

In a separate direction of PMI standardization related to portfolio management, in the current (fourth) edition of the relevant standard, the value-oriented approach is also sufficiently institutionalized [6]. In particular, of the six domains of portfolio management under consideration, one domain is dedicated to value management. It, in particular, considers models of portfolio management regarding negotiating expected value, maximizing value, assuring value, realizing value, measuring value, reporting value. It is also worth noting that in other portfolio management domains (portfolio strategic management, portfolio governance, portfolio capacity and capability management, portfolio stakeholder engagement, portfolio risk management) there is a reference to value management, all domains are considered in connection with it.

Other standards in the field of project management, as well as the works of leading scientists in the field, also reflect the corresponding trend. In particular, the standards of the international ISO standardization organization for project management at the conceptual [7] and instrumental [8] levels, the latest edition of the Prince2 standard [9], the P2M standard of the Japanese project management association PMAJ [10], which is generally the progenitor of the value approach in project and program management.

In general, the scientific works on value-oriented management reflect the several directions of research: 1) general methodological research, 2) application of the approach in specific projects with the development of relevant models and methods, 3) application of value management in high-tech IT projects companies.

The first direction, includes in-depth scientific research. That describes value-oriented management as one of the modern trends in the context of a much broader consideration of the project approach [11], conducts in-depth consideration of value-oriented management in one of the selected fields [12], or considers a complete set of models and methods within the project management methodology, which is focused on earned value project management [13].

In smaller-scale scientific works in this direction, the researched approach is considered for example to formation of synergism models in a separate type of project [14] and to differences between cost management and value management in project management [15].

The second direction can be selectively represented by works where the value approach is enriched with new models and methods in the context of territorial development projects within a project-oriented organization [16], approaches to ensuring sustainability and agility in project management that are important for infrastructure restoration projects [17], projects related to revealing the creative potential of project teams [18].

According to the results of the analysis of such works, it should be emphasized that each branch (and each type of project within the branch) requires profiling of models and methods of value-oriented management in relation to them, for which separate scientific studies are conducted.

Within the third direction, it is worth highlighting scientific works in which the value approach is applied in certain types of projects. In particular, new models and methods of value-oriented management have been developed for projects of high-tech enterprises [19, 20], taking into account the importance of such enterprises and the relevance of scientific research on increasing their efficiency.

Additionally, it is worth noting that the value-oriented approach corresponds well with the application in self-managed organizations, which is also one of the subjects of the authors' research. Models of self-management were formulated in work [21] in the context of describing the next level of organizational development in the model of "turquoise organizations". The trend of using individual elements of self-management, individual self-managed teams and fully self-managed organizations is gaining more and more relevance now. Therefore, the work of scientists regarding the models and methods of holacratic management, which are based on models of self-management and are their further development in the form of an appropriate methodology, are relevant. Thus, the work [22] provides general principles and approaches of holacratic management, while the work provides models of its application [23]. In the context of the researched infrastructure restoration projects, it is also worth taking into account and using the models and methods of the value approach formulated in the work [24] and can be aimed at increasing the efficiency of project activities. Also, in the authors' research, the syncretic methodology proposed for managing

infrastructure restoration projects included separate models of self-management, as well as a value approach [25]. Within this approach, in particular, the values spiral development method in the implementation of digitalization projects in syncretic methodology was proposed.

However, it is worth noting that in the studies described above, the scientific issues that will be covered in this article are not sufficiently considered. Namely, in a combination of the following elements – a value approach, the use of self-managed teams, syncretic methodology, the principle and model of synergism – the developed F-synergistic value maximizing method of the syncretic methodology of self-managed organizations IT development is proposed. The method will consider the impact of IT component development projects on both components of the activities of participants in infrastructure restoration projects - both project and operational activities of a project-oriented organization, that is, it will analyze them in a complex, which allows considering the synergistic effects of their interaction. Thus, the topic of this study can be considered relevant.

III. MATERIAL AND METHODS

The topic under consideration is related to the IT development of participants in infrastructure restoration projects, and is implemented within the syncretic project management methodology. Therefore, for its consideration, it is necessary to use the methods of the following scientific areas:

- Project and project portfolios management methodology;
- Project and project portfolios syncretic management methodology;
- Methodology of value-oriented management of projects and project portfolios;
- Models and methods of implementing self-management by project management teams;
- The principle of synergism and models for determining synergism, built on the basis of the use of this principle.

