Chapter

Implementation of a Value-Oriented Strategy of the Organization through a Portfolio of Projects

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Abstract

The article deals with the methodological aspects of implementing the organization's strategy through project portfolio management. The existing concepts, models, and methods of organizational development portfolios management are analyzed. The types of organizational cultures are considered in accordance with the evolutionary theory of values. The article shows that the success of the implementation of the organization's development strategy is impossible without taking into account its dominant values. The organization development model links the spiral nature of systems development and the organization's strategy in the form of a project portfolio. The model of the projects' portfolio formation based on the definition of organizational values at the stages of the life cycle of the system is shown. The application of the competitive analysis method for the projects' portfolio formation using the principles of value-oriented and reflexive management for making management decisions is presented.

Keywords: organization development strategy, project portfolio, value-oriented portfolio management, organizational values, portfolio components

1. Introduction

The current state of society shows that the future is becoming increasingly uncertain and unpredictable and management systems do not keep up with the changes that are taking place. As a result, acute problems become the subject of theoretical research after they have become quite acute [1]. In the process of human activity, there are always crises. The history of humankind perceived as an endless stream of crises. Systems management theory recommends developing anti-crisis measures in advance and training staff to act in conditions of endless change and improvement.

Today, most business leaders recognize the important role of strategic planning and professional portfolio management in organizational development [2]. In modern economics, the expediency of development, at the center of which is only material production, has long been criticized. This necessitates a change in the general paradigm of human development from the ideology of accumulation of material wealth and competition for resources to the ideology of reasonable sufficiency and

mutual assistance. This paradigm is used in the theory of sustainable development management, the main provisions of which are already sufficiently lighted up in specialized publications [3–5]. It is substantiated that strategic goals require systematic, systematic technology of development and implementation of appropriate project portfolios for harmonized strategic goals achievements.

However, there is a common misconception about how well a portfolio of projects should match an organization's development strategies. Creating strong links between the strategy and many projects allows concentrating on the strategy implementation. However, the links between strategy and projects are the weakest points in the portfolio management methodology. The task of transforming the developed strategy into a projects' portfolio is poorly structured, it lacks unambiguous methodological unity, and needs to update in connection with the emergence of new theories and scientific schools.

The analysis of the literature shows that in most cases the portfolio is considered only as a set of assets [6–8]. Managers use portfolio analysis in a variety of ways, mostly just to decide which markets or industries to invest in. Nevertheless, in our study, we consider the project's portfolio management as a professional discipline that aims to maximize the business value of the organization through the selection, optimization, and supervision of investment projects that are consistent with the development organization strategy [9, 10].

In modern methodology, the main idea of the project portfolio management is to create new value by implementing a strategy in the form of programs and projects [11]. This value arises during the portfolio realization and becomes a source of additional assets for the organization [12]. Theoretical and methodological problems of project management optimization in the conditions of social evolution of values considered only sporadically, without application of the system approach, scientifically substantiated conclusions, offers, and recommendations. With this in mind, our study aims to create conceptual foundations, models, and methods that form the base of the value-oriented project portfolio management. The work is based on the hypothesis that the value orientation of organizations' development management provides a single content and communication basis for improving the processes of strategic portfolio management. Based on the evolutionary theory of values of K. Graves [13], it is proposed to consider project portfolio management from the standpoint of a fundamentally new paradigm - as a systematic activity to develop dominant values in the organization through the projects' portfolio. In the context of this methodology, we use the statement that the project is a commitment to creating value. The second element is the statement that the highest level of organization maturity, which leads to its continuous improvement, is the project portfolio management. The third element of the methodology is the continuous improvement of the project environment through the definition and change of value priorities of all stakeholders. Without the application of this methodology, it is impossible to ensure stable organization development.

2. Literature review

As defined earlier, portfolio management is the tactical level of the organization's development strategy implementation. Portfolio management covers the widest range of strategic issues of system development and provides significant benefits for organizations [14]. It improves decision-making on which projects the resources should spend on in line with the organization's strategic goals. The concept of dynamic project portfolio management provides an understanding of how firms use resources to achieve their goals [15].

Projects are the main means of providing new business opportunities and effective change management in enterprises. Thus, the formation of a portfolio of projects is necessary to comply with the market changes, and processes of the identification, prioritization, and implementation of relevant projects depend on them [16].

There are several definitions of project portfolio management (PPM), which emphasize different aspects of PPM. For example, the US Project Management Institute emphasizes coordination between projects to achieve strategic goals: "A portfolio is a set of projects or programs and other work that are grouped together to help effectively achieve strategic business goals [17]. The UK Department of Public Trade takes a forward-looking approach, stating, "PPM is a process at the corporate strategic level to coordinate the successful implementation of the firm's entire set of programs and projects" [18]. Some publications have described PPM as an area of new product development [19].

PPM has aspects related to financial portfolio management, such as risk balancing and rewards [20, 21] and describes real options used in financial portfolio management to help prioritize project portfolios based on an overall risk strategy. The concept of PPM in world standards and models, interpreted from different points of view, significantly affects for the procedure of project portfolio formation. Thus, in some American companies, the approach is used [22], according to which all projects of the organization are divided into four portfolios: large technology projects, small technology projects, internal organizational projects, and administrative projects' portfolio. In some companies, projects are divided into three portfolios: alternative projects, independent projects, and combined projects' portfolios [18].

In the context of PPM, the complexity increases due to the great variety of project types [23], the difficulty of identifying and evaluating many benefits [24] for specific investments. Portfolio formation methods focused on obtaining the maximum return on the investment portfolio are based on known investment indicators (ROI, NPV, DPP, RI). For such a portfolio, the task of maximizing the total profit of all projects is solved, taking into account budget constraints, resource provision, and time constraints. The list of candidate projects may include numerical indicators of their value obtained through preliminary project analysis. Recently researches emphasize the need to adapt the strategy and portfolio management to the uncertainty of dynamic environmental conditions [25]. Recent research mainly develops strategies for predicting asset returns in environments with significant uncertainty and volatility [26–29].

In terms of value approach, the indicators that need to be improved do not necessarily have to connect with financial returns; they may be any parameters that are a measure of the value of the portfolio. Strategic project portfolio management is a continuous process of creating and evaluating a set (portfolio) of strategic initiatives designed to achieve sustainable results and benefits in increasing the market value of the organization. In such project portfolios, we have to solve a multicriteria decision-making task and deal with a set of alternatives, a set of criteria, and a set of criteria evaluation scales.

3. Research methodology

The scientific and technical problem of creating basic methodological principles and models of value-oriented project portfolio management was solved based on the evolutionary theory of values and modern project management methodology. In the process of research were used: methods of project, programs and portfolios management (to analyze the creation of organizational values through project implementation); systems theory and systems analysis (to formalize the processes

of portfolio management of organizational development); means of mathematical modeling and dynamic programming (for modeling value-oriented management of organizational development).

