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**SYSTEM UPDATE OF THE OPERATIONAL-ANALYTICAL  
APPROACH TO BUILDING MANAGEMENT IN THE FORMAT OF  
BUSINESS PROCESS REENGINEERING**

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*The article introduces and substantiates the applied tools for formalizing the corresponding complex target program for reengineering business processes of domestic contracting enterprises, which on the new criterion-factor platform forms the optimal composition of the business portfolio and takes due account of the factors of the external and internal environment of the developer's activity, modern economic and mathematical tools solutions and advanced management concepts of the business portfolio. The technology of evaluation and selection of options for business process reengineering at contractor construction enterprises is presented, the content of which is adapted:*

*- to the content of the operating activities of the developer as one of the leading subjects of the construction and investment process;*

*- the nature and structure of the developer organization operating in the multi-project business environment as an administrator, coordinator and regulator of the initiation, preparation and implementation of construction investment projects.*

*Keywords: reengineering of business processes, management, contract construction company, simulation modeling, economic-mathematical model.*

*кандидат економічних наук, Рижаків Д. А. Системне оновлення операційно-аналітичного підходу управління будівництвом у форматі реінжинірингу бізнес-процесів / Київський національний університет будівництва і архітектури, Україна, Київ*

*У статті запроваджений та обґрунтований прикладний інструментарій формалізації відповідної комплексної цільової програми реінжинірингу бізнес-процесів вітчизняних підприємств підрядного будівництва, що на новому критеріально-факторному ґрунті формує раціональний склад господарського портфелю, який належно враховує чинники зовнішнього та внутрішнього середовища діяльності девелопера, сучасні економіко-математичні інструменти прийняття рішень та передові концепції з формування та менеджменту бізнес-портфелю. Презентовано технологію оцінювання та вибору варіантів реінжинірингу бізнес-процесів на підприємствах підрядного будівництва, зміст якої адаптовано:*

- до змісту операційної діяльності девелопера як одного з провідних суб'єктів будівельно-інвестиційного процесу;
- до характеру та структури організації-девелопера, що діє в мультипроектному бізнес-середовищі як адміністратора, координатора та регулятора процесів ініціації, підготовки та впровадження будівельних інвестиційних проектів.

**Ключові слова:** реінжиніринг бізнес-процесів, управління, підрядне будівельне підприємство, імітаційне моделювання, економіко-математична модель

кандидат економічних наук, Рыжаков Д. А. Системное обновление операционно-аналитического подхода управления строительством в формате реинжиниринга бизнес-процессов / Киевский национальный университет строительства и архитектуры, Украина, Киев

В статье введен и обоснован прикладной инструментарий формализации соответствующей комплексной целевой программы реинжиниринга бизнес-процессов отечественных предприятий подрядного строительства, который на новой критериально-факторной платформе формирует оптимальный состав хозяйственного портфеля и должным образом учитывает факторы внешней и внутренней среды деятельности девелопера, современные экономико-математические инструменты решений и передовые концепции менеджмента бизнес-портфеля. Представлена технология оценки и выбора вариантов реинжиниринга бизнес-процессов на предприятиях подрядного строительства, содержание которой адаптировано:

- к содержанию операционной деятельности девелопера как одного из ведущих субъектов строительно-инвестиционного процесса;

- характера и структуры организации-девелопера, действующей в мультипроектной бизнес-среде как администратора, координатора и регулятора процессов инициации, подготовки и внедрения строительных инвестиционных проектов.

**Ключевые слова:** реинжиниринг бизнес-процессов, управления, подрядное строительное предприятие, имитационное моделирование, экономико-математическая модель.

**Introduction.** In modern practice of management of enterprises is increasingly gaining the operational and analytical approach to building management in the format of *Business process reengineering* (abbreviated BPR) - an administrative style in which managers focus on the circumstances and results of activities that are significantly different from what was expected and planned (planned indicators). It's goal is to

help provide top management with the opportunity to focus on truly important tactical and strategic tasks. In BPR, decisions that can not be implemented at one level of management are transmitted to the next, higher level. In the management system of an industrial enterprise, BPR is at the same time an integral part of quality management, operational management and ongoing control.

Unfortunately, in the system of preparation management, economic substantiation and administration of construction projects, the management of deviations did not become widespread due to the lack of any methodological and applied developments in this area, primarily because of impossibility and inadmissibility of attracting traditional techniques of BPR to the practice of contracting construction and to the content of management of construction projects as specific investment objects. This formulation of the problem inevitably updates the need to develop a number of specific business models to be used by decision makers as a means of preventative (analyzing) the probability of deviations taking into account the impact of the micro-environment factors of the project and its stakeholders, as well as a means of their further minimization and elimination.

