The innovative content of the components, stages, and results of the construction and implementation of the toolset, which provides a formalized assessment and choice of a rational scenario for reengineering implementation at a modern enterprise in the form of a target project, was displayed. The need for research is caused by the fact that the existing approaches to reengineering business processes in an application for construction enterprises require significant adjustments. The reengineering of a construction enterprise as a target project should be coordinated with the projects and works executed by a construction enterprise.

The proposed analytical support makes it possible to determine for each of the construction enterprises an alternative to reengineering adapted for its needs. Modules as part of the proposed analytical support implement a single algorithm of unambiguously formalized substantiation of the construction enterprise renovation project – through a developer reengineering project. This toolset allows rationalizing and adjusting decisions on the coordination of determinative characteristics of the above project – the essence of changes, their duration, estimated cost, investment stages.

The presented study provides a clearly formalized management technology for evaluating and selecting reengineering options, determining in advance the future benefits of reengineering transformations, namely, functional-technological, technological, technical, managerial, and economic changes. The created analytical support makes it possible to perform successful administrative support of a reengineering project. Its implementation will ensure an irreversible qualitative "jump" in the trajectory of the life cycle of an enterprise and expected strategic priorities

Keywords: reengineering of an enterprise, construction enterprise, reengineering project, information and analytical support, analytical modules to support a reengineering project

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DESIGNING A TOOLSET FOR THE FORMALIZED EVALUATION AND SELECTION OF REENGINEERING PROJECTS TO BE IMPLEMENTED AT AN ENTERPRISE

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1. Introduction

To ensure an adequate level of stability of the activity of an enterprise in the competitive environment, a construction enterprise at certain stages of its life cycle should apply to local or large-scale renewal programs (projects). The priority toolset for this renovation is reengineering. It is reengineering that ensures an accelerated, successful, and irreversible change in the state of functioning of an enterprise – through the implementation of a target project aimed at implementing the changes necessary for an enterprise [1]. Taking into consideration various functional types of reengineering (managerial, technological, cost, etc.), these types should be considered in terms of the integration of all means of enter-

prise resources and administrative efforts of management. Each type of reengineering should ensure the irreversibility of changes and qualitative growth of the competitiveness of an enterprise [2]. The priority component of reengineering is to ensure fundamental changes in the organizational structure of management and in the worldview of the management links of an enterprise [3].

The construction industry, even under conditions of crisis phenomena, maintains a certain balance [4]. Competitive executors are needed to create a product of the industry – infrastructural and residential facilities. In the dynamic operational field of functioning of enterprises-executors, the need to maintain competitive advantages for each of the enterprises-executors is a priority [5]. Operational and product features of a construction enterprise are significantly different from the course of business processes of industrial enterprises. That is why the application of traditional reengineering approaches [6] to the conditions of construction enterprises is not properly justified, both in scientific-methodological and applied terms.

Reengineering as a target project of the transformation of a construction enterprise is prepared by a special participant in the investment and construction process – engineering and consulting firms [7]. They assess the state of an enterprise, determine the urgency of reengineering, and then offer the management of an enterprise the options for a reengineering project.

The processes of the interaction of a construction enterprise with an engineering company as a reengineering developer require a separate professional justification. Despite numerous works on equal types of reengineering, this justification for such interaction is partially highlighted [8].

Separate components, aspects, and procedures that can be used as constituent elements of the digital, management platform are presented in papers [9]. However, these elements do not provide a holistic idea of the vector of integrated direction of the efforts of an enterprise and an organization-developer from initiating changes to summarizing the implementation of a reengineering project. The stages of joint justification of reengineering projects in the form of formalized toolset were not represented. The procedures for coordination of the reengineering content with the characteristics of the production cycle of a construction enterprise were not highlighted. The feasibility of the construction and implementation of this toolset into practice determines the target orientation of this scientific issue.

2. Literature review and problem statement

It was substantiated in paper [1] that the prerequisites for ensuring the success of the reengineering technology in conceptual terms are its combination with the ideology of the process approach to enterprise management. The transformation of the operational space of management tasks into a single information space was defined as a leading applied prerequisite for successful reengineering. Using the analytical toolset for the formation of the reengineering information space, the joint use of the CALS technologies, the means of economic and mathematical modeling, and the innovative management technologies in the "proper" format were separated. It was revealed in the paper that it would be appropriate to use digital and management technologies as auxiliaries of successful reengineering. The issues of structuring the reengineering processes into functional units and reengineering stages as a cycle of implementation of significant changes remained unresolved. The difficulties of applying the introduced approach to the reengineering of construction enterprises are due to the difference in the functioning of the operating systems of the latter from their counterparts at industrial enterprises.

The content of research in paper [2] is the implementation of reengineering in relation to business processes and the configuration of management systems for a franchise enterprise. Internet technologies, as well as a digital basis, were introduced in the processes of strategic and current management of an enterprise as an instrument for reengineering changes. The description of such implementation is accompanied by considerations about the significant qualification difficulties of "knowledge transfer". These difficulties are caused by the dynamics of Internet technologies and the need for "high-speed" competency updates for specialists implementing this format of reengineering. The implemented approach cannot be proposed for direct involvement in the practice of reengineering construction enterprises due to the multi-project nature of the activities of the latter. However, the content of the paper was aimed at making it possible to distinguish two leading stratagems in the process of formalization of reengineering for construction enterprises. The first one is determining the volume and depth of reengineering. The next one is mandatory multicriterial evaluation of reengineering options offered by consulting and engineering firms before the implementation at a construction company.

An innovative approach to reengineering is offered in paper [3]. In this paper, reengineering upgrading of an enterprise is presented as a specific "engineering work" on the reconfiguration and overhaul of the economic and management space of a company. The decisive key to successful reengineering is "re-designing" the organizational structure of enterprise management. The research creates the basis for the formation of functional subsystems of reengineering as a kind of "engineering complexes for overhaul" of an enterprise. The adaptation of the configuration and the content of such complexes under conditions of functioning of a construction enterprise remained unresolved.

Paper [4] deals with the search for rational ways of functional structuring of business renewal subsystems with the involvement of automated expert-modeling systems. This paper explores the advantages of introducing automated Enterprise Resource Planning (ERP) systems into the activities of construction companies. The possibilities of involving these decision-making information systems to find the key factors of success in the management of a construction enterprise and the environment of a construction project are studied in the research.

In article [5] reengineering is interpreted as a project of improvements aimed at obtaining significant specific advantages. Turning to reengineering as a tool for successful changes in work is associated with simultaneous enterprise's following the strategy of "meeting success factors" – "effectiveness", "mandatory situational ap-

proach", "keeping to the information society format", the balanced formation of "success components" of an enterprise. The paper does not answer the adaptation of analytical reengineering media to the conditions of a construction enterprise. However, it enabled recognizing the idea that the urgency of reengineering and the rational scale of changes should be agreed with the adjustment of the strategy at the stage of the "project pre-start". These adjustments can range from the "partial change strategy" to the "diversification strategy" and the strategy of "exiting from the occupied segment".