4. Value-oriented principles of organization development portfolio management

In project management, the importance of "soft components" has been steadily growing in recent years, which is associated with the defining role of the individual in project management. This human side of project management has become much more important in recent years, not only in practice but also in scientific research on project management [30]. The dominant factors for the analysis of human behavior in project management continue to be the project manager personality, project teams, and a specific project environment.

During the last century, the management theory transformed from the management by instructions (MBI) to management by objects (MBO), which is still popular. From the end of the last century in the organizational management, there were signs of methods of management on the basis of values (management by values or MBV) [31]. The main goal of this management is to take into account the personal human parameters of managerial thinking at a theoretical and practical level. The concept of "value" is one of the fundamental concepts of modern science. Value is a form of social being, a special social relationship, thanks to which the needs and interests of a person are transferred to the world of things, giving them certain social properties that sometimes are not directly related to their utilitarian purpose. Based on this, the definition of the concept of "value" in the project context formulated as a personal perception of the project product due to its unique properties to create certain benefits in the various contexts of life.

K. Graves, the founder of the values evolution theory [13], considered that the stage of development of the organization values could be characterized well in terms of the manifest rules, norms, and principles of internal relations. According to the theory of K. Graves, the development of an organization follows a double spiral. The external spiral is the living conditions and problems that the organization faces in a certain historical time. The inner spiral is the individual characteristics of the organization, cognitive processes, that is, the collective intelligence and mental abilities with which the organization "filters" the outside world. External conditions constantly interact with the internal structures of the organization. The strategy arising from this interaction determines strengthening the current level of organization's values or the transition to another level of organizational values. Later, R. Dawkins in his book "The Selfish Gene" [32] hypothesized that the value meme is a unit of information located in the human brain and is a certain mutated in cultural evolution virus.

Organizational values are the mental platform, the spiritual core of the organization, based on which the norms and behavioral patterns in the organization are built [11]. It is the values shared and declared by the founders or the most authoritative members of the organization that often become the key link on which the cohesion of employees depends, the unity of views and actions is formed, and the achievement of the organization's goals is ensured.

Strategic projects' portfolio management is a continuous process of establishing, optimizing, and strategic initiatives assessing, which are important for achieving strong competitive challenges. Strategic goals and project portfolio link and influence each other. The main task of PPM is along with the constant strategy development management to get the maximum values from the investment.

As defined earlier, the issues of methodology of value-oriented portfolio development have not been the subject of special systematic research so far. Some works of foreign and domestic scientists cover only certain general aspects related to the problematic issues of this subject area.

Since the main objects of transformation in projects are artificial and natural systems, the project management methodology is based on systems' theory. A systems approach is an effective tool for rationalizing and improving project processes. It provides the logical structure and sequence within which data is collected and analyzed. Besides that, we identify causal relationships, action priorities, and alternative projects. A systematic approach need not only develop a holistic project structure but also through systemic issues consider the project as a final product or service.

The standard design methods that take place in projects with material objects are called the hard system approach (HSA), and the soft system approach (SSA) is the methods that used when we are dealing with something intangible, for example, projects connected with the relations of the human community.

The main difference between "soft" systems from "hard" ones is the fact that for "soft" systems a person is the most important fuzzy element [33]. However, it is not always correct to consider the presence of a person in the system as the main criterion separating hard and soft approaches. Rather, the hard and soft systems approaches should be distinguished by the nature of the approach to problem solving. If all the factors of the problem are rigidly formalized, determinated, then in this case the situation is presented as "hard". The soft systems approach associated with non-material categories concerns such concepts as motivation, dynamic leadership, the hierarchy of values, dedication to work. Such poorly studied factors associated with human behavior, as a rule, are not taken into account in the complex formulation of management tasks. However, these factors are often the only reason for project management failure, requiring the integration of the efforts of all stakeholders. All these forces project managers to study more deeply and use the acquisition of other natural sciences, such as the theory of evolution, the theory of knowledge, cognitive and humanistic psychology, and social informatics. The main differences between the hard and soft systems approaches are presented in **Table 1**.

The main objects of transformation in project management are artificial and natural systems, and the basis of project-oriented management are several system

Hard system approach	**Soft system approach**
The problem has a solution	Too many problems need to be solved
The problem has a number of achievable goals	Goal achievement is difficult to measure
The problem answers the question "How?"	The focus of the problem is not only on the question "How?", but on the question "What?"
The problem has a deterministic complexity	The problem has an unforeseen, non-deterministic complexity
It is possible to determine the parameters of failure	It is very difficult to deal with the problem
The solution of the problem does not depend on the values of system	The decision depends on the values of system and professional mentality of the staff
Logically consistent connections	Intuitive metaphorical connections

Table 1.
The difference between hard and soft system approach.

concepts [34, 35]. The most important trend in project management development is manifested in the structuring of project management at three levels: project portfolio, programs, and individual projects. If a company chooses the wrong project (program, portfolio), it cannot succeed in its development, even if it successfully achieves the goal of the project. The success of a wrong or ill-conceived project can lead to the destruction of corporate values. Project selection is an investment of valuable corporate resources. Therefore, the company must choose a project that will create significant corporate value.

In mature organizations, project management at the highest level is used in the form of portfolio management of projects in line with the development strategy. Compared to managing a single program, the project portfolio has a broader context. The structure of the required organizational platform for system project management is as follows (**Figure 1**).

Modern project management, based on the increasing importance of "soft" project components, allows you to create new ways of thinking and generating ideas that create added value to projects. In this case, the strategy is considered as a generalized model of designing activities to achieve the desired future, consisting of basic conceptual provisions and a set of design tools aimed at the evolution of the company's values.

In the second half of the last century, the eminent psychologist K. Graves, having processed a huge amount of experimental and statistical data, created a spiral model of the evolution of the human value system. The Spiral vortex best depicts the development of human systems as they evolve through levels of increasing complexity. Each upward turn of the spiral marks the awakening of a more elaborated version of what already exists [13]. The image of the development spiral arose as a dialectical negation and synthesis of two metaphysical processes of development; the image of translational motion in a straight line and the image of motion in a closed circle. The special value of Graves' theory in its cholic approach. Each subsequent level of development of society is considered as the next stage of changes, and the higher levels of development of society do not deny but include all previous stages. An important feature of the evolutionary spiral model is that each odd level focuses mainly on individual values, and each even level focuses on collective values.