The multitude of domestic and foreign scientists have made a significant contribution to the study of organizational foundations and scientific and methodological approaches to the implementation of reengineering concepts at all stages: from design to performance evaluation [1-3]. Methodological approaches to the assessment of the effectiveness of business process reengineering are considered in the scientific papers of D.O. Chernyshev [4]. Algorithms for implementing reengineering projects are disclosed in the works of O.V. Vynogradova [5], L.M. Taranjuk [6]. The assessment of the business potential of production systems is discovered in the research of V.P. Korinev [7]. The assessment of the impact of business potential and its components on the production system are studied in the works of V.O. Pokolenko [8].

**The purpose of the article** is to formulate methodological and analytical requirements for the introduction and construction of tools for organization of construction and technical and economic support of construction projects on the basis of reengineering.

**Presenting main material.** Reengineering is a new philosophy of management focused on business processes, it is not just one of the ways to successfully develop entrepreneurial activity, it is a new way of thinking, a look at creating a company as an engineering activity, and this is a complex process that requires an integrated approach.

When forming modern BPR instruments as components of the system of indicators of production efficiency, production, economic and commercial activity of the enterprise it is desirable to adhere to certain principles. These include: 1) ensuring the relationship between the

criterion and the system of specific indicators of production efficiency; 2) display of efficiency of use of all types of used in production resources; 3) the importance of applying indicators of efficiency in the management of various levels of production at the enterprise; 4) execution of the most important indicators of the stimulating function in the process of using existing reserves to increase the efficiency of production, one or another type of activity of enterprises.

The system of indicators of crisis management, built on the basis of certain principles, should include several groups: 1) generalizing indicators of production efficiency (enterprise activity); 2) indicators of efficiency of labor use (personnel); 3) indicators of the efficiency of the use of production fixed and working capital; 4) indicators of the efficiency of the use of financial resources (working capital and capital investments). Each of these groups covers a certain number of specific absolute or relative indicators that characterize the overall efficiency of production (enterprise activity) or the efficiency of the use of certain types of resources. The absence of this property may lead to an inadequate response to destructive situations that adversely affect individual stages of the life cycle during the implementation of a construction project and potentially or indeed may cause the destruction of the entire production and economic structure of the enterprise.

The basis of many modern methodologies for business process modeling in reengineering projects is the SADT methodology, the IDEF family of standards, and the algorithmic languages used to develop software. Recently, several types of methodologies, such as Business Process Modeling, are used to describe, simulate and analyze business processes; Work Flow Modeling; Data Flow Modeling.

Among the methodologies for business process modeling, the most common is the methodology for describing business processes - the standard IDEF0. The model consists of diagrams, text fragments and a glossary. Diagrams are represented as blocks and arcs, in which there is clearly no sequence or time. This method is complex in perception and there are difficulties in linking several processes. Today, the development of the IDEF0 methodology is associated with the improvement of its supporting tools - software products for business process modeling (for example, BPWin, ProCap, IDEF0 / EM Tool, etc.).

To simulate top-level processes, the so-called "matrix" modeling is also used, which allows us to classify, describe and optimize the business processes of an enterprise. The matrix model is formed as a crossing of processes and subsystems, which creates the tasks necessary for the enterprise. The peculiarity of this model lies in the fact that the formed matrix for the enterprise creates the task of the level of the organizational unit, which can then be grouped according to both functionality and market or process principles.

In general, there are three approaches in the literature to the formation of top-level business process modeling. The first approach focuses on a detailed description of the sequence of actions conducted by the employees to achieve the result and reflected in the model of Oracle Business Models (OBM). The construction of such a model and its use is used as a tool when working on a project implementing the ERP system at a large enterprise, comparing existing and future business processes. However, the enterprise is described in terms of functional activity, that is, when decomposition of the model, business processes and operations are described as activities assigned to different functional units and specialists, and this violates the main unambiguous principle of reengineering.

The second approach allows you to synthesize business processes of the enterprise and group work. The peculiarities of such models are the clear aggregation of work "on the result" and the precise execution of the same principle of process management. As a result, it is possible to reduce staff, to optimize the activity of the enterprise, to provide transparency to the management of the enterprise. However, the introduction of rigorous requirements for the qualification of performers and due to the high abstraction of principles and concepts in the model, there are difficulties in its development for the enterprise.

The third approach, based on the described Portal of the value chain, highlights processes as a consistent contribution to creating a product that is designed to find competitive advantages. However, the model is still more demanding, serving exclusively to understand the essence of the enterprise.

In practice, DFD (Data Flow Diagramming) notations are actively used, which are intended to describe the flow of data, that is, they represent how each process converts its output to the result. Thus, the DFD allows you to display the sequence of work performed in the process and the flow of information circulating between these works. In this case, the DFD note provides the opportunity to describe the flow of documents and material resources. This methodology is effectively used to describe processes in implementing a process approach to enterprise management, since it minimizes the subjectivity of describing business processes.

**Conclusions.** The article considers the prerequisites for updating the modern paradigm of technical-economic and organizational-technological planning of construction production in accordance with the modern understanding of providing integrated reliability as a multiplicative flow of a set of key indicators of the project and the creation of methodological bases for designing, calculating and implementing development projects of construction on the basis of BPR.

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