Research [6] contains a general management algorithm and "case" components of preparation and administration of reengineering processes as a specific project. The main factor in achieving strategic priorities of reengineering is seen in the detailed painstaking analysis of prerequisites and incentive motives for reengineering, and consistency and stratification regarding the sources of funding reengineering as a project are considered as those that require significant additional costs. The approach is not properly adapted to the conditions of construction enterprises. However, the priorities concerning incentive motives and sources of funding reengineering, identified here, should be taken into consideration when building a formalized toolset.

In research [7], the use of reengineering is considered as a combined means of preservation and improvement of competitive positions of an enterprise, information security, functional productivity, and manageability of an enterprise. A plurality of reengineering goals will be achieved due to the adaptability of reengineering tools and the wide application of information technologies in the management of enterprise renovation processes. The stages of reengineering determined in this paper, subject to certain adjustments, can be partially used to describe the interaction between a construction enterprise and an engineering company in the process of choosing a reengineering format and the purpose of its implementation. Analysis of the content of this paper led to understanding the importance of taking into consideration the multiplicity of reengineering goals when justifying the reengineering project of a construction enterprise. A separate analytical module as part of the toolset is aimed at multicriteria evaluation of reengineering options. The multiplicity of analytical criteria will ensure the multi-aspect assessment and substantiation of the choice.

The analytical approach proposed in paper [8] considers a wider range of issues than reengineering through combined analytical technology covering the problems of the processes of forming a portfolio of construction projects, coordination of these processes with the content of the life cycle of buildings, and the territory of development. The authors of the article present their approach to administration by updating business processes at an enterprise. The 4-level consideration of the strategic prospects for updating the content of business processes at an enterprise or in the environment of construction project management is innovative: from the level of "management flow perspective" to the level of "operational perspective". The components of functional stratification of renewal content presented in the paper were indirectly and partially used in the formation of the conceptual and methodological basis of the tools of reengineering of construction enterprises.

The approach to the formulated data description presented in paper [9] made it possible to determine the guidelines for constructing the contour of information and analytical support for reengineering for construction enterprises. The authors' proposals prompted the creation of tools in the form of the integration of modules that can be implemented at different "information hierarchy" levels within the framework of its functional, analytical, and administrative tasks.

Although paper [10] addresses the issues of reengineering in the Egyptian banking sector, it drew attention to the expediency of taking into consideration a number of subjective factors of reengineering of business process and enterprise administration system. Though the reengineering objects studied in the paper do not correspond to the specific features of the activities of construction enterprises, it will be advisable to take into consideration the latest micro-environment factors for reengineering. These factors include the commitment of top management to changes, the degree of using IT technologies (digitalization level), the centralization measure, and personnel involvement in decision-making.

Research [11] addresses the issues of improvement of methodological and analytic and applied project management tools as part of the developer company's portfolio. Analysis of the research led to the following conclusion. Despite the difference between the interests of developer companies and enterprise-executors in the same project, the entire reengineering cycle, rather than separate business processes of an enterprise, should be the object of administration for a construction enterprise. The characteristics of the cycle should be established and adjusted jointly by the top management of construction enterprises and companies that act as developers of reengineering at this enterprise.

Research [12] examines the reengineering modernization processes within digital technologies (Industry 4.0). The numerical algorithms proposed here describe the formalization of the replacement of the old production and product component with the new one due to the numerical solution of the Cauchy problem. For a construction enterprise, the use of the mathematical apparatus presented in the research turns out to be cumbersome due to the multi-project nature of the organization. However, the paper presented the reasonable idea that the production base of reengineering is the replacement of outdated manufacturing and product components with new ones. Under conditions of the operating system of a construction enterprise, the analogs of these components are works in the composition of construction projects that change each other as part of the production program of an enterprise.

The problems of setting up the principles and tools of reengineering for the task of updating business entities in the transport and logistics sphere are considered in research [13]. Rejecting the implemented system, it was stressed that it is necessary to ensure proper structuring of responsibility between all institutional entities of reengineering implementation. This specified requirement in this study as part of the conceptual and methodological basis is applied as one of the regulatory management principles regarding when it comes to a reengineering project.

Paper [14] explored the prospects for the implementation of transparent management at a construction enter-

prise. The affinity of the components of the developer's trust in the productivity of a construction enterprise and the image characteristics of an enterprise was recognized. The results and conclusions of this work gave grounds to introduce the "function of dynamics of a construction enterprise" as one of the objective functions by which options in reengineering are evaluated.

To rationalize the characteristics of numerical series, paper [15] used "the method for smoothing V-statistics based on Kaufman's Adaptive Moving Average". The algorithm presented in the paper was used to form weighted requirements for the development regarding strategic characteristics of the activities aimed at by a construction enterprise through the target reengineering project.

The method-applied approach reflected in article [16] focuses on modeling the information flows and a change in the organizational structure of management. The importance of changes in the organizational structures of an enterprise should be taken into consideration by an engineering and consulting firm, which makes a management examination of a building enterprise and after that determines the prerequisites for reengineering at this enterprise.

Paper [17] substantiates reengineering not only as a tool for overcoming crises but also as a basis for the implementation of "radically innovative strategies" and "the leadership preservation strategies". The determining factor of the success of the company's reengineering is its management modernization and updating of interaction with customers through the involvement of digital technologies, the format of artificial intelligence and robotics. It was determined that the conclusion about the urgency of reengineering and its economic advantages as an option for the implementation of "radically innovative strategies" at a construction enterprise should be provided by a consulting and engineering firm.

Paper [18] outlines the procedures for economic justification of reengineering and the criteria for its financial success for industrial enterprises. The content of the paper was directed to the decision to use the criterion of "expected net discounted added value" as a leading component of the vector of objective functions when substantiating the cycle of reengineering by toolset modules.

The performed analysis of the literature revealed that the existing approaches are not properly adapted to the conditions of activity of construction enterprises. Special attention should be paid to the formalization of the process of communication interaction between the management of construction enterprises and consulting and engineering firms regarding substantiation, evaluation, and choice of the best reengineering options.

The difference in reengineering implementation at construction enterprises is fundamental. At industrial enterprises, reengineering is implemented in the format of consistent implementation of the next stages. First, the activities on part of the operational space of an enterprise are suspended. Next, a reengineering project is implemented before new or upgraded facilities are launched. The target completion of a reengineering project for industrial enterprises is to reach the expected capacity of an enterprise. For construction enterprises, preparation and implementation of reengineering take place without interruption of the implementation of the own production program of an enterprise – activities in construction projects as an executor. This complicates the possibility of attracting traditional approaches to the needs of updating the activities of construction enterprises through reengineering.