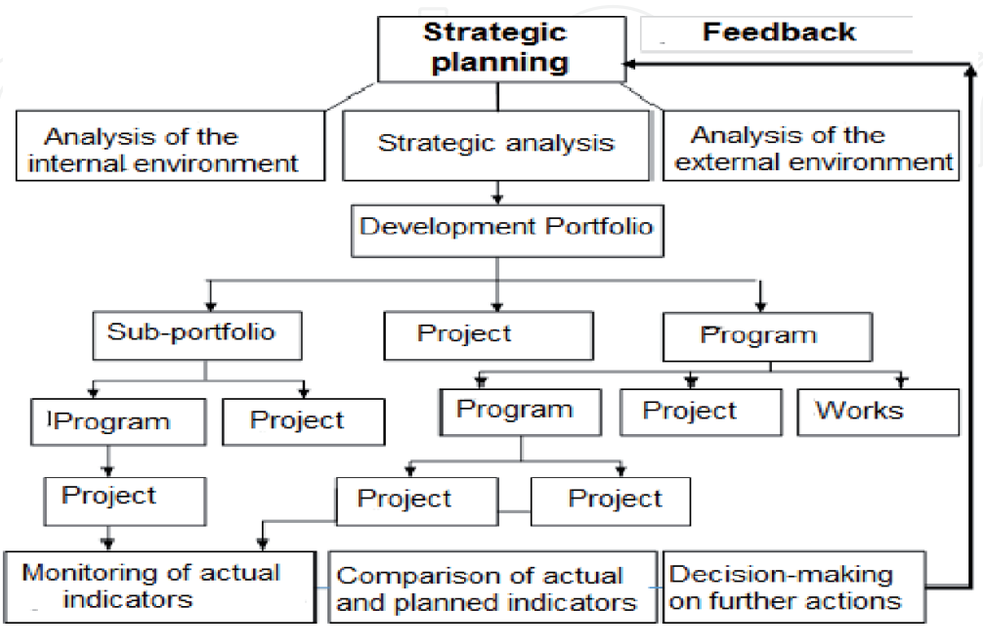

Figure 1.
Organizational platform for the implementation of development strategy.

An integrated model of values allows us to build a value profile of the organization. Without understanding the profile of the organization values it is impossible to effectively manage project-oriented development or any changes in general. According to K. Graves' theory, after the phase of full prosperity of the organization, it is not necessary to experience aging and gradual death, if you prepare in advance for its revival or transition to another level of organizational values (introducing new value memes). The semicircle of rotation of the organization in a spiral according to K. Graves [13] corresponds to the full life cycle of the company according to I. Adizes [35]. Although such a transition is accompanied by a period of a temporary decline in organizational efficiency and increasing uncertainty (**Figure 2**).

The development of the organization in a spiral is from a lower level of complexity to a greater one; from the mode of activity required to solve one set of problems, to the mode of activity essential for solving complex problems of the next level of living conditions. Those who adapt to new conditions survive, no matter what it requires, although sometimes it requires a complete replacement of the built intellectual model. At the same time, very often a number of significant variables in living conditions lie beyond the capabilities of the set of value memes of current leaders. Until new value memes are initiated or activated by change leaders, only stagnation and, more likely, degradation can be expected.

Each step of the spiral movement solves one set of problems and generates a new one for the future, that is, the evolutionary movement of the organization in a spiral, like any constant improvement, has no limits. This portfolio lifecycle modeling has two purposes: the model determines the sequence of management actions to add value and serves as a basis for the formation of detailed projects' plans. In the first case, we are dealing with a conceptual model of organizational values, and in the second - the model becomes a planning tool.

4.1 Conceptual model of organization development through a portfolio of projects

Portfolio management, as the highest level of mature project management in organizations, must comply with the laws of evolutionary development of systems. However, before forming a value-oriented development portfolio, it is necessary to

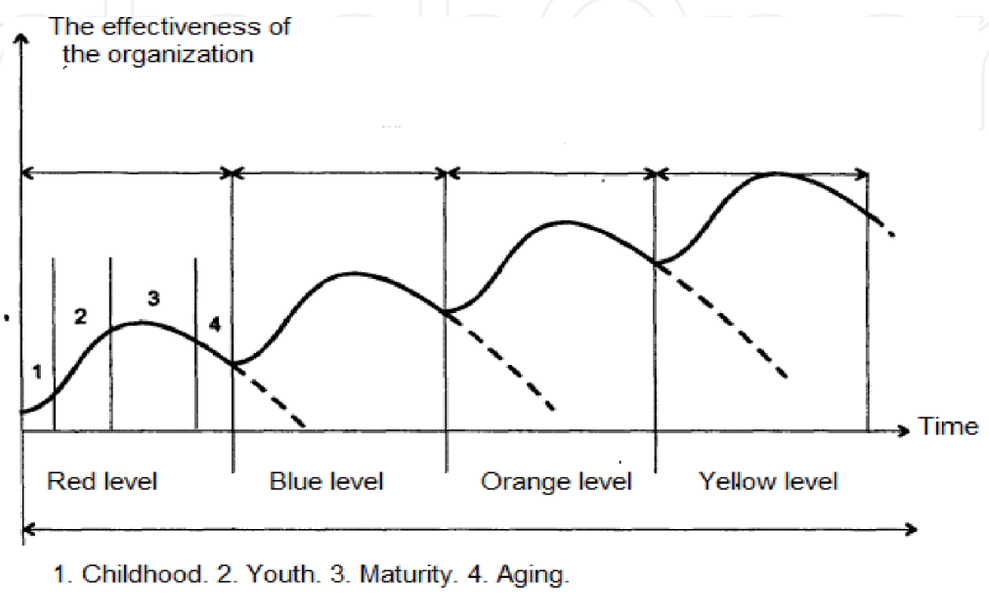

Figure 2.
Transition of an organization by value levels.

form a strategic vision of the future development of the organization, solving the problem of identifying internal organizational values and their possible change.

Defining evolutionary levels of values becomes a key concept in shaping development strategy through projects. Each level of spiral dynamics of values is a description of a unique world. The description of the company's value system helps to solve problems and successfully implement projects. Properly defining the company's dominant value system helps not only to answer the question of whom, how, and what should do in the company, but also it helps to determine the strategy of long-term changes. In this case, the spiral dynamics of the evolution of values does not refute the old theories, but organically integrates them into the overall dynamic models [36–38].

Defining strategic directions of organization development serves as a foundation for further creation of a portfolio of initiatives. The results and benefits gained from the implementation of these initiatives contribute to the implementation of the strategy and allow evaluating the effectiveness of the strategy and initiatives in creating value for the organization. This relationship could be illustrated in the form of a cycle consisting of four constantly repeated stages:

1. Transformation of strategy into separate projects.

2. Project portfolio planning.

3. Portfolio management.

4. Re-evaluation of strategy and portfolio.

The gradual increase in the capabilities of the system as project management develops is not the first time depicted in the form of a spiral untwisting from the center. According to this simple model, the development of an organization through project management is described as the gradual coverage of an ever-increasing plane that expands as projects move from stage to stage and from iteration to iteration. This model emphasizes that spiral development leads to a gradual expansion of the scope of the subject area of the organization. Conceptual scheme of modeling the development of the system based on a value-oriented approach, which includes four stages, are presented in **Figure 3**.

