The process and project approach as the basis for harmonization of development management system of a construction company

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Abstract. The article is devoted to development of theoretical positions as well as methodical and practical base for increasing the efficiency of cost management of construction project realization. The modernized organization and economic mechanism of formation and cost management of the construction project realization is proposed. This mechanism is determined as integrated system of planning and control for the cost of construction project realization. The main directions of harmonization of components of company’s development due management system due to the process and project approach that combines advantages of value-oriented management and methodology of project management are indicated.

1. Introduction.
There is an active search for adequate and effective mechanisms of companies’ development in science of management. Study of the wide range of scientific works [1-12] allows seeing a huge variety of theoretical and methodological points of view about development management of construction company. The deficiency of systematic researches of use of different models and development concepts, interaction and interdependence between various management technologies determines the necessity of forming the mechanism for focused management efforts to ensure quality and irreversible systematic changes in company.

Modern researches in field of process management show complexity of management system development. Elements of the process management are integrated with the methodology of strategic management, balanced system of indicators, customer management system and benchmarking creating powerful potential of quality improvements in company [1-4].

An alternative development management approach is the project methodology. Appearing and wide use of the project methodology has necessitated the concentration of efforts at the achievement of determined results of development. Thus, the management of development by realization of projects has turned into in come that help organizations to implement their business plans and achieve strategic orienteers of activity [5]. The popularity of the project approach in practice of development
management is conditioned by result orientation (value added, product). Nowadays, development projects are recognized as agents of strategic changes and in fact, they penetrate all elements of the enterprise system [6-8], and methodology of the project management becomes the key to effective implementation of any changes in company [9].

Purpose of the article is to develop methodical recommendations for usage of value oriented management tools in process of construction projects preparation and forming of project portfolio. Sharing usage of the proposed approach and appropriate tools in construction will provide a proper formalization for processes of directing of top management efforts to the growth of capital appreciation (property) of developer-company as a participant of the construction and investment process.

2. Materials and methods.

Appearing of value-oriented management concept was related with necessity of forming a new company executives way of thinking in conditions of growing competition in commodity markets and dynamic development of stock markets in 1980s. The choice of value indicator as main strategic orienteer of company development has helped to approve all goals of company activities by concentration of efforts on key factors of value creation as well as determine the dependence between organization, strategy and enterprise value in the capital market [1]. With time, much more attention has been paid to the problem of value company management by Russian companies. It has been caused by several problems:

1. The specific of Russian management, first of all, based on the fact that Russian managers are concerned on issues of production and the correct direction of funds, rather than the market value of the enterprises they lead. This has led to low capitalization of Russian economics and «phenomenal by world standards fact: balance value of the enterprise significantly exceeds market value» [6].

2. Low investment attractiveness of Russian enterprises. The investment attractiveness is directly depend on the correct assessment of stocks value. So, there is a necessity of active practice spread of Russian enterprises value management aimed to capitalization increase.

Functioning of construction enterprises in conditions of crisis prolongation on the background of turbulent market environment, dynamism and globalization of markets stimulates them to search for resources of leveling negative influence of the environment. One of the modern approaches, which has got a wide spread among international management practice, is the value approach or deviation management [11].

If we consider a construction project as complex, then it can be schematically reflected as shown in the Figure 1.

**Figure 1.** Scheme of the life cycle of a construction project.

After signing the contract, during the implementation of construction project, cost of the construction may be changed due to circumstances not considered in previous calculations or force majeure. In this case, the construction estimate is corrected according to estimated normative documents with use of estimate program complexes, and so, the factual value of particular works and construction process as whole is determined.
The appropriate level of fiscal and value effectiveness of the construction project largely depends on organization of its implementation. It requires optimization of realization duration of individual stages and project as whole, coordination with available financial and material resources and conditions for their use [7].

Project management is the developed methodology, which includes models, methods and program resources that are widely used during development and implementation of projects of different scales and types [10].

3. Results.
Method of mastered volume can be used during the process of modelling on the stage of construction project execution analysis [5; 9; 11]. The relevant report for this method presents the process of project implementation. According to the data of such report, deviations in costs and terms can be revealed. In support of this, several schematic examples of project analysis at a certain point in time are given in [8].

Using the method of mastered volume, problem situations appearing during the implementation of construction projects can be formalized and further events can be predicted. There are some indicators, the content of which need to be understood to efficient use of the mastered volume report in management practice.

Consider 3 main indicators [7-10]:
• BCWS – Budgeted Cost of Work Scheduled;
• ACWP – Actual Cost of Work Performed;
• BCWP – Budgeted Cost of Work Performed.

Accordingly, it is possible to foresee options for possible deviations and determine their causes. The examples of deviations of the main cost indicators are presented in the table 1.