Thus, it is urgent to create a toolset for formalized modeling and adjustment of the processes of interaction between management of construction enterprises and reengineering developers regarding the search for a rational reengineering option.

3. The aim and objectives of the study

The purpose of the research is to develop formalized information and analytical support for the implementation of reengineering as a target developer project at construction enterprises. Scientific innovations are the ability of the toolset to coordinate the urgency and content of reengineering of construction enterprises both with the stages of the life cycle and with the content of work performed by an enterprise in construction projects. The practical component is to provide the management of construction enterprises with convenient and reliable assessment and selection of reengineering projects.

To achieve the goal, the following tasks were set:

– to formulate conceptual and methodical components for adapting the content of reengineering to the needs to renovate construction enterprises, taking into consideration the conditions of functioning of the operating system of these enterprises;

– to develop an analytic and diagnostic module to detect the urgency of reengineering as a target renovation project for construction enterprises;

– to develop an analytical module to evaluate the variants (scenarios) of projects of construction enterprise reengineering;

– to devise the final component of the toolset in the form of a module for selecting the final variant of a reengineering project and its subsequent administration.

4. The study materials and methods

The object of the research is reengineering as a target project, the characteristics of which are subject to joint consideration by the management of an enterprise and a project developer – a consulting and engineering firm.

The hypothesis of the research is based on the following assumptions:

– expediency of inseparability of consideration of reengineering processes and processes of implementation by a construction enterprise of its production multi-project program;

– a consulting and engineering firm as a reengineering project developer performs an examination of the state of an enterprise and based on its examination reveals the urgency of reengineering, and then offers various project options;

– the presented variants of a reengineering project are jointly evaluated by the project developer and the enterprise that is to be updated.

The leading assumption of this paper is that separate business processes in the composition of reengineering are beyond this research. The entire reengineering cycle is subject to analysis and adjustment according to a special system of indicators that are acceptable for institutional participants of a reengineering project.

The following totality of research methods was used in the course of the study: systemic, structural-process and program-target analysis; functional and economic diagnostic, operational management and management of the configuration of operating systems of enterprises; cost-oriented management; fuzzy logic and scenario-game modeling. These methods were used to supplement the commonly used theoretical principles of business process reengineering. The described totality of the methods was first involved in the formation of a conceptual and methodical basis for the reengineering of construction enterprises. The following methods in the format of special modules were used to build the toolset for formalized substantiation of the cycle of developer management of reengineering at construction enterprises.

The practical implementation of the approach to the reengineering of construction enterprises is ensured through the use of a decision-making system oriented to the Windows software environment. Application packages, such as BSC indicator systems; PLM systems, BIM technologies, Big Data and IOT were used as components of the software environment for research purposes.

When forming this toolset, the requirement of the inseparability of the implementation of reengineering processes at a construction enterprise from the processes of the enterprise's production activities as an executor in construction projects was taken into consideration.

Separation of the innovative and investment components in the preparation of reengineering, recommended by existing approaches, were properly taken into consideration. When developing the toolset, various aspects and the integrated nature of responsibility for reengineering preparation, implementation and results were taken into account. The predominant responsibility for the innovative nature of the proposed reengineering activities at a construction enterprise is entrusted to the reengineering developer – consulting and engineering firm. It is this firm that must recognize the urgency of reengineering and through multivariate proposals for reengineering introduction prove its advantages as an innovation project. Highlighting the innovative nature of reengineering as a target renovation project for a construction enterprise is entrusted to the components of the tools described in chapters 5. 1 and 5. 2.

When it comes to the investment component of reengineering of a construction project, here solidary responsibility rests mainly on the top management of a construction enterprise and the management level of construction projects from the production program of an enterprise. By investing own and attracted funds in a reengineering project, the management of a construction enterprise and customers of projects within the production program of an enterprise must be confident that the leading reengineering directives are complied with.

Firstly, the productivity of the operating system of a construction enterprise should increase. Secondly, the implementation of reengineering projects will not cause any destructive damage to the projects from the enterprise program.

Thanks to the components of the toolset described in chapters 5. 3 and 5. 4, the investment component of a reengineering project – selection and implementation of the best reengineering variants as target investment objects – is taken into account.

5. Results of research into the development of the toolset for the introduction of reengineering at construction enterprises

5. 1. Development of conceptual and methodological components of adaptation of reengineering content to renovation needs of construction enterprises

When forming the reengineering concept, the definition of the "reengineering" category adapted to the characteristics of construction enterprises was provided. In addition to the specific features of functioning of the operating system of construction enterprises, when formulating the category, we took into account the mandatory coordination of the characteristics of the reengineering cycle with the progress of the creation of construction projects, in which the company acts as an executor of works.

Based on the positions of urgent updating of semantic content, stages, and regulations of reengineering, in this study, reengineering of a construction enterprise was defined by the authors as a "target development project for the rapid renovation of a construction enterprise". It is also appropriate to define reengineering of a construction enterprise as "a target current activity of reorganization of all management and organizational and technological subsystems of a construction enterprise, which takes place within the framework of the enterprise's implementation of its production multi-project program" [12, 14]. The implementation of reengineering of a construction enterprise should be carried out on the condition of constant monitoring and adjustment of the targeted reference points of a reengineering project. Monitoring is carried out using a hierarchically structured system of management-administrative, technical, technological, and resource indicators. The above-mentioned indicator system ensures control for the management of a construction enterprise and the organization regulating the progress of a reengineering project implementation as a developer. Due to this, there is a reliably balanced measure of confidence that time, resources, and management competencies involved in a reengineering project will be synergized. They will be used to achieve functional reengineering strategies – growth of functional and technological quality of work execution, reduction of resource intensity, enhancement of "executive" discipline, level of "maturity" and maneuverability of management decisions. This, in the end, will give an essential increase in the level of attractiveness of an enterprise in assessing potential customers and developers in construction. Thus, targeted reengineering for a construction enterprise is considered in this study as "a tool for the reorganization of ensuring the strategy of rapid and irreversible changes in the operational activities of the mentioned enterprise".

Based on this definition, the concept of reengineering a construction enterprise as a target project was developed (Fig. 1.). For construction enterprises, the concept determines 9 stages of reengineering, the result of which will be a complete or partial transformation of the nature of the process within the operating system of an enterprise. The implementation of all nine stages ensures a significant growth of the functional and executive capacity of an enterprise as an executor of projects in the market share occupied by an enterprise.

From the positions of the general concept of the project of target reengineering of a construction enterprise, presented in Fig. 1, the methodology for the formation of the target reengineering project for these enterprises was formed by combining the latest management approaches. Management, functional, technological, and value reengineering are combined with the project-target approach, functional and cost analysis, balanced scorecard (BSC), and other components (Table 1).