The value approach to the formation of a portfolio of organizational development is such that progress in each area characterized by a single integrated indicator. Each indicator may include several key performance indicators (KPIs), which assess the state of organizational values. Thus, the current state of organizational values could be described as a matrix of indicators in various aspects:

$$V_f = \left\{ V_1, V_2, V_3, \ldots V_j \right\} \tag{1}$$

In the PMI knowledge system, portfolio management aggregate into two groups of processes [17]:

- Aligning Process Group — this group determines how components will be categorized, evaluated and selected for inclusion, and managed in the portfolio;

- Monitoring and Controlling Process Group — this group reviews performance indicators periodically for alignment with strategic objectives.

The formation of the portfolio of development of the organization begins with an assessment of the current state of the organizational and technical system.

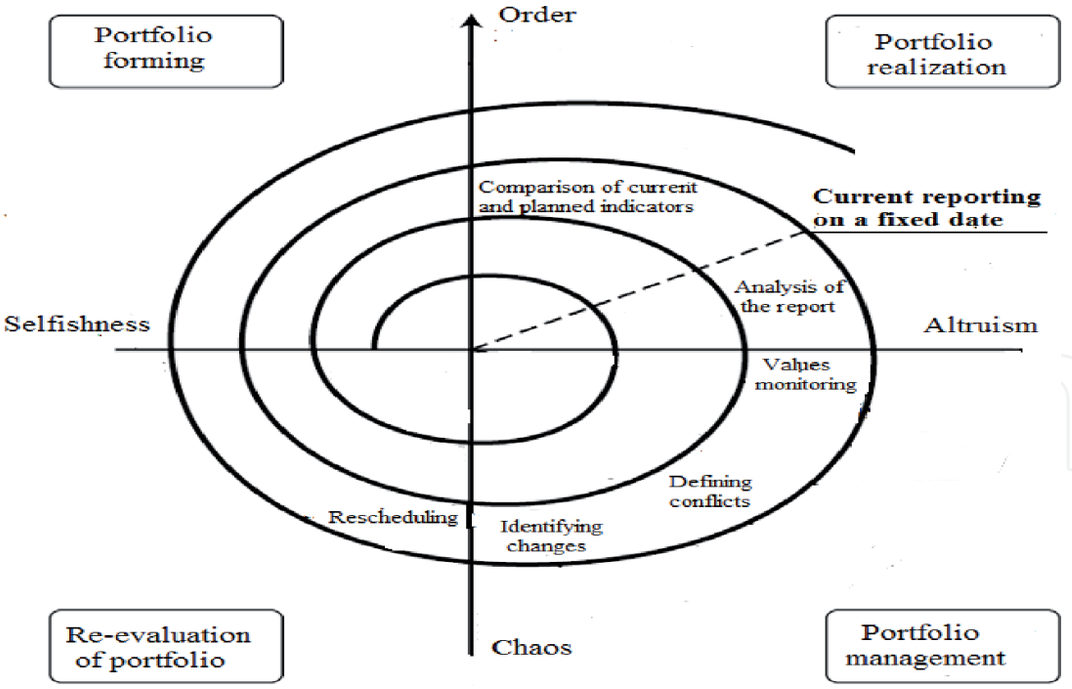

Figure 3.
Spiral development of the system based on a value-oriented portfolio.

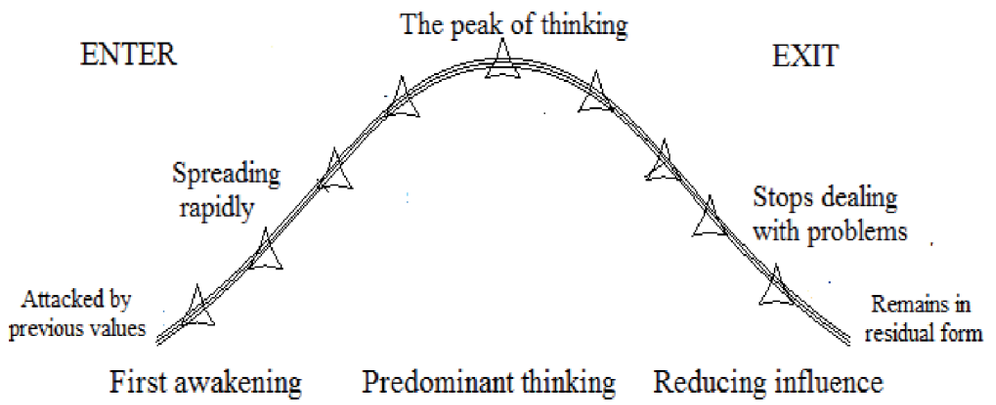

Figure 4.
The transition of the organization to another level of values [39].

Value-oriented portfolio affects all elements of the management system, i.e. it is aimed at organizational transformations, which, changing the existing value system, contribute to the maximum use of the managerial potential of the organization to move to a new level. The value-oriented portfolio should transfer the organization to a new higher level of development, without denying the values of the lower level. In **Figure 4** presents the sequence of such transitions in the direction of increasing the maturity of the organization [39].

This model shows that the organization in the course of development needs for constant organizational change, defined by the strategy of growth of dominant values. A holistic view of the organization's development strategy at certain stages of the life cycle requires a detailed consideration of the values based on which the portfolio is formed. The viability of an organization is determined by its ability to change values through project portfolios depending on changes in the external environment.

For a more detailed consideration of the dependence of the development strategy from the stages of the organization's life cycle and the state of internal organizational values, we assume that because of the implemented projects some organizations (**Figure 5**) moves to a bifurcation point (point A).

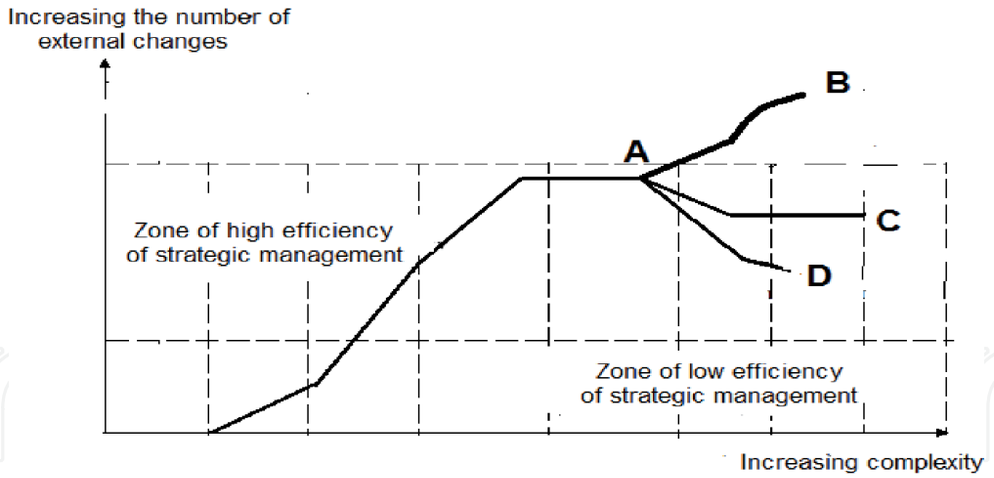

Figure 5.
Changing of the system value-oriented strategic movement.