As research materials, the work on the management of projects and portfolios of infrastructure restoration projects, the implementation of which was overseen by the State Agency for Reconstruction and Development of Infrastructure of Ukraine (SARDI), was used.

On the basis of models and methods from the set of the given methodologies, we will offer the F-synergistic value maximizing method of self-managed organizations IT development within the syncretic methodology.

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. The subject area of the research was infrastructure restoration projects of Ukraine, the coordination of which implementation was entrusted to SARDI. Software products of Microsoft's Office 365 ecosystem were used as an IT tool for data processing.

A. DETERMINATION OF VALUE ANALYSIS COMPONENTS

Due to the complex nature of value as an assessment category, it is necessary to first determine the components that affect the IT development of a self-managed project-oriented organization. Each such component can carry a separate value, when combining such values, a synergistic effect can occur. So, among such components, we identify the following:

- specialists in project management information technologies;
- specialists in value-oriented project management in self-managed organizations
- self-managed models and methods of managing IT development projects;
- IT system of a project-oriented organization;
- Stellarator projects (were proposed in the study of the authors [25] and are defined as dual projects that combine a regular project, which is usually carried out by a project-oriented organization within the main direction of its activity, and a development project aimed at increasing the level of institutional capacity for project -oriented organization);
- adjusted processes of operational management in a project-oriented organization, which are carried out on the basis of the use of IT tools.
- adjusted project management processes in a project-oriented organization, which are carried out on the basis of the use of IT tools (project management processes and project portfolios).

The specified components are of a recommendatory nature and are used in the proposed method. However, it is worth noting that a comprehensive list of such components should be compiled by a project-oriented organization based on the proposed components, but taking into account the specifics of its own activity and its own project environment.

B. DETERMINATION OF INDIVIDUAL COMPONENTS VALUES

In order to determine the value of individual components, which will be combined into clusters in the future, it is proposed to involve five experts to carry out the assessment and obtain an expert assessment. Among such experts, the following are offered:

- top manager of the operational management vertical (as an option, CEO);
- top manager of the operational management vertical (as an option, the head of the PMO);
- a representative of the vertical of operational management at the level of the head of the division;
- a member of the project management team (preferably from the stellarator project);
- External expert on organizational development.

We present the model for determining the value of a separate component of the system in the following form:

$$v = \sum_1^5 (0{,}2 \cdot (\sum_i w_i \cdot p_i)), \qquad (1)$$

where v – is the value indicator determined for the i-th evaluation object by the expert group, p_i – is the performance indicator of the project-oriented organization that characterizes the evaluation object (or a component of the value analysis, the proposed list of such components is given above), w_i – is the weight of such an indicator, and $\sum_i w_i = 1$ for each evaluation object.

The equal weight of each indicator in the overall assessment may be changed in accordance with the variations formulated in the next subsection of this article.

In addition, the list of experts is also of a recommendatory, general nature, and is designed for use in the proposed method. For real IT development projects, such a list can be reviewed by the project team.

C. DETERMINATION OF F-SYNERGETIC VALUE

According to the results of the analysis of the components affecting the IT development of a self-managed project-oriented organization (such components were identified above), clusters of synergism were identified: "IT + people", "projects + operational activity", "methodology + environment". So, according to our assumption, synergism in a self-managed project-oriented organization that carries out IT development and operates within the syncretic methodology of project management can be created in the following clusters:

- due to the interaction of IT technologies and IT professionals who will work on such technologies ("IT + people" cluster);
- due to the interaction of the organization's project activity with its operational activity ("projects + operational activity" cluster);
- due to the interaction of the methodology and the ability to respond adequately to the challenges of the environment of the project-oriented organization ("methodology + environment" cluster).

We will get an assessment of each cluster using the method of expert groups, we will apply a weighted assessment model in the following form:

$$V^k = s^k \cdot ((\sum_j \sum_i w_{i,j}^{1,k} \cdot p_{i,j}^{1,k}) + (\sum_j \sum_i w_{i,j}^{2,k} \cdot p_{i,j}^{2,k})) \quad (2)$$

where k – is the serial number of the cluster (k = 1..3); V^k – is an indicator of the synergistic value in the cluster; $w_{i,j}^{1,k}$ – is the weight of the i-th component for the j-th element of cluster first component ; $w_{i,j}^{2,k}$ – is the weight of the i-th component in the j-th element of cluster second component; $\sum_{i,j} w_{i,j} = 1$ for each component of the cluster; $p_{i,j}^{1,k}$ – is an estimate of the value of the i-th component in the j-th element of the cluster first component; $p_{i,j}^{2,k}$ – is an estimate of the value of the i-th component of the j-th element of cluster second component; ($p_{i,j}$ = 1..10), s^k – is the synergy multiplier (1..10) for the k-th cluster.