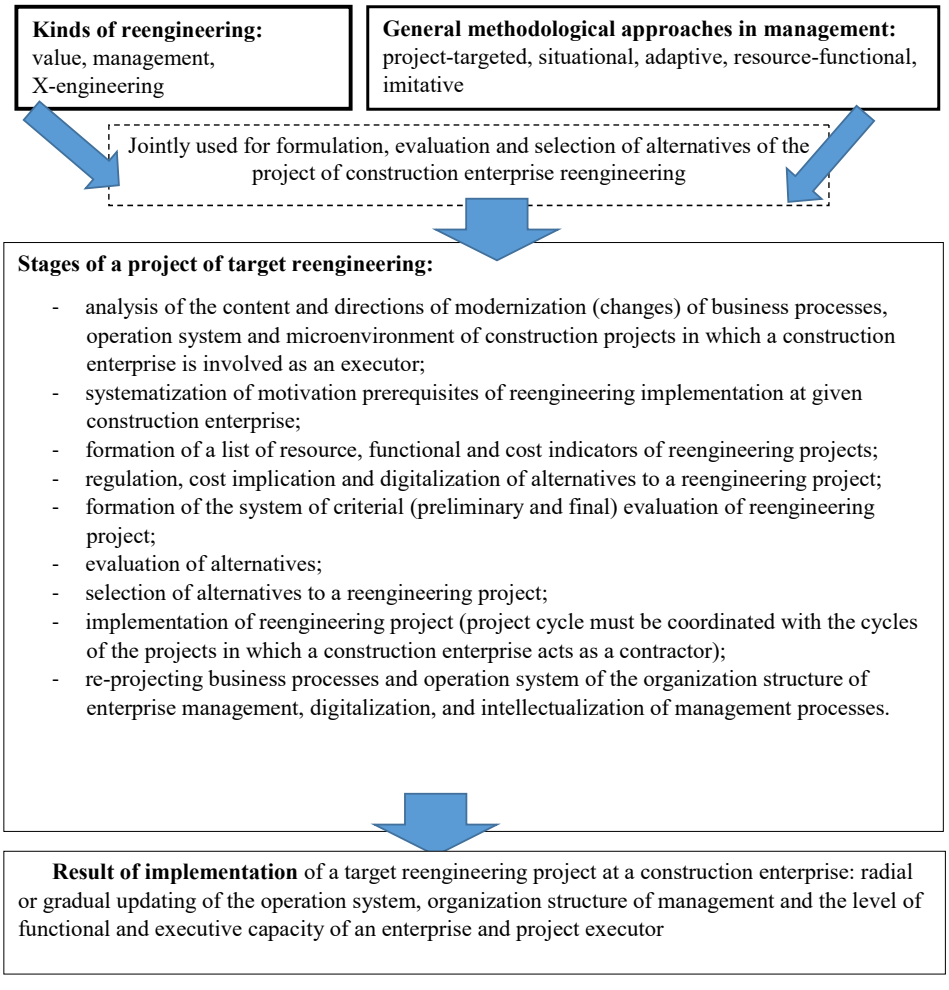

Fig. 1. The general concept of implementation of target reengineering at the construction enterprise

Table 1

Formation of methodological components for the implementation of reengineering projects at a construction enterprise

No. by order	Name of component of methodical basis	Interpretation of component
1	2	3
1	Definition of «the target project of construction enterprise modernization through reengineering» (TRCE)	1. 1. Adapted for this enterprise and the composition of its economic portfolio (construction or special works). Target development project of a change of the nature of business processes: it is carried out jointly by the construction enterprise management and a reengineering project developer. It involves re-projecting and modernization of functional-processing, preparatory and logistic, planned-budget, production and technical, resource and logistic, executive and administrative subsystems of the enterprise's operating system. Stages, management regulations, technological and administrative features of the given project at a construction enterprise require a special formalized environment and applied management tools, which is implemented in this study
2	Determining regulatory principles of a construction enterprise reengineering	2. 1. 5 principles of general management of construction enterprise and developer (executor) of reengineering project were determined: A. Compatibility and compromise on resource involvement. B. Target coordination of economic interests of project participants. C. Mandatory neutralization of demotivating external situational factors. D. Clearly structured legal, economic, and functional-executive responsibility between initiators and implementers of the reengineering project. E. Integration of stages and procedures of reengineering with the content of the production program of an enterprise, which is being rebuilt through reengineering
		2. 2. According to the vector of time updating: ensuring urgency, «inevitability» and the effect of «high-quality jump» in the implementation of innovations envisaged by a reengineering project
		2. 3. According to the vector of updating the organizational structure of management (USM) and enterprise administration processes: rational decomposition, decentralization in the course of administration of business processes at an enterprise, updated after reengineering. It is advisable to involve elements of the matrix, staff, and divisional arrangement in the updated USM. It is necessary to rely on such a composition of reengineering indicators, which will provide clear confidence in the company's adherence to the gradual progress of development and its acquisition of previously expected competitive advantages (within the target segment of executed works)

Continuation of Table 1

1	2	3
3	Basic methodological components	3. 1. Project-target approach – in the process of primary and final justification of reengineering, the management system of a reengineering project should ensure proper structuring (by executors and those in charge) of the stages, technical and managerial procedures of a reengineering project. All reengineering procedures should be coordinated with communication links, the composition of the internal environment, the course of business processes, and the resource potential of an enterprise. This approach is a forming component of the creation of «a goal tree» for a project of a construction enterprise reengineering
		3. 2. Value engineering, cost-oriented management, and balanced scorecard (BSC). All these components should be used jointly to build an extensive hierarchy of indicators, which formally describe the state of productivity: the operating system, the structure of the administration, and the composition of the portfolio (program) of construction work
		3. 3. General-methodical principles of consulting engineering and reengineering of business processes. Used for re-projecting operational, production, financial and economic, management and investment processes of a construction enterprise and a construction project (as the functioning environment of an enterprise). In order to enhance the executive discipline and «tender» attractiveness of an enterprise on the side of the leading construction participants – the initiator and the developer
		3. 4. Methodical approach of Earned Value Management is a widely used approach in project management and investment management. The advantage of its use is due to the ability to identify the leading cost-budget parameters for each current coordinate of the reengineering project cycle
		3. 5. Functional and cost analysis and analysis of strategic economic units. It makes it possible to adequately assess the contribution of the components of the operating system, subdivisions of the management organization structure and components of the economic portfolio of a construction enterprise (construction projects and works) as strategic economic units (SEU). The main purpose of this component is to direct reengineering to identify those components of the portfolio (business units) that «increase» or «decrease» the target (expertly evaluated) cost

Specificity of the general methodical, methodological basis of reengineering was formed so as to take into consideration the specifics of operational activities as a contractor of works in construction projects. Based on research [3–6], in addition to the general methodological principles (Table 1), the following applied principles of reengineering were additionally separated for construction enterprises:

1. The strategy of a construction enterprise should be unambiguously and clearly structured in a formalized way and described in operational terms and relevant analytical indicators of a project.