After the phase of full prosperity (point A), either the organization must move to another level of organizational values (point B), or it is doomed to a gradual death. Consider three possible options for the development strategy of an organization in its blossom stage.

1. Wrongly chosen strategic position after the heyday leads the company to point D, which means a return to lower values and can cause an unexpected "death" of the company. It can be due to various reasons, such as a change in the rules of the game in the market, to which the company did not respond in time, or the withdrawal of one of the owners of the company.

2. One of the most common situations is when a company runs by a person blinded with the desire of "quick money", who does not know how to predict the future and does not feel the need for constant development. Such a straight road leads to a slow and painful agony at point C.

3. It is less common when the organization takes the right strategic position with entrepreneurial intuition. This stimulates the entry into a new cycle of development based on a new dominant value (point B), revenue growth due to new qualities of goods and services. The new quality should understand as a new focus on other quality values. Such evolutionary development can last forever, each time returning to the beginning of the cycle. Never less, the shape of the spiral requires constant review, taking into account the rapid changes in the environment.

The main principles of effective management are the reliability of sustainable development of the organization, the growth of its value over time. Strategies for achieving this goal can be different. It is clear that the "ideal" strategic position of the company is constantly changing over time, so the task of finding the best strategy is facing any organization. That is, at each of the selected stages of the life cycle of the organization there is an opportunity to choose a strategy for further development: to continue to increase the values of the current level; or prepare for the transition to the next level of values or freeze organizational projects, profiting from the existing level of values. The following set of strategic decisions should be presented in the form of:

$$G_k^p = \left\{ G_C^p, G_N^p, G_D^p \right\}, \tag{2}$$

where G_k^P is a strategic decision at a certain value level of existence of the organization, *P* takes a meaning from 1 to 7 and corresponds to seven known levels of values, and *K* takes meaning 1–3. So we get:

$$\begin{aligned} &k = 1 : G_1^p = G_C^p - \text{to continue increasing the current level values;} \\ &k = 2 : G_2^p = G_N^p - \text{transition to the next level of values;} \\ &k = 3 : G_3^p = G_D^p - \text{to return to lower level values.} \end{aligned} \tag{3}$$

The strategic decision is made by the management of the organization based on the understanding of the dominant organizational values at the current time. This requires tools to measure such values and their representation in numbers. An evolutionarily evolving system has the opportunity to move to the next hierarchical level of values, to begin to form information links of a new level of values.

Based on a generalized design algorithm, a model of the desired state of increasing organizational values increasing on a certain level is proposed. The model of organizational values based on identifying inconsistencies between the current state and the desired state of organizational values. Some aspects have been identified for assessing current and desired organizational values. Better strategic management of a company's projects based on a system of balanced scores proposed by Harvard School of Economics professors Robert Kaplan and David Norton [40, 41]. They studied the performance measurement systems of large companies that sought to improve their management systems by including non-financial indicators. The results of the study led to the emergence of relatively new technology - a system of balanced scores [40, 41]. The essence of this system is formulated in two main provisions:

- financial indicators alone are not enough to fully and comprehensively (balanced) describe the state of the organization, they need to be supplemented by other indicators;

- this system of indicators can be used not just as a comprehensive indicator of the state of the organization, but as a management system that provides a link between strategic goals and operational activities of the organization's management.

The system of balanced indicators translates the company's mission and strategy into a system of clearly set goals and objectives, as well as indicators that determine the degree of their achievement in four projections:

- finance (as assessed by investors);

- customers (as assessed by customers);

- internal business processes (to realize competitive advantages);

- training and growth (opportunities for the development of the company).

The main structural idea of this method is to balance the system of indicators in the form of four groups. The first group "finance" includes traditional financial indicators. No matter how we prove the importance of the market orientation of the organization and the perfection of internal processes, the owner will always be primarily interested in indicators of financial return on investment. Therefore, a balanced system must begin and end with financial indicators.

The second group indicators "business processes" characterizes the internal processes of the organization: innovation process; product development; organization culture; supply of basic resources; production; marketing; after sales service, etc.

The third group indicators "customers" describes the external environment of the organization, its relationship with customers. The focuses of attention: the ability of the organization to customer satisfaction; the ability of the organization to retain the client; ability to attract a new client; customer profitability; market volume; market share in the target segment.

The fourth group indicators "learning and growth" allows to describe the organization's ability to learn and grow, which focuses on the following factors: people with their abilities, skills and motivation; information systems that allow to deliver critical information in real time; organizational procedures that ensure interaction between the participants in the process and determine the decision-making system.

There is a causal link between the metrics and the goals of all four projections. For example, an increase in the absolute return on investment can be achieved by increasing the number of clients, which in turn is associated with a reduction of the errors in project planning (project implementation in terms of cost and time), as well as the level of staff competence. Thus, in the proposed model, value indicators are formed within the four projection, which characterizes the financial processes, management structures, team intelligence, and design technologies (**Table 2**).

Determining the discrepancies between the indicators of the organization on four types of balanced indicators between the current state and the desired can be represented in matrix form:

$$R = \begin{matrix} P_1 \\ P_2 \\ \cdots \\ P_n \end{matrix} \begin{bmatrix} \Delta(P_1,A_1) & \Delta(P_1,B_1) & \Delta(P_1,C_1) & \Delta(P_1,D_1) \\ \Delta(P_2,A_2) & \Delta(P_2,B_2) & \Delta(P_2,C_2) & \Delta(P_2,D_2) \\ \cdots & \cdots & \cdots & \cdots \\ \Delta(P_n,A_n) & \Delta(P_n,B_n) & \Delta(P_n,C_n) & \Delta(P_n,D_n) \end{bmatrix} \tag{4}$$

Level	Financial control	Management structures	Team intelligence	Design technologies
Beige.	Survival processes	Free groups	Automatic thinking	Repair of old infrastructure
Violet	Traditional are provided with a circular guarantee	Clans	Animistic thinking	Creation of new myths, ideological projects
Red	Operation	Hard hierarchies	Thinking is egocentric	Crisis management
Blue	Authoritarian bureaucracy	Pyramidal bureaucratic	Absolutist thinking	Construction of new systems
Orange	Strategic	Matrix, such as delegating	Multiple thinking	Creative projects
Green	Consensus, leveling	Horizontal, equalizing	Relativistic thinking	Ecological, socially oriented projects
Yellow	Integrating system	Interactive, network	Systemic thinking	Information technologies projects
Turquoise	Ecological, cholic	Global	Holistic thinking	Synergetic programs

Table 2.
The structure of values according to the levels of spiral dynamics.