Each cluster contributes to the overall IT development, so it can be assumed that a synergistic effect is also created due to the interaction of clusters. We will call such a synergistic effect in terms of increasing values F-synergistic (full synergistic) and provide a corresponding definition.

Definition. ***Full synergistic value (F-synergistic value)*** is the complex value of the project and operational component of a project-oriented organization that develops its IT tools using self-managed project teams within the organization.

The evaluation of each component (both project activity and operational activity) is proposed to be carried out through the processing (generalization) of evaluations according to three variations of weighting factors:

- equal weighting coefficients for each evaluated component;
- random weight coefficients for each evaluated component;
- the weighting factors are determined by experts from the management of the IT vertical of the project-oriented organization (at least three experts).

We present a model for determining the F-synergistic value according to the first variation. Therefore, when evaluating the value, we will use the hypothesis of the equivalence of each component in the overall evaluation.

$$V^{SF} = 0{,}33 \cdot \Big((s^1 \cdot ((\sum_j \sum_i w_{i,j}^{1,1} \cdot p_{i,j}^{1,1}) + (\sum_j \sum_i w_{i,j}^{2,1} \cdot p_{i,j}^{2,1})) + s^2 \cdot ((\sum_j \sum_i w_{i,j}^{1,2} \cdot p_{i,j}^{1,2}) + (\sum_j \sum_i w_{i,j}^{2,2} \cdot p_{i,j}^{2,2})) + s^3 \cdot ((\sum_j \sum_i w_{i,j}^{1,3} \cdot p_{i,j}^{1,3}) + (\sum_j \sum_i w_{i,j}^{2,3} \cdot p_{i,j}^{2,3}))) \Big) = 0{,}33 \cdot \sum_k s^k \cdot P^k, \quad (3)$$

where V^{SF} – the indicator of the F-synergistic value of IT development of a project-oriented organization, which is guided by syncretic methodology in the implementation of projects, P^k – the overall assessment of the k-th cluster without taking into account the synergism between its components.

When implementing any other variation, the F-synergistic value can be determined through the following model:

$$V^{SF} = \sum_k \vartheta^k \cdot s^k \cdot P^k, \quad (4)$$

where ϑ^k – is the weight of the k-th cluster in the overall evaluation of the F-synergistic value of IT development of a project-oriented organization guided by syncretic methodology in the implementation of projects.

D. THE METHOD OF MAXIMIZING THE F-SYNERGETIC VALUE

Based on the assumption of the creation of main and additional synergism (or synergism of the first and second orders) in IT development projects of project-oriented organizations guided by the syncretic methodology, we will propose a method of maximizing the F-synergistic value. It is worth noting that the hypothesis assumes that the main synergism (first-order synergism) occurs between cluster constituents, while additional synergism (second-order synergism) occurs between clusters.

Let us offer the steps of the F-synergistic value maximization method.

1. Creation of a team of professionals to implement the assessment of F-synergistic value and the implementation of models for its optimization.
2. Analysis of each component of each cluster, selection of parameters that characterize each component and carry the corresponding value.
3. Determination of estimates of the values of each parameter of each component of each cluster.
4. Determination of first- and second-order synergy multipliers.
5. Calculation of the F-synergistic value indicator at the current stage of development of a project-oriented organization that implements projects within the syncretic methodology.
6. Determination of correlations between indicators included in the overall assessment.
7. Analysis of the conducted research and putting forward proposals (in the form of models) regarding the improvement of individual performance indicators of the project-oriented organization.
8. Implementation of the proposed models of activity improvement.
9. Re-evaluation of the F-synergistic value.
10. Comparison of F-synergistic value estimates obtained in steps 5 and 9 of this method, conducting the analysis. If

necessary (as determined by the team), repeat steps 6-9 of this method.

So, it can be noted that the proposed method has an iterative nature, as part of its steps can be repeated several times, within iterations. With the help of such iterations, it is possible to more accurately determine the dynamics of the interaction of the components of each cluster, which will be needed to select a relevant model of response to the dynamics of synergism within the cluster and between clusters.

IV. RESULTS

The method involves several cycles of evaluating the F-synergistic value, and therefore the dynamics of the change in the synergy multipliers can be observed, which will indicate changes in the corresponding cluster.