2. Ensuring transparency, better understanding, and enhanced communication of strategic goals.

3. Coordination of the trajectory of achieving the reengineering goals with the trajectory of the multi-project cycle of the economic portfolio (work program) of an enterprise.

4. Ensuring a clear distinction between the content of reengineering indicators for construction enterprises: proactive indicators and lagging indicators. Proactive indicators characterize the state and results of activities in the future. They allow the management to take the necessary corrective actions both to prevent (overcome) the actions of destructive factors and to intensify the actions that contribute to stabilization and development. Lagging (formal-historical) indicators make up the majority of indicators of public management reporting. The use of these indicators allows managers and analysts to assess the correctness of the chosen strategic course based on past operational activities, but in the context of the current situation. We should note the need to ensure a certain balance between forecasting indicators that can be used to describe such a state in the future, and historical indicators that record the achieved results.

5. It is necessary to rely on a rational balance between financial and other resource levers (administrative, information, etc.) in the system of reengineering a construction enterprise.

6. The strategic choice of reengineering options should be based on the strategic map of an enterprise. It includes a process-structured and visually analytical representation of causal relationships between components, resources, and the duration of reengineering. It is positioned as a target project for updating a construction enterprise with reliable managerial, functional, and technical consequences, designed on a reliable and clearly formalized basis.

Taking into consideration the opinions presented in [10, 11, 14], the content, stages, and resources of the developer reengineering project in the process of toolset formation were properly coordinated with the project and target direction of the operational system of a construction enterprise. This system needs to be updated and rebuilt. Therefore, each stage and a "decision-making node" in terms of reengineering is coordinated with the progress of execution of construction projects, in which the contractor is an enterprise that is renovated by means of reengineering.

5. 2. Development of a module to detect the urgency of reengineering as a target renovation project for construction enterprises

This module is one of the three modules of the scientific and applied toolset of the formalized substantiation of the variant of the reengineering project cycle for a construction enterprise. The toolset was built and organized as a decision-making system that integrates three modules MSR_1 – MSR_3. "Module of analytical support of reengineering of the construction enterprise".

The functional purpose of the MSR1 module is the actualization of the reengineering of a construction enterprise. According to the results of processing of the module of the state of business processes and the organizational structure of the researched construction enterprise, the management level of an enterprise should receive an answer to the ques-

tion: how productive the operational activity of a construction enterprise is. Each of the performed works as part of the production program of an enterprise is displayed by a separate reengineering model – in the form of a BIM segment connecting the initial and final event of the specified work. These models of works display the leading characteristics of activities determined by management as strategic activity indicators (Table 2). For each of the strategic indicators in the form of a special matrix of pre-start reengineering (Table 2), the level of meeting average for industry or individual requirements of a developer (initiator) was established. The level of deviations of the resource-executive and organizational-technological capacity of the executor enterprise from the strategic target values (Table 2) is one of the imperatives of the feasibility of reengineering as a renovation project for a construction enterprise.

Based on the data from Table 2 we can conclude that in assessing in the given paper, the expected strategic priorities in the activities of an enterprise as a component of the economic portfolio are minimal, thus the reengineering project is not urgent.

The next task of module 1 is to assess how successful the organizational structure is in the preparation and implementation of the enterprise strategy. At the same time, the organizational structure is considered a tool for administering its activities at all levels, subdivisions, and components of the enterprise's operating system. It is estimated how balanced, responsible, systemically and situationally adequate in solving the urgent problems of an enterprise the organizational and administrative apparatus of this enterprise is.

According to the results of the analytical procedures using the first of the modules, the management of an enterprise applying the score-content diagnostic scale (Table 3) should receive the estimates regarding primary characteristics of reengineering for this enterprise.

The first characteristic concerns the identification of timeliness of reengineering at the studied enterprise as a project of systemic changes. It allows assessing the prospects of using reengineering as a tool to counteract destructive factors and guarantee the return and strengthening of strategic positions in the market share occupied by it. The discrete scale of timeliness of reengineering was applied: "the state of immediate implementation", "urgent"; "with the possibility of a certain postponement"; "rational at the next stage of the life cycle of an enterprise". The second characteristic concerns identification of the required depth and configuration of changes that should be implemented at an enterprise via this reengineering project. The second characteristic corresponds to the following set of estimates – "partial changes", "wide coverage" or "complete transformation".

Table 2

The matrix for assessing the level of executive preferences of an enterprise as an executor of certain types of work in construction projects that is integrated into module 1 (fragment)

No. by order	Characteristics of indicators of the level of executive advantages of an enterprise	Expected result of execution of works by and enterprise, without considering reengineering measures	Measure of meeting requirements that are average for industry or strategic development requirements, in % of deviation from these requirements
1	Actual duration of execution of works by this enterprise, working days	404	–4.8 %
2	Actual duration of the logistic and preparatory period at the construction site, working days	87	+6.2 %
3	Cumulative actual duration of execution of work, working days (p. 1+p. 2)	491	–5.12 %
4	Actual estimated cost of work, minus VAT, thousand UAH	11139.14	–1.7 %
5	Administrative and managerial expenses as part of work budget, thousand UAH	2997. 61	–3.46 %
6	Share of expenses for wages (for all performers), thousand UAH	3088.03	–2.9 %
7	Actual material capacity of work as part of the estimated cost, thousand UAH	1479.6	+2.11 %
8	Actual operating costs of machinery	949.98	–4.62 %
9	Other expenses stipulated by the development agreement, thousand UAH	45.1	–
10	Estimated profit of the developer as part of work budget, thousand UAH	629.00	100 %
11	Total costs of an enterprise for this work as part of the estimated cost of work (the sum of lines 7–10), thousand UAH	8339.32	–
12	Actual profit of the company, separated in relation to this work (p. 4–11)	2499.82	–
13	Profitability of execution of construction works estimated for this enterprise, % (p. 12*100 %/p. 11)	29.97	3.43

Table 3

Assessment of urgency of implementing a reengineering project at a construction enterprise