Based on the definition of discrepancies, we form a portfolio of development to increase organizational values. The set of measures to eliminate discrepancies is presented in the form of a set of projects that are combined into a portfolio. An appropriate model was developed for the transition of the enterprise from the current state to the planned one by forming a development portfolio (**Figure 6**).

Structural decomposition of the portfolio into projects and programs means the ability to model the organization with varying degrees of detail, from the enterprise as a whole to a separate structural unit. Today, many companies face conflicts based on different development priorities within the company. Conflicts arise not because there are different views on development priorities, but because the company does not have a single agreed system of priorities. "Value-oriented management" is the search for and adoption of such priorities that will ensure the company's long-term evolutionary development. The main task of value-oriented management is to organize the joint coordinated work of all conflicting units because after agreeing on value priorities, the company becomes a community of like-minded people, which ensures the successful achievement of its goals.

Thus, understanding the essence and reasons for the spiral nature of systems development allows you to look at the development of the organization through the management of project portfolios from a new angle. Diagnosis of the dominant evolutionary values of the company's management system determines the strategy of formation and implementation of a value-oriented portfolio of projects, due to which the organization moves to a new level of evolutionary development. The current management of the evolutionary development of the organization can be implement through the portfolio management with using its methods, techniques, and tools. The proposed information technology model of enterprise development (see **Figure 6**) defines the basic tools of project portfolio management. All these steps can be formalized by placing information in a repository or retrieving it from the repository upon request.

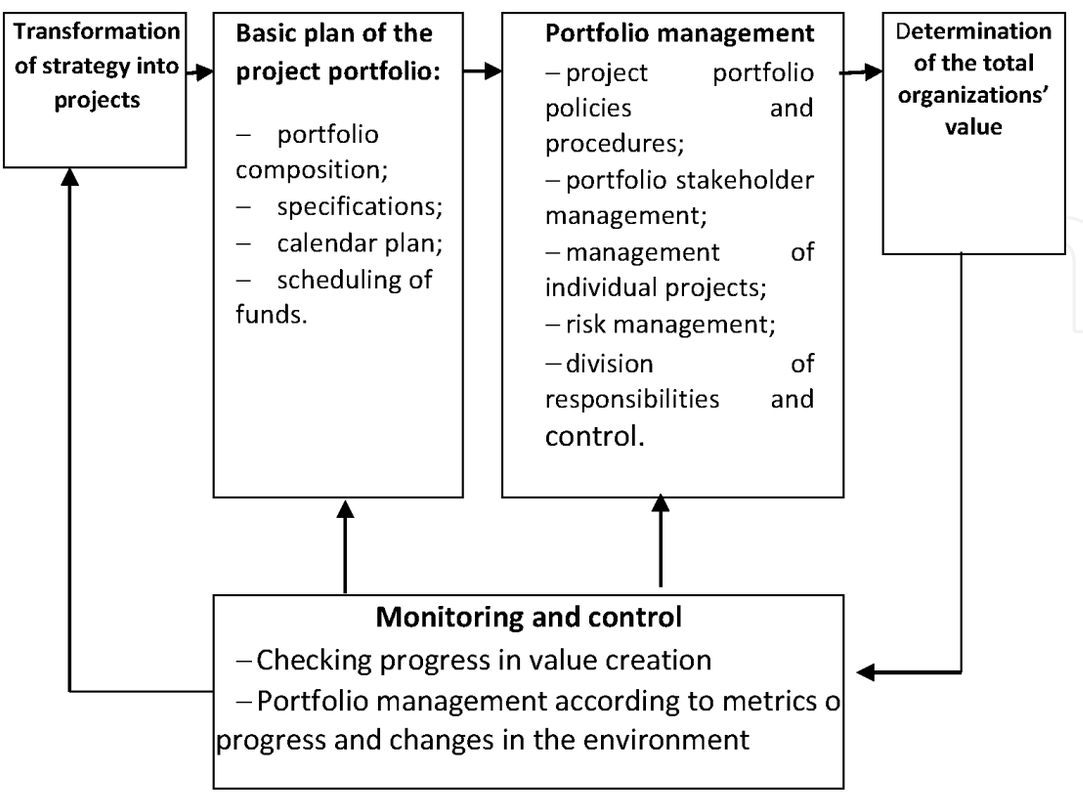

Figure 6.
Model of organization development portfolio formation.

The basic principles of portfolio formation, among other things, should determine: the desired composition of projects and programs within the portfolio; the level of risk to which the company is prepared in connection with the implementation of the portfolio, standards and restrictions, as well as key performance indicators for their further control. The dominant level of environmental values must also be taken into account when building the strategic focus of the organization, only so it is possible to implement the unique properties of the organization to create its competitive advantage.

The task of determining the profile of organization's values does not have an unambiguous solution, but it is very important for the development strategy of the firm. Project analysis offers methods and tools [9] that determine the interaction of the project organization with the project environment (economic, political, legal, social, etc.).

4.2 Formation of a value-oriented portfolio of organization development

In a narrow sense, the term "project portfolio formation" means determining which of the set of possible projects to start, which will be next, etc., provided that there are projects that can be started simultaneously and claim available resources. The overall process of project selection and resource allocation can be seen as the process of sequentially filling the order portfolio. The decision maker needs to know what funds can be spent on each of several possible projects in each of the time periods. At the end of each time period, the composition of the portfolio changes according to the projects that are currently in operation. Many of the existing projects consist of projects that are currently underway and projects that are in reserve.

In the general formulation of the problem of forming a value-oriented portfolio of development of the organization we have n projects, each of which is characterized by the corresponding costs and value. Restriction B is set on the amount of portfolio financing. It is necessary to form a portfolio of projects so that the total value of the portfolio was the maximum, provided that the amount of costs does not exceed B.

In accordance with the development strategy of the organization, the maximum number of options for strategic initiatives in the form of projects is developed. Before starting to form a portfolio of projects, they are preliminarily reviewed and discarded knowingly inefficient components, which reduces the number of alternatives in each area of activity. Let us denote $x_i = 1$, if the i-th project is included in the portfolio, $x_i = 0$ otherwise, then the mathematical formulation of the problem has the following form:

$$f(x) = \sum_{i=1}^{n} V_i x_i \rightarrow \max, \tag{5}$$

$$\varphi(x) = \sum_{i=n} c_i x_i \leq B,$$

$$x_i \in \{0;1\}, i = \overline{1,n},$$

where c_i - costs of the i-th project; V_i is the value of the i-th project.