**Table 1. Possible causes of fiscal and cost deviations of construction project**

| No. | Ratio of indicators | Cost characteristic | Time characteristic | Possible causes of deviations |
|-----|---------------------|---------------------|---------------------|-----------------------------|
| 1   | BCWS=ACWP           | C \_\_fact=C plan   | T<T plan            | Use of new technologies or mechanisms. Reducing the duration of individual works. The need to redo individual works. Mistakes in planning of resource providing. Failure to fulfill contracts in time. |
|     | BCWS<BCWP           |                     |                     |                             |
|     | ACWP<BCWP           |                     |                     |                             |
| 2   | BCWS=ACWP           | C \_\_fact=C plan   | T>T plan            | Increase resource usage per unit time. Mistakes in time planning. |
|     | BCWS>BCWP           |                     |                     |                             |
|     | ACWP>BCWP           |                     |                     |                             |
| 3   | BCWS<ACWP           | C \_\_fact>C plan   | T<T plan            | Reducing the number of employees or mechanisms. Temporary stop of the project or individual works. Resource delays |
|     | BCWS<BCWP           |                     |                     |                             |
|     | ACWP=BCWP           |                     |                     |                             |
| 4   | BCWS>ACWP           | C \_\_fact<C plan   | T>T plan            | Replacing individual resources (materials, mechanisms, etc.) with cheaper ones. Delays in financing. Reducing the lead-time of individual works. Introduction of individual changes. |
|     | BCWS>BCWP           |                     |                     |                             |
|     | ACWP=BCWP           |                     |                     |                             |
| 5   | BCWS>ACWP           | C \_\_fact<C plan   | T>T plan            |                             |
|     | BCWS>BCWP           |                     |                     |                             |
|     | ACWP>BCWP           |                     |                     |                             |
| 6   | BCWS>ACWP           | C \_\_fact<C plan   | T<T plan            |                             |
|     | BCWS<BCWP           |                     |                     |                             |
|     | ACWP<BCWP           |                     |                     |                             |
|     | U_{ji}>r_{ji}       |                     |                     |                             |
Huge problem of the value-oriented management in Russia is the difficulty of use of developed foreign methodologies [13]. Often analytics do not carefully consider and use basic assumptions of these methodologies. At the same time, according to modern accounting rules, intangible assets (trademarks, licenses, company brand and its reputation, etc.) remain unaccounted or carried at cost that does not correspond to market situation. Market capitalization depends on assessments of these indicators’ value. This way, if an asset was acquired several years ago, it is possible that its initial value may not correspond to its actual market value; and managers can manipulate certain values, which are reflected in financial statements in order to increase estimated value of such assets.

Cost methodologies of efficiency assessment that have been spread in the territory of the former USSR and within modern systems of resource management (in particular, MRP, ERP, SAP systems) give an opportunity to adequately present and understand the previous experience of realization of business operations [14]. The methodologies of efficiency results assessment, which traditionally have been dominated abroad are getting much more spread in Russia explaining the future and based on assessment of expectations (market, owners, enterprises, competitors, investors, etc.).

During the process of a construction project, management of fiscal and cost deviations of the project where the most important part is the establishment of single information stream from project launching to its introduction into exploitation remains problematic [15]. As many scientists suppose, “management by exception” is one of the most perfect management systems, which based on key indicators of efficiency [16-18]. However, in our opinion, it is necessary to additional take into account the features of modern concepts of “Integrated Project Delivery” and “Building Information Modeling” which determine their specificity of use for operational activity of construction enterprises.

Balanced distribution between key participants and implementers of the project such as reward, responsibility and risks, is set with the system of organization’s contractual relationships named “customer-designer-contractor”. So, the complex system of planning and resource management of the enterprise must be closely related with variety of aspects, in particular: lineup of contracts in FIDIC construction, informational interaction, digital object models, competencies in area of project management, pricing in construction process, etc. Thus, according to specific activity of a construction enterprise, the process of optimal manufacturing program formation must begin with providing of its production capacity optimization [20].

Traditionally, during the realization of the project, such important facts as time, resources (productivity, capacity) and cost are considered isolated from each other whereas they are
interconnected. So the problem of integrated by time, cost and productivity planning has a fundamental significance for construction project realization. Based on the deviation management methodologies relatively new to Russian science, and practice of value oriented management, which based on planning and control, there is an opportunity to improve the management of construction project realization process that includes cost assessment, cost planning (budgeting) and control of the cost. Such improvement is important in terms of efficiency of construction production since in the existing methodology, cost assessment comes down to budgeting and its management to fixation of factual results and compare them with plan results.

4. Discussion.
As much specialists think, “stage-by-stage movement” of a company in direction to achieve the desired state (in the context of a strategic idea) by realization of projects has significant prospects [4, 5, 7, 9, 15]. At the same time, replacement of the current activity management of an enterprise to project activity, as we suppose, is totally wrongful. Thus, a clear structuring of management decisions area is necessary for companies that are not project oriented. It will help to determine borders of project and current activities and provide coordination of management instruments for rational allocation of resources and time within project portfolios and non-project activity.

Apologists of the project concept of development offer an introduction of the project office as the center of strategic development, which in conditions of matrix structure must provide the realization of related tasks [8, 11, 13, 14]. However, such format of project management may be appropriate only within project-oriented companies. In companies, which main activity implements in non-project principle, usage of such management system of development is almost impossible [15, 17, 18]. Traditional methods are primary oriented on neutralization of unpredicted costs related to physical objects (construction materials, constructions) whereas most of deviations are caused with human factor, imperfection of the organization, nature, changes, mistakes, delays, which are not assessed adequately in estimates. Because of this, works volume (especially by labor costs) are greatly underrated, so the deviations of value assessment and duration should be classified as optimistic or pessimistic [11].

Conclusion.
Modern business model of integrated of counter action to the fiscal-cost deviations of project within contract construction must rely on new set of procedures, analytical instruments and program products, which together must cover content of processes and works during the whole investment cycle – from initiation, concept development and business planning (including development of alternative investment options), to reaching rated capacity.

So, informational documentation of the project should be divided into 5 groups: schedule, resources, costs, cash flow and reporting. This methodological approach gives an opportunity further to subdivide limited resources into project works thereby determine the duration and cost of works implementation and construction project realization, and also build a flow chart. It significantly extends the range of economic levers and determine the selection of profit as an indicator of efficient activity of the enterprise. According to this, two-dimensional space “scope of work-time” or “scope of work -cost” becomes three-dimensional “scope of work -time-cost”.

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