Number of state	Measurement in points	Lexical measurement of the state of an enterprise as a performer on the side of the construction initiator	Assessment of the urgency of implementation of reengineering or other measures of enterprise renovation
1	From 0 to 4 not inclusive	Chaos and complete destruction	A company should leave this segment of the construction work market, strengthen the composition of assets, adjust to another industry segment via diversification
2	From 4,0 including to 9 not including	The state of dominant threats – «from rapid to slow fall into crisis»	The state of an enterprise is assessed as a rapid or slow approximation to the state of destructive. However, there are reserves for the resumption of the company's activities through reengineering. It is obligatory to combine a reengineering project with the wide application of sanitation actions and other analogs of «shock therapy», reconfiguring the organizational management structure. To ensure the success of the enterprise renewal as part of a reengineering project, actions should be taken to overcome resistance with changes on the side. It is necessary to rely on the implementation of innovative corporate culture and the complete redirection of the organizational management structure at all levels of the hierarchy. It is advisable to implement a combined strategy of «reduction» of some shares (segments) of the economic portfolio, «survival», «consolidation» and «gradual growth» of others
3	From 9,0 including to 14,0 not including	Shaky state of stability, probability of productivity of all subsystems of renewal of an enterprise is higher than the probability of falling into a threatening state	The company has significant potential for successful growth, first of all, by maintaining the manageability of an enterprise and readiness of all personnel to implement changes. Motivational basis and high corporate culture will contribute to the implementation of a reengineering project based on «full participation». Management should resort to reviewing linear, functional and staff links as part of the enterprise administration system, make decisive changes in the composition of the components of the economic portfolio (work programs) performed by an enterprise. Strict revision of the economic structure of the economic portfolio and preparation of possible strategies to counteract destructions
4	from 14,0 including to 18,5 including	Slow growth, a slight probability of loss of balance by an enterprise	After long-term expertise, a company may recommend separate situational and adaptation steps on certain changes in the administration system and the structure of the program of executed works
5	From 18,5 including to 21 including	Reliability of an enterprise as an executor exceeds the requirement that is average for industry, on the part of project initiator, the image is «the highest trust»	Reengineering and other corrective actions are not required, it is recommended that the management of an enterprise continue the strategic course for aggressive growth in the selected segment of market of construction or special works

5. 3. Devising an analytical module to evaluate variants of reengineering project of a construction enterprise

The analytic and diagnostic module MSR_2 substantiates the next stage of implementation of a reengineering project – evaluation of alternatives. The use of this module will provide formalized execution of procedures 1–3.

Procedure 1. The initial evaluation of alternatives to reengineering project alternatives is performed. Based on the conclusions of the previous module, an assessment of those options for renovation of an enterprise through reengineering is provided by a consulting and engineering firm as a reengineering developer. According to the joint conclusion of the management of an enterprise and representatives of a reengineering developer, the projects that are realistic and economically feasible for the conditions of a construction enterprise are considered. The functional and technological, innovative and technical, organizational and managerial needs, the recommended content of innovations, and the configuration of changes determined by the previous component are considered.

Procedure 2. Multi-criterion evaluation of indicators of the content of previous technical and economic substantiations, initial estimates, and other documentation of these projects is performed at the "pre-preparatory" stage ("initiation" stage).

For each of the variants of the reengineering project, the vector (set) of target functions is sorted. Each of the functions in the form of a special econometric dependence provides a description of the course of the reengineering cycle and the results of the cycle – for the conditions of an enterprise. The target corrective function {Tf} as part of the target functions {Tfm} is the net added value of a reengineering project that corresponds to a certain variant of the project, expected within estimated duration {Tf1}. As target functions, vector {Tf1} includes the values of indices of the growth of results of the company's operating system, which are forecasted as a result of transformations of a construction enterprise after reengineering. As target functions, the growth index is forecasted in relation to the following indicators of an enterprise: the volume of property and sources of their formation; financial result from the use of property; characteristics of financial stability and solvency. The independent variables of the target functions are three groups of parameters differentiated (calendared monthly) during the reengineering cycle.

The parameters of the first group include estimated costs, expected amount of net cash flow; resource transfer of the property rotation by an enterprise as a result of a qualitative update of the performance indicators of an enterprise, which is expected as an outcome of a project of reengineering of a construction enterprise (PRCE).

The second group of parameters of the first group includes structure, resource transfer, financial stability, and liquidity of qualified assets of an enterprise.

The third group of parameters includes values of probabilities for separate characteristics of a reengineering

project, which are determined based on the involvement of random selection algorithms and stochastic modeling tools:

$$\{Tf(h)\}=\{Tf_1(h),Tf_2(h)....Tf_\beta(h)...Tf_{12}(h)\}, \quad (1)$$

$$Tf_1 = DQ^{(+)}_{disc} - BI^{(-)}_{disc}, \quad (2)$$

$$DQ^{(+)}_{disc} = S_{t2}\left[q_2 * DDQ^{(+)}(t_2)/(1+l)^{t2}\right];\ t_2=[t_D; t_{out}], \quad (3)$$

$$BI^{(-)}_{disc} = S_{t1}\left[BI^{(-)}(t_1)/(1+l)^{t1}\right];\ t_1=[t_{on}; t_{out}], \quad (4)$$

$$Tf_2\rightarrow\min;\ Tf_3\rightarrow\min;\ Tf_4\rightarrow\max, \quad (5)$$

$$Tf_5=AR_5/BR_5....Tf_{11}=AR_{11}/BR_{11}, \quad (6)$$

$$EL\rightarrow Tf_{12}, \quad (7)$$

where h is the number of variant (scenario) of a reengineering project from N projects presented for consideration by a developer and selection of top-management of a construction enterprise: h=1, 2, ...N;

$\{Tf(h)\}$ is the vector of target function for a certain reengineering scenario (Table 3);

b is the ordinal number of the function-component as part of target function $\{Tf(h)\}$; b=1, 2, ...11;

$Tf_\beta(h)$ is the component with ordinal number as part of vector $\{Tf(h)\}$;

t_{on} is the temporal coordinate which distinguishes the moment of the beginning of a reengineering project for a given enterprise;

t_D is the term of expecting the beginning of additional revenues as a reengineering result;

t_{out} is the temporal coordinate which marks the moment of finishing the reengineering cycle for a given enterprise;

t_1 is the temporal coordinate of investment of a reengineering project;

t_2 is the temporal coordinate that tracks the course of receipt of the net cash flow of the reengineering project;

$DDQ^{(+)}(t_2)$ is the value of the increase in net cash flow expected as solely the outcome of non-engineering innovations at a construction enterprise, calendared at the moment of the project cycle t_2;

$BI^{(-)}(t_1)$ is the value of investments in the reengineering project, or part of the project budget for multiple current moments of time, monetary unit, calendared at the moment of the project cycle t_1;

l is the discount norm, unity share;

$(1+l)^t$ is the discount denominator at the ratio of investment time and net cash flow;

EL is the scale of the score-linguistic dimension for assessing the image of an enterprise;

Tf_1 is the determining component as part of vector $\{Tf(h)\}$ – the net added value of a reengineering project. This component as the difference of the volume of additional net cash flow and investments discounted at the same current moment of the project cycle;

Tf_2 is the budget total (consolidated estimate) of a reengineering project, monetary unit;

Tf_3 is the proposed lending volume, monetary unit;

Tf_4 is the share of own sources of an enterprise in project investment, %;

Tf_5 is the component of detection of the expected value growth of the economic portfolio of an enterprise (volume of executed works), units;

Tf_6 is the component of detection of the increase in financial result of an enterprise, units;

