

## CONTROLLING THE COSTS OF INDUSTRIAL ENTERPRISES INNOVATIVE PROCESSES

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The nature of controlling the innovative processes costs at industrial enterprises is revealed. It is shown how to improve the controlling of the innovative processes costs using budgeting. There is developed a scheme for correlating analytical and synthetic information while forming the price and making planned estimated calculations as a part of the design estimate documentation. The planned contract estimate and schemes of financing the innovation project are determined by using the normative method of calculating the estimated costs of the project.

**Key words:** costs of innovative processes, controlling, budgeting, estimate, information, sources of control.

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## КОНТРОЛЮВАННЯ ВИТРАТ НА ІННОВАЦІЙНІ ПРОЦЕСИ ПРОМИСЛОВОГО ПІДПРИЄМСТВА

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Розкрито суть контролювання витрат на інноваційні процеси промислових підприємств. Вдосконалено контролювання витрат на інноваційні процеси, використовуючи бюджетування. Розроблено схему взаємозв'язку аналітичної та синтетичної інформації під час формування ціни і складанні планового кошторисного розрахунку в складі проектно-кошторисної документації. Плановий контрактний кошторис та схеми фінансування інноваційного проекту визначають, використовуючи нормативний метод розрахунку кошторисної вартості проекту.

**Ключові слова:** витрати на інноваційні процеси, контролювання, бюджетування, кошторис, інформація, джерела контролю.

### **Problem statement**

One of the key factors of improving the management of industrial enterprises is a control and analysis system. Objective management information base is accounting and reporting data transformed in accordance with IFRS, challenges and segments of control and analysis. They provide the necessary information to achieve the goals of management in business activities. The investigation of existing monitoring systems indicates their limited use to detect and evaluate internal reserves for the development of innovative activity of industrial enterprises. It is an urgent problem to develop methodological and organizational principles of control and analysis system for managing innovation processes of industrial enterprises, which would become a means of forming relevant information for decision-making.

The current accounting system doesn't fully meet the increasing needs of management. Financial reporting information allows us to provide only a general assessment of the financial condition of the company and can not be used for proving management decisions on the costs of industrial enterprises'

innovative processes. In this regard, the importance of internal control as one of the functional components of management dataware, designed to achieve strategic and tactical goals rises and requires new approaches to its improvement. The urgency is reinforced by the fact that the existing methodological approaches do not consider the organizational and technological features of innovation processes. Organization of controlling the costs of innovation processes management includes many controversial and unresolved issues, such as: objects, methods and control tools specification depending on its objectives, directions and targets; improvement in documentary support and control of analytical procedures; forming methods of implementation results of control; development specific methodological decisions.

### **Analysis of recent research and publications**

The works of foreign and Ukrainian scientists (O. Borodkina, L. Hnilitska, A. Efremov, O. Kantayeva, V. Ozeran, A. Pustovit and others) highlight the issue of accounting and control costs of industrial enterprises' innovation processes. The article of Russian researcher A.V. Efremov [3] presents a management approach to the problem of classification costs of innovation processes. He distinguished the costs of technological preparation innovation (conducting R & D (research and development work), the acquisition of technical documentation), the costs of licensing, purchasing new equipment and materials, and production costs of development, use of new equipment, materials, components and semis. O. Borodkin [1] has proposed the reflection of the expenditures on preparation and development of new products by applying the estimated rates. This option involves previously making estimate, which provides enumeration of all costs associated with the preparation and development of the product. You can reach full repayment of the cost of preparation and development of the product after switching to the serial output if you periodically make adjustment in your estimate. L. Hnylytska expresses the same opinion [4, p. 48].

V. Ozeran [7] considered and proposed his own methodological approaches to budgeting costs of innovation processes as one of fundamental elements of controlling expenditures on enterprise' innovation processes.

However, the study and analysis of the published scientific papers suggest that the issues of controlling costs of innovation processes are still under consideration in both the scientific and practical aspects and in need of further improvement.

### **Objectives**

The purpose and objectives of the study are to develop recommendations for the improvement to controlling costs of industrial enterprise' innovation processes in order to effectively manage these costs.