We will analyze all variants of such dynamics and present hypotheses for each of the 27 relevant scenarios. Table 1 shows the scenarios when it is fixed that the multiplier s1 did not change and remained at the same level. In Table 2, the scenarios according to which the synergism between the components of the first cluster ("IT + people") decreased, in Table 3 - increased.

Table 1. The set of hypotheses under the condition of the s1 indicator stability

№	Dynamics of s1	Dynamics of s2	Dynamics of s3	Hypothesis
1	Stable	Stable	Stable	The risk of an imminent decline. The need for innovation
2	Stable	Stable	Growth	Window of opportunity. The need for new projects
3	Stable	Stable	Decrease	Zone of increased external risks. The need to correct the methodology
4	Stable	Growth	Stable	Increasing efficiency. The need for new projects
5	Stable	Growth	Growth	Rapid growth. The need to increase the number of qualified professionals
6	Stable	Growth	Decrease	"Fragile ice", a delicate balance on the edge of risks. Need for new products/markets
7	Stable	Decrease	Stable	Loss of process efficiency. The need for a reengineering project
8	Stable	Decrease	Growth	Inadequacy of the management system to modern challenges. The need for crisis management
9	Stable	Decrease	Decrease	Significant risk of imminent decline. Need for new products/markets

We will propose hypotheses regarding the reasons for such dynamics for each scenario, as well as models for further IT development of a project-oriented company in response to such reasons.

Thus, it can be noted that the first set of scenarios (1-9) determine the state of a project-oriented organization, in which the level of interaction between professionals in the organization's staff and the advanced IT technologies used is supported (Table 1). At the same time, the synergism of the second and third clusters can have different values.

The second set of scenarios (10-18) determine the state of the project-oriented organization when the efficiency of "people + IT" interaction deteriorates (Table 2) with different dynamics of synergism of other clusters. This set of scenarios is a list of the worst options for a project-oriented organization from the point of view of internal development potential, and with negative dynamics of all clusters, the company is most likely to cease to exist.

Table 2. The set of hypotheses under the condition of the s1 indicator decrease

№	Dynamics of s1	Dynamics of s2	Dynamics of s3	Hypothesis
10	Decrease	Stable	Stable	Resource crisis – IT technologies and/or competencies. The need for professional development
11	Decrease	Stable	Growth	Critical crisis of resources - IT technologies and/or competencies. The need to replace key resources
12	Decrease	Stable	Decrease	The trend towards the decline of the market. The need for crisis management
13	Decrease	Growth	Stable	Reducing the role of the IT component. The need for retraining
14	Decrease	Growth	Growth	Mismatch of market resources – IT technologies and/or competencies. The need to replace key resources
15	Decrease	Growth	Decrease	The trend towards the decline of the market. The need for new products/markets, changes in part of the staff
16	Decrease	Decrease	Stable	The onset of the bureaucratization phase in the company. The need for new ideas, projects, reengineering
17	Decrease	Decrease	Growth	Mismatch of market resources – IT technologies and/or competencies. The need to replace most resources
18	Decrease	Decrease	Decrease	Decline. The need to exit the market.

The third set of scenarios (19-27) determine the state of the project-oriented organization when improving the effectiveness of "people + IT" interaction (Table 3) with different dynamics of synergism of other clusters. This set of scenarios is a list of the best development options for a project-oriented organization (taking into account the hypothesis that the resource cluster is a determining factor in the internal development of a project-oriented organization).

Table 3. The set of hypotheses under the condition of the s1 indicator growth

№	Dynamics of s1	Dynamics of s2	Dynamics of s3	Hypothesis
19	Growth	Stable	Stable	High growth potential. The need to enter new market niches
20	Growth	Stable	Growth	Maximum growth potential. The need for soft process improvement
21	Growth	Stable	Decrease	Risk of decline. Need for new products/markets
22	Growth	Growth	Stable	Very high growth potential. The need for new company products is possible
23	Growth	Growth	Growth	Ideal growth potential. There is no need for additional actions

24	Growth	Growth	Decrease	Risk of market decline. The need for reorientation to new markets
25	Growth	Decrease	Stable	Inefficient management. The need for professional development
26	Growth	Decrease	Growth	Process efficiency risks in a growing market. The need for reengineering
27	Growth	Decrease	Decrease	Risk of decline. The need for reengineering and reorientation to new markets

Based on the results of the analysis of a number of scenarios, a list of hypotheses was obtained. The first part of each hypothesis describes the likely state of the environment for the implementation of IT development projects by a project-oriented organization. The second part of the hypothesis contains recommended models of actions in response to such a state. Such action models can be systematized and combined into scenario models of the IT development project plan with possible further detailing and implementation in the calendar and network planning program (MS Project Online, Oracle Primavera, etc.). The implementation of each such scenario plan (which will become a branch of the general detailed plan for the implementation of the IT development project) should take place according to certain defined triggers. One of the possible options for such triggers is the calculation of the F-synergistic value at the current stage, the comparison of the dynamics of cluster indicators with the previous stage, the analysis of such dynamics in accordance with the presented hypotheses (Table 1 – Table 3).