Tf_7 is the component of detection of changes regarding costs of administering an enterprise, units;

Tf_8 is the component of changes in the speed of using the working capital of an enterprise, units;

Tf_9 is the component of changes regarding the production profitability in totality throughout the entire annual program of works, units;

Tf_{10} is the component of changes regarding realization profitability, units;

Tf_{11} is a component of changes regarding the level of distance from bankruptcy by the measure of net working assets in the total value of capital of an enterprise, units;

Tf_{12} is the component of expected changes in the image of an enterprise as an executor of construction work on the side of the initiator and involved independent experts. The score-linguistic estimate "significant image growth and enterprise manageability in initiator's evaluation" of 12 points corresponds to state EL-1. The state EL-2 means "significant image growth" of 8 points. The state EL-3 corresponds to the estimate "the image of an enterprise is slowly growing" – 5 points. State EL-4 is rated at 3 points, meaning "the image growth is not clearly distinguished". State EL-5 is the worst in relation to the image, it is identified by a score of 1 point, "the image level decreases". The values of Tf_5–Tf_{10} components are calculated as relative indices through the ratio of the value of the variable at the time of the "post-reengineering" year AR to the values of the previous year BR, in part of the duration of which the reengineering project was carried out;

q_1, q_2 are the coefficients that consider the stochastic character in the flow of reengineering processes: $q1$ – regarding investments, q_2 – regarding net cash flow of a project;

S_t is the display of the procedure of algebraic total of the processes of a reengineering project, with separating at the t-th current moment of a project cycle.

5. 4. Formation of a module for the selection of the final reengineering variant and its subsequent administration

The final MSR_3 module as part of the toolset ensures the procedures for selecting the final variant of the engineering project, its subsequent budgeting, and administration. This module implements the final calculation procedures as part of the toolset. A fragment of the procedures for evaluating alternatives of the reengineering project for the "Alfa-Service" company is presented in Table 4.

a) determining RG_β ranks of the comparative importance of components Tf_β as part of 12 components of vector Tf (the lowest rank is 1, further, the importance rank is determined as the index to the least important);

b) ensuring the order of assessing the scenarios of reengineering projects and their ranking by certain b-criteria;

c) formation of $\|RM_\beta\|$ – the matrix of comparative ranks of scenarios of reengineering projects in the estimate according to separate criteria;

d) formation of $\|RM_{add}\|$ – the matrix of additive priority regarding scenarios of reengineering projects. It is formed as the sum of the products of matrices $\|RM_\beta\|$ and the values of ranks RG_β;

e) execution of procedures for selecting the final reengineering scenario by maximum value $\|RM_{add}\|$; selection of a value engineering project according to the project priority

– the maximum of the aggregate rank. The priority increases in descending order by the position among the total number of scenarios. The highest priority 1 corresponds to the maximum value of additive priority – the sum of the matrix by the line, the ordinal number of which corresponds to the number of the project scenario;

f) joint implementation of actions of the management of an enterprise and the company providing engineering services on adjustment in the selected variant of a reengineering project: calculations for certain types of work, the total budget; management regulations and work execution schedule.

The modules of the reengineering complex described in the article allowed the company's management to choose a project with rational characteristics and, in the future, successfully coordinate the implementation of this project with the production program performed by an enterprise.

6. Discussion of results of research regarding the formalized toolset for evaluation and selection of reengineering projects

The obtained outcomes are the result of a revision of the reengineering concept and its adjustment to the specific features of activity of the construction enterprise.

When solving the first problem, the research into conceptual and methodical components of reengineering was aimed at the specifics of functioning of the operating system of these enterprises. Taking into consideration the opinions outlined in [10, 11, 14], the content, stages, and resources of the developer project of reengineering in the formation of toolset were properly coordinated with the design and target direction of the operational system of a construction enterprise. Instead of the traditional focus on changes in business processes, we proposed the concept of reengineering a construction enterprise as a target project. This required the involvement of new research methods (Fig. 1), in particular, a combination of managerial, functional, technological, and value reengineering with a project-target approach, functional and cost analysis, a balanced scorecard (BSC), and other components (Table 1). Most approaches to reengineering focus on the content of innovations in the course of business processes and the configuration of the enterprise administration structure. The innovativeness of the implemented approach is that it focuses on the fundamental moments of interaction between a construction enterprise as an initiator of reengineering changes, and a consulting and engineering firm that offers the company reengineering scenarios. When applied to the conditions of construction enterprises, reengineering is positioned as an urgent renovation project. It was determined that the prerequisites for reengineering are destructive tendencies regarding the trajectory of the life cycle of an enterprise. Such destructive tendencies are defined as a loss of comparative competitiveness of the executor of works in construction projects, loss of manageability, image losses, and emerging of other crisis (pre-crisis) phenomena in the course of the enterprise operation.

Table 4

Final evaluation of reengineering project scenarios in the process of their selection for implementation by a construction company

J, no. of criterion	Analytic criteria	Units	Values criteria of a reengineering project		Project priority according to local criterion among all studied alternatives under study (in relative evaluation)	
Tf_1	Estimated present value (net discounted income) of the evaluated scenario of engineering project scenario	thousand UAH	4655.2		1.21	
Tf_2	Budget total (consolidates costs)	thousand UAH	1045.72		1.091	
Tf_3	Expected estimated volume of project lending	thousand UAH	723.01		1.042	
Tf_4	Autonomy level in investment sources	units	69.14		1	
Tf_5	Estimation of expected value increase in the volume of executed works	index	1.288		1.008	
Tf_6	Evaluation of chaënges (growth) of the financial outcome of an enterprise from the main activity, next year relative to current year	Index	1.138		1.041	
Tf_7	Detection of changes (reductions) in costs of enterprise administration	index	0.938		1.11	
Tf_8	Index of changes (growth) in the rate of using working capital of an enterprise, next year relative to the current year	Index	1.386		1.053	
Tf_9	Detection of changes in production profitability collectively throughout the annual program of works, units	index	1.386		1.053	
Tf_{10}	Detection of changes in profitability of the implementation of the next annual program of the company's work in relation to the current program	index	1.196		1.072	
Tf_{11}	Detection of changes in the level of distance from bankruptcy by the measure of net working assets in the total value of the company's capital	Index	1.4733		1.19	
Tf_{12}	Image evaluation	Score	12		1	
H	Sequence number of the scenario of reengineering project among cumulative alternatives				2	
$RM_{add(h;2)}$	Line of the matrix of additive priorities showing the cumulative priority of the given reengineering scenario (=2) among other variants	1.067	1.0	1.072	1.135	1.094
LR	Level of priority of reengineering scenario among others				1	

A reengineering project for a construction enterprise is defined as a development project that requires lengthy and phased substantiations. However, first of all, it demands readiness and capability to significantly modernize management thinking, modernization of the management system, changes in the structure of resources and their maneuvering.