However, this model of portfolio formation does not take into account the interdependence of the values of individual components of the portfolio. Meanwhile, the very consideration of interdependencies reflects the possibility of creating

either a synergistic effect of the components of the portfolio or their mutual destruction (the effect of cannibalism). The synergetic effect of the value-oriented portfolio means the case when the value from the implementation of the entire portfolio exceeds the sum of the values from the implementation of its individual components.

To take into account the interdependencies of portfolio components in the proposed model, a matrix of project dependencies is used to determine the additional values obtained from the implementation of dependent portfolio projects. The matrix of project dependencies is a square matrix of dimension n_p*n_p, where n_p, is the number of projects. Experts determine the values of the coefficients of dependencies of projects. Each element of the matrix d_{ij} can take values from 0 to 1 depending on the degree of connection of projects. The value of the coefficient d_{ij} shows the level of dependence of the project i on the project j. If the coefficient becomes 0, then the implementation of project i does not depend on the successful implementation of project j. A value of 1, in contrast, means that projects i and j are dependent, i.e. the success of one project directly depends on the implementation of another project, and as a result, both projects must be included in the portfolio. This matrix can be represented as follows:

$$\begin{bmatrix} d_{11} & d_{12} & \dots & d_{1n_p} \\ d_{21} & d_{22} & \dots & d_{2n_p} \\ \dots & \dots & \dots & \dots \\ d_{n_p1} & d_{n_p2} & & d_{n_pn_p} \end{bmatrix} \quad (6)$$

Once the interdependence matrix is formed, it is necessary to determine how the values obtained in the process of project activities are distributed among the dependent projects. To do this, a new parameter of the model V_i is introduced, which shows the share of the expected value in the case of the *i*-th project, if other dependent projects will not be launched. The remaining part of the value from the implementation of the *i*-th project and related projects in the amount 1-V_i is distributed among the dependent projects in proportion to the value of the relationship factors d_{ij}. The share of value allocated to dependent projects is reflected in the model by the following coefficients:

$$k_{ij} = (1 - V_i)\frac{d_{ij}}{\sum_{a=1}^{n_p} d_{ia}}. \quad (7)$$

The value D_{ij} from project *i,* obtained in the calendar year *t* is calculated based on a normalized matrix of dependencies (Eq. (4)). To assess the effect, it is necessary to enter a matrix of Boolean variables y_{it}, where y_{it} = 1, if project *i* is planned to start in year *t*, if not y_{it} = 0. The value obtained from the implementation of only dependent projects without taking into account the probability of their success can be determined by the following formula:

$$D_{it} = \sum_{j=1}^{n_p} k_{ij} Y_{it}. \quad (8)$$

The model assumes that a project starts only once and is funded throughout its life cycle. To simplify the model, it is assumed that the cost of the project does not depend on the year in which the project was launched (discounting is not taken into account). The costs for each component of the portfolio C_{it} are described in the form of a corresponding matrix. The model also includes projected revenue from each project by year, which depends on the year in which the project was started. The value of each element in the income matrix R_{it} is the income from project *i* in calendar year *t.* To account for the probability of success of each project on the basis of expert assessments, the probability P_i is assigned, and then the projects are ranked depending on the probability of success.

The model takes into account two types of restrictions: the budget and the number of projects in the portfolio. The budget B_t means the maximum amount of financial resources allocated for the implementation of portfolio projects in each calendar year *t.* The total cost of portfolio projects in each year may not exceed the budget. Therefore, we can write the following budget constraint:

$$\sum_{i=1}^{n_p} C_{it} Y_{it} - B_t \le 0, t = 1,2,\ldots,n, \tag{9}$$

where n – the duration of the settlement period of the portfolio.

The limit on the number of projects implemented in year *t* is recorded as:

$$\sum_{i=1}^{n_p} Y_{it} - Q_t \le 0, t = 1,2,\ldots,n. \tag{10}$$

The selection of projects for funding in each calendar year is based on maximizing the total value of portfolio *V*, subject to the restrictions. The function does not take into account the discounting factor to simplify the model. Under these conditions, the objective function has the following form:

$$\max \sum_{t=0}^{n_t} \sum_{i=1}^{n_p} Y_{it} R_{it} P_i \left(V_i - D_{it}\right) - \sum_{t=0}^{n_t} \sum_{i=1}^{n_p} Y_{it} C_{it} \le 0. \tag{11}$$

Thus, the objective function of the model is to maximize the total value of the portfolio subject to budget constraints and the number of projects implemented simultaneously. The optimization model is calculated using Matlab software. With the practical use of the model, there may be no acceptable solutions, in which case it is possible to set a stricter limit on the number of projects in the portfolio.

In the general case, when forming a portfolio it is necessary to select projects with a large set of parameters, i.e. to solve a multicriteria decision-making problem and deal with many alternatives, many criteria, and multiple scales of evaluation criteria. To simplify this problem, a sequential convolution of the values of the characteristics of alternatives is used, for example, based on the method of analysis of hierarchies proposed by T. Saati at the end of the last century [42].

The task of selecting the components of the optimal portfolio is a difficult task and to solve it better by methods of mathematical programming. At the entrance of this task, we need information on possible projects (with a certain value) and weight about the criteria of values. Only those projects that bring the necessary

value and, most importantly, correspond to the strategy at a certain value level of the organization's existence should be included in the portfolio.

As a result of solving the problem (for example, the simplex method), we obtain a set of projects from which should a portfolio consist of. However, this model can only be applied if the projects are independent. Taking into account the interdependence of projects in the portfolio is a very important point that reflects the possibility of creating a synergistic effect on the implementation of the project portfolio. Therefore, in the beginning, it is possible to estimate the total value of the portfolio without taking into account the interdependence of its components, and then calculate the total effect from the implementation of all components of the portfolio as a whole (synergistic effect).

4.3 Monitoring and control of the implementation of the development portfolio

Control of the implementation of the development portfolio based on deviations of actual indicators from the planned ones and determining the expediency of adjusting the strategy. Since the portfolio is a dynamic system, it means that the quantitative characteristics of its elements and the intensity of the relationship between them change over time, i.e. each current state of the portfolio structure corresponds to the actual current values of the properties of system elements.

Monitoring of the implementation of the strategy is carried out in order to provide all stakeholders with data that confirm or deny the existence of progress in achieving the goals and objectives of the strategy. In other words, it is the process of regularly collecting and recording data on key elements of the strategy implementation during the period of its implementation in order to determine intermediate and final results, timely identify problems and deviations from the planned results and make necessary adjustments to minimize negative consequences. Minimizing this inconsistency is the task of ongoing project portfolio management. Depending on the magnitude of this inconsistency in the system, problematic situations are possible, which are, respectively, states of advanced development, stability and stagnation of the organizational system.