According to the results of the development of the method of maximizing the F-synergistic value of IT development projects of a project-oriented organization guided by syncretic methodology, directions for improving the activities of such organizations were determined. Among such directions, in particular, the following have been identified:

- Improvement of personnel qualifications in the context of cross-knowledge – operational management employees should acquire project management competencies, while project management employees should acquire operational management competencies;
- Increasing the general competences of both directions of the company (both project and operational) in the possession of modern IT technologies, models and methods of information management;
- Conducting trainings, coaching, business games on the application of syncretic project management methodology for project team members and in general employees of the project-oriented company, represented in the project subsystem of the project-oriented organization, in particular, in the PMO (Project Management Office) if there is one;
- Increasing corporate culture in the direction of deeper and better application of the value approach in management, implementation of value-oriented management at all levels in a project-oriented organization, constant periodic evaluation of values, adding to the corporate culture models and methods for determining and maximizing complex (for example, F-synergistic) value of activity.
- Improvement of flexibility, its introduction as a principle in the management system (in correlation with Agile). Flexibility and the ability to quickly reconfigure management models, methods, tools and methodologies.

In general, work on the specified areas of improvement of IT projects for the development of project-oriented organizations can potentially increase the level of maturity of the company in IT field, which will provide better indicators of the implementation for organization's projects in terms of time, cost, use of labor resources and achieving the maximization of F-synergistic value.

A. EXTENDED SWOT ANALYSIS

Let's conduct an extended SWOT analysis of the proposed method. To do this, we will determine its strengths and weaknesses, as well as opportunities and threats. After that, we will offer improvement models based on analysis of complex:

- SO – Strengths and opportunities (development of opportunities through the use of strengths);
- ST – Strengths and threats (overcoming threats through the use of strengths);
- WO – Opportunities and weaknesses (overcoming weaknesses through the use of opportunities);
- WT – Weaknesses and Threats (minimization of weaknesses to avoid threats).

To begin with, in the context of the implementation of the first form of SWOT analysis, we identify strengths and weaknesses, as well as opportunities and threats regarding the use of the proposed method.

Strengths.

S1. Taking into account both the project and operational components of the activity of the project-oriented company, in which the IT component development project is implemented.

S2. Calculation of the synergistic effect of the joint positive action of the components of influence on the project-oriented organization.

S3. Flexibility and scalability of the method due to the use of variable weights of criteria for adjustment (tailoring) to the desired project and project-oriented organization.

Weaknesses.

W1. The residual subjectivity of the method is due to the inclusion of one of the three components, which includes the subjective assessment of parameters by experts.

W2. The relative complexity of implementing the method in organizational and methodological aspects.

W3. The result of the assessment by the specified method is not absolute, but is only one of the possible arguments (along with others obtained by other approaches) for decision-making by the responsible person – that is, it is part of the decision-making support system.

Opportunities.

O1. The possibility of increasing the efficiency of IT development projects due to the use of synergy from the use of self-management, syncretism, advanced IT technologies and project management approaches through the use of the proposed method.

O2. The development of scientific models and methods of supporting the implementation of F-synergistic value projects in the implementation of IT development for project-oriented organizations implementing infrastructure restoration projects.

O3. The possibility of generalizing the proposed F-synergistic development method and extending it to other related types of projects.

Threats

T1. The use of the method will increase the burden on employees of project-oriented companies due to an ineffective implementation project, which may cause rejection of its use and, accordingly, lead to lost development opportunities.

T2. Insufficient competence of project team members who will be determined as responsible

T3. Insufficient attention to adjusting the method (tailoring) to the conditions of a specific project-oriented organization, as a result of which there is a threat to the reputation of the method in particular, and to project management in IT development in general.

Next, in the context of the implementation of the second form of SWOT analysis, we will define a set of proposed improvement models based on SO, ST, WO and WT analysis.

A summary of extended SWOT analysis is given in Table 4.