That is why when solving the second task of the study, an analytical apparatus was provided to formalize the decisive stage of reengineering (analytical module MSR1). This stage concerns monitoring the state of a construction enterprise (Table 2) on the side of a consulting and engineering firm and detecting the urgency of a change project via reengineering (Table 3). The result of this step initiates the following actions. The management of a construction enterprise decides on the need for reengineering, and a consulting and engineering company develops options for a reengineering project, which is submitted for consideration to the management of an enterprise.

The outcome of solving the third task of the study is the development of support for the processes of choosing a reengineering option for a construction enterprise that needs to be renovated through reengineering (analytical module MSR2). To evaluate reengineering variants, the module provides a system of target functions. Each of the functions within the proposed target reengineering variant reflects expectations for a separate aspect of the growth of productivity of the operational activity of a construction enterprise (formulae (1) to (7), procedures 1–3 in chapter 5. 3.).

To solve the fourth, final, task of the study, the fourth analytical module (MSR3, Table 4) was developed, which, as part of the toolset, ensures the procedure of selecting the final variant of a reengineering project, its subsequent budgeting and administration.

The advantages of the introduced approach to reengineering are as follows:

1. It ensures distinct focusing on the specific features of activity of a construction enterprise, which should select and implement a reengineering project as a target project, at the same time performing its production program in several projects as an executor.

2. The toolset reflects the rational distribution of responsibility in the relationship between a construction enterprise and the developer of a reengineering project. For the reengineering developer, the toolkit distinguishes unambiguous criteria for the urgency of reengineering. For the joint use of a reengineering developer and a construction enterprise, which needs renovation, a formalized apparatus for joint consideration, evaluation, and selection of the reengineering scenario was developed, which largely eliminates subjectivism of solutions.

3. The content of the consideration is separate business processes of reengineering, and the reengineering cycle acts as a project of "breakthrough strategies". The management of a construction company assesses the future aggregate preferences of the project in general while detailing the content of separate procedures relies on a consulting and engineering firm as a reengineering developer.

The format of the proposed approach is characterized by certain restrictions. These restrictions are due to the following factors:

1) the measure of readiness of the management of a construction enterprise for changes, first of all, for a change in strategic thinking, the necessary changes in the organizational structure, for redistribution of powers, for situational and adaptive management and other innovations;

2) readiness of a consulting and engineering firm as a would-be developer of the reengineering project for a properly detailed examination of the state of an enterprise. Some shortcomings in the examination of various subsystems and elements of the operating system of an enterprise can significantly affect the source data of the "pre-start project" and lead to false decisions about the urgency and scale of reengineering;

3) the level of mutual understanding and readiness for cooperation between project stakeholders. A consulting and engineering company should offer not only the most expensive alternatives to the implementation of the reengineering cycle. In the process of choosing reengineering options, a construction enterprise should realistically evaluate both sources of investment of such a project and the readiness of personnel for innovations.

One should recognize that the fact that the choice of the reengineering variant is the responsibility of the management of an enterprise is a certain drawback. This fact can negate all the merits of the introduced approach in assessing and choosing reengineering options.

For further development of the implemented approach, it may be advisable to make its further adjustment in the following way. After coordination of the procedures for evaluating and selecting reengineering variants, the decisive issue is the formation and adjustment of the integral model of the life cycle of a reengineering project. It would be appropriate to include network models, lifecycle structuring models in the methodical components of the study in order to create a comprehensive graphic-analytical model to support a reengineering project. It is advisable to present the elements of the cycle in the form of a fragment of the network model in the format: "a node" – "an element of the reengineering cycle" – "a node". The integrated model of the cycle will be an oriented graph that integrates multidirectional "elements" but is implemented from the initial "node" to the "final" node. To construct such a model of the reengineering cycle administration, it is advisable to combine applied decision-making packages provided by universal approaches in a single formalization system: network planning and administration of "Activity-on-the-arc", PLM-modeling, SADT-modeling. A promising way to improve the approach is to expand the system of diagnosing the urgency of reengineering and the depth of the change determined by the first module MRS_1.

The greatest difficulties that can accompany the process of improving this study are the difficulties of integrating heterogeneous decision-making packages into a single algorithm and, accordingly, finding a criterion for the rationality of the integrated model of the reengineering cycle.

7. Conclusions

1. It was substantiated that the existing approaches to reengineering when applied to the conditions of activity of construction enterprises require adaptation, adjustment and updating. The main purpose of such adaptation is to improve the existing conceptual and methodological basis and its coordination with the specific features of the multi-project

nature of the activities of construction enterprises. The methodological basis was formed by supplementing the general methodology of reengineering with the principles of process-structured management, project-target, cost-oriented, and functional-value approaches in management together with modern management and digital technologies. This basis ensured the development of the toolset for the implementation of reengineering, which takes into consideration the peculiarities of the administration system and the multi-project nature of production at construction enterprises.

2. To detect the urgency of reengineering as a transformation project for a construction enterprise, an analytic and diagnostic module as the first component in the presented toolset was created. The primary procedures of this module ensure the preliminary comprehensive diagnosis of the state of an enterprise within the estimated term (3–5 years) by a consulting and engineering firm as the reengineering project developer. Diagnosis is multi-aspect, comparative (in comparison with the standard requirements of initiators of projects rather than with enterprises- analogs). Then the results of the aspect-by-aspect comparative evaluation of an enterprise are transformed into a two-dimensional score-lexical identifier of reengineering prerequisites for this construction enterprise. The value of this identifier for the developer of a reengineering project is a grounded and clearly formalized reason whether to recommend a reengineering project to the studied enterprise or not. In case of detecting the urgency of reengineering, this identifier determines the "scale" of changes recommended for an enterprise – from separate adjustments of business processes to complete restructuring of the operating system and strategic diversification. The final procedures of the module are to separate the content of innovations and expected specific advantages that the company should receive after the introduction of innovations as part of a reengineering project.

3. The second analytical component (module) in the toolset is intended for multi-criterion evaluation of scenarios (variants) of the project organization and the passage of the reengineering cycle at the construction enterprise. To evaluate the variants of reengineering projects, a field of 12 formalized criteria presented as target functions was proposed. Each of the target functions through the composition of arguments takes into consideration the specifics of the life cycle of a construction enterprise in a multi-project economic portfolio. The obtained values of the target functions in their aggregated consideration give a proper and conveniently visualized idea of the merits, as well as of the possibilities for increasing the productivity of the management of activities and obtaining competitive advantages expected by an enterprise under a certain variant of the reengineering project.

4. The final toolset module ensures a choice of the scenario for passing the reengineering project cycle with the use of a matrix of additive priority. The set of procedures applied by the module allows the management of an enterprise to consider the chosen scenario as compromise-rational and most adapted for the conditions of this construction enterprise.

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