An important task of monitoring is to document its procedures and results. This is primarily the responsibility of those directly involved in implementing the strategy or its individual elements, conducting monitoring procedures, and being responsible for data collection and processing. The project team members and the regional working group should carry out the synthesis of all obtained monitoring results.

The last step of management is the process of evaluating the achievements associated with the identification of public utility resulting from the implementation of projects and programs. Monitoring and evaluation of results should be made public in order not only to assess progress but also to make adjustments and monitor the sustainability of the results obtained. Unfortunately, not all project managers have practical tools for monitoring the implementation of projects and programs, understanding the political sustainability of the results, methods, and skills of preserving the experience of lessons learned.

Monitoring and control of portfolio performance and evaluation of the feasibility of adjusting the development strategy.

Because the enterprise is a dynamic system, this means that the quantitative characteristics of the elements that make up the system and the intensity of the relationship change over time:

$$S^d(t) = \left(E^d(t), R^d(t)\right), \tag{12}$$

where S – a certain structure, which is a set of elements E with ordered relations R.

The properties of the system also change over time, each current state of the enterprise structure corresponds to the actual current values of the system properties.

$$P^F(t) = F\left[S(t)\right]. \tag{13}$$

Comparison of $P^F(t)$ with target $P^d(t)$ allows determining the amount of inconsistency:

$$\Delta P(T) = P^d(t) - P^F(t). \tag{14}$$

Minimizing this inconsistency and taking into account rapid environmental changes is the task of ongoing project portfolio management.

Based on the law of positive dynamics, the external environment is a purposeful metasystem that has a vector of development aimed at achieving positive goals. Only processes that implement positive goals reduce the entropy of the system. The realization of the portfolio can be considered, first, as an approximation to the ideal state, the "portrait" of which at a certain stage of its development was "painted" by one or another social system. As you know, the system cannot be successful in its development if it successfully implements the "wrong" projects. Thus, all components of the development portfolio should correspond to the main vector of development of the organizational system. Mastering the project management methodology by Ukrainian managers would allow the country's leadership to implement its strategic priorities and commitments.

4.4 Method of the decisions preparation for the value-oriented portfolio management of the organizations

In the course of the research, the theoretical and methodological bases of management of development of the organizations by realization of the value-oriented portfolio of the projects formed based on the evolutionary theory of civilizational values were opened. For this purpose, the processes of project portfolio management in terms of their value significance were considered. The obtained results make it possible to describe the method, which should give a holistic view of the process of collecting, analyzing and preparing information on strategic decision-making in the management of value-oriented portfolio of development of organizations.

The formalization of the method is the basis for algorithmization and programming, without which the computerization of knowledge and research processes cannot do. Formalization of the method eliminates ambiguity, inaccuracy and uncertainty. When formalizing the method instead of statements about formalization we use a systematic representation in the form of clear structural elements. Based on the essence of the above models, we describe each of the structural elements.

The scope of the method of preparing information for strategic decision-making in the portfolios of organizational development is the practical activities of managing the development of the organization as a holistic open system in a changing environment. If the organization takes the right strategic position, it becomes possible to enter a new cycle of development based on a new dominant value. Such evolutionary

development can take a very long time, each time returning to the beginning of the cycle. Wrongly chosen strategic position at the stage of the company's prosperity can lead it to painful agony and bankruptcy. This happens when an organization, due to the limited thinking of managers, "gets stuck" at a certain level of values, while external circumstances push it to move to a new level.

The essence of the value-oriented method of preparing information for strategic decisions in project portfolio management is to obtain information based on the ratio of the values of the components of the portfolio in the intermediate configuration. Indicators of the values of the components of the portfolio are obtained using integrated indicators, which are formed based on the concept of a system of balanced scores, and expert assessments of stakeholders, taking into account the opinion of the decision maker. As for the objective basis of the method, it should reveal the essence of the description of the object of the method, which allows you to track the relationship between objects and their properties [43].

In the method of preparing information for acceptance strategic decisions in development portfolios, the objective basis of the method is a single-order essence of indicators that characterize the state of the components of the portfolio, taking into account the different options for its further development.

Elements of the method of preparation of information for making strategic decisions in the portfolios of development of organizations based on the evolutionary theory of values are summarized in **Table 3**.

The proposed method allows taking into account both internal and external aspects of the value of the components of the development portfolio at different times, which allows choosing a strategy for further development of the enterprise as a system. The method became the basis of the methodology of decision preparation for the value-oriented portfolio management of organizations. The proposed method was piloted to identify the features of its implementation, which was reflected in the terms of reference for software development with subsequent testing in real enterprises.

Structural element	**The essence of the structural element of the method**
Name	Method of preparation of decisions for formation of the value-oriented portfolio of development of the organization
Scope	It is used to form and implement a portfolio of development of the organization to justify the choice of one of the possible options for further development.
Goal	Obtaining recommendations for the customer on the choice of strategy for further development of the organization through project portfolios.
Essence	Recommendations for choosing one of the three possible strategies for further development of the organization. At each stage of the life cycle of the organization there is an opportunity to choose a strategy for further development: to continue to increase the values of the current level; prepare for the transition to the next level of values or freeze organizational development projects. The decision is made based on comparing the level of internal organizational values and the level of values of the external environment. If an organization gets stuck at a certain level of values, while external circumstances push it to a transition to a new level, it is likely to face a painful bankruptcy.
Basic conditions	Ranking of indicators that characterize the level of values of an individual projects and the strategic value of the projects portfolio at the current date
Objective basis	The number of experts must be at least eight, with the obligatory involvement of at least two representatives for each projection of the balanced scorecard.

Table 3.
Method for the value-oriented portfolio formation.

5. Conclusions

The generalization of the obtained results, scientific positions, the achieved goal and the solved tasks of the research allow drawing conclusions that are meaningfully correlated with the proved consequences of the basic hypothesis:

1. Theoretical provisions of management of development of the organizations by the realization of the value-oriented portfolio of the projects formed based on the evolutionary theory of values, which allowed formalizing a method of preparation of decisions for the formation of the value-oriented portfolio, to open essence of its structural elements, and basic rules are presented.

2. Methodological bases of value-oriented development management in the form of system principles, basic terms, stages of modeling and methods of estimation of dominating values of the organization which differ from the traditional approach by interpretation of reality according to a set of value memes of project managers are developed.

3. The method of competitive analysis of portfolio components for forming the composition of the value-oriented portfolio by generalizing the principles of value-oriented, and competitive approaches has been improved.

4. A conceptual model of the decision support system has been developed, which allows solving the problems of current management of the value-oriented portfolio of enterprise development, which differs in the presence of the preliminary stage of building value-oriented strategy and elaboration of its implementation through projects portfolio.

In the future, the author plans to continue studying the processes of value-oriented portfolio management in a behavioral economy, as well as to explore the nature and impact of the mental platform of organizations on portfolio components.

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