Table 4. Summary of extended SWOT analysis

	Opportunity *(external, positive)* – O1, O2, O3	**Threats** *(internal, negative)* – T1, T2, T3
Strengths *(internal, positive)* – S1, S2, S3	- Kaizen models for gradual improvement of methodology efficiency - Models of adjustment and improvement of the method due to its repeated use - Models of expansion of the method to other types of projects of the organization	- Models of education, training, coaching - Models of competence acquisition through other types of knowledge acquisition, knowledge base formation - Control over the implementation of the method by professionals
Weakness *(external, negative)* – W1, W2, W3	- Benchmarking models, formulation of lessons after each round of method application - Models of expert information processing to minimize the influence of subjectivism - Development of an IT tool that supports the implementation of the method	- Models of careful recruitment and effective onboarding - Models of organizational consolidation of responsibility for tailoring and method improvement - Models of flexible response of the management system to emerging risks

Based on the results of the SWOT analysis, it can be concluded that strategies were developed to increase the effectiveness of the method of maximizing the F-synergistic value of IT development projects in project-oriented organizations implementing infrastructure restoration projects within the syncretic methodology using self-management models. Such strategies are based on the use of strengths and opportunities to reduce the impact of threats and weaknesses.

VI. CONCLUSIONS

Value-oriented management is now a mandatory component of modern management systems, development systems of project-oriented organizations and their IT systems that ensure such development. In the context of ensuring the greater success of infrastructure restoration projects, the flexibility of management systems for such projects, and increasing the speed of decision-making within them, it is important to develop the IT systems of enterprises that are participants in restoration projects. An actual scientific and practical problem is the creation of models and methods for ensuring the coordinated harmonious development of IT systems (through the implementation of relevant projects) with a synergistic effect. Developments in this direction are insufficient, which led to the conduct of this study.

Here we highlighted the previously unsolved part of the scientific problems. In order to formulate a method of maximizing the F-synergistic value of IT development projects of project-oriented self-managed organizations that manage projects within the syncretic methodology, a certain number of relevant models were proposed. In particular, the objects of value analysis in a project-oriented organization carrying out IT development were identified, among which stellarator projects were selected. The concept of F-synergistic value is defined. Such a value is proposed to be calculated through the aggregate value of three clusters that create synergistic effects both within themselves (first-order value) and among themselves (second-order value). Models for determining the value of a separate cluster and the aggregate F-synergistic value are designed, and the method of maximizing the F-synergistic value of IT development of a project-oriented company is proposed within the syncretic methodology.

An analysis of the development results was carried out. The model of 27 scenarios of the dynamics of the change of the multipliers of synergy of three clusters is presented. The hypothesis is put forward regarding the reasons for such dynamics for each scenario, as well as a model of further IT development of a project-oriented company in response to such reasons. According to the results of the development of the method of maximizing the F-synergistic value of IT development projects of a project-oriented organization guided by syncretic methodology, directions for improving the activities of such organizations were determined. An extended SWOT analysis of the proposed method was conducted. For this, its strengths and weaknesses, as well as opportunities and threats, are determined. After that, models for improving the activity of a project-oriented organization are proposed, which aim to improve the work of the method, based on the analysis of the set of strengths and opportunities, strengths and threats, opportunities and weaknesses, opportunities and threats. Conclusions based on the results of an extended SWOT analysis are formulated. To use the opportunities with help of the strengths of the method, the following models are offered: kaizen models, models of adjustment due to repeated use, models of expansion. To overcome threats through the use of strengths, the following models are offered: models of training, models of competence acquisition, models of control by professionals. To reduce the weaknesses, we proposed: benchmarking models, expert information processing models, IT tool development.

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

- Further development of the method, its expansion to other types and types of projects to which it can be applied, taking into account their specifics and making the necessary corrections in the models that are the basis of the method;
- Practical testing of the proposed method in the practice of implementing the development of IT systems to ensure the implementation of projects of restoration and infrastructure development;
- Refinement of models using the proposed method, as well as the parameters of such models based on the results of practical testing;

- Further development of the value approach within the syncretic methodology, thanks to the use and development of the proposed method;
- Determination of models of competence of specialists who will use the method of maximizing the F-synergistic value of IT projects for the development of a project-oriented organization guided by syncretic methodology.

The authors plan to carry out further research in the chosen direction, in particular in the field of IT projects for the development of self-managed project-oriented organizations, with the aim of improving models, methods and IT tools that implement the syncretic methodology of managing projects, programs and portfolios of IT projects.

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