### **Materials**

In modern conditions of industrial activities it is very important to improve organization of internal control in managing the costs of innovation processes. The organization of internal control is considered as a structure of control functions management, which establishes the subordination and responsibility to perform defined tasks on the costs of innovation processes.

Internal control conducts a complex study of the legality and appropriateness of business operations and assesses the actual state of the object to respond to rejecting the norms for achieving the objectives of cost management and decision-making. This approach to internal control indicates the target use of the results for decision-making.

The resources, processes and results are objects of internal control considering that the costs of industrial enterprises' innovative processes are used in all economic processes and production capacity. As the main directions of internal control we distinguish: classification of costs; organization of internal control material costs; organization of internal control over activities; organization and a system of implementation control results for decision-making. Therefore, the input data are the indicators that reflect enterprise' purchased available resources and assets which using is profitable. Background information of internal control combines evaluative information on the use of enterprise resources.

For effective monitoring costs of innovation processes it is necessary to define the purpose, objectives, sources, objects, subjects of control, test procedures and predict possible violations.

A chief engineer, department of internal controls (for large enterprises) or a separate official with control power (for small businesses), inventory commission are subjects of controlling costs of innovation

processes. Sources of controlling costs of innovation processes are: primary documents (payroll and depreciation data, invoices, transfer certificates, etc.), registers of synthetic and analytical accounting bills 39, 154, 12, General Ledger; reports.

The authors suppose that sources of controlling costs of innovation processes should be divided into documentary and informative ones. Primary documents on accounting costs of innovation processes refer to the documentary sources. Informative sources include planned information and valid legislation, such as: Chart of accounts assets, capital, liabilities and business operations of enterprises and organizations; Instructions on the use of the Chart of accounts assets, capital, liabilities and business operations of enterprises and organizations; Accounting Standards “Intangible assets” (П(С)БО 8); “Inventories” (П(С)БО 9); “Expenses” (П(С)БО 16); Law of Ukraine “On the innovation”; Law of Ukraine “On research and scientific and technical activities”; Law of Ukraine “On priority directions of innovative activities in Ukraine”; Law of Ukraine “On special regime for innovation of technology parks”; the Tax Code of Ukraine; the Standard Regulation for planning, accounting and costing of research and development works; the Order of the enterprise’s accounting policies, internal regulations and planning documents etc.

Implementing internal control all business transactions are checked concerning the following costs of innovation processes: material, wages, depreciation, payments to various contractors and others.

Reports of companies are the main source of information for analysis and cost control. However, taking into account the frequency of reporting for implementing internal analysis and control costs of innovation processes it is necessary to use analytical data of accounting system that allow you to analyze both current and any date necessary data.

An important form of control is to check adherence to deviation the project implementation. You can calculate many deviations, including:

- costs deviation;
- schedule deviation.

Deviation from the schedule indicates that project implementation is behind planned schedule. The received information can be used in predicting the total amount and the project completion date. Considering the deviations project manager can both predict operation timeline and putting efforts correct the general final budget costs.

Many projects are changed after the start of work that the final product may differ from the targeted one. Changes in size affect the quality, production schedule and costs. Projects are often divided by series of works, each of which has an individual schedule. Adherence to schedule is crucial. The correlation between quality and costs is often very important.

Another key aspect of control is the remains unfinished work. Future costs and time required to complete the project should not be unexpected for the guidance. Indirect costs depending on the size of the company, its organizational structure and needs of the economic analysis of costs can be controlled at the enterprise level or be shared by several cost accounting centers. The number of cost centers corresponds to the number of projects that the company fulfills during the reporting period. A separate accounting record (in paper or electronic form) which is being opened at the time of first costs for individual projects and closed at the time of the last project costs and has its own code is created for each cost accounting center. Projects are unique, inimitable; have a great degree of uncertainty; require a large number of highly qualified specialists and coordination of activities for a long time.

With increasing competition and customers’ requirements it is necessary to substantiate cost of goods (work or services) more clearly. While planning the estimated cost and signing the contract in work performance, we need to estimate how the difference between the price the customer is willing to pay and direct project costs cover indirect costs that the company plans to compensate by this contract. As a result we calculate a percentage from the production cost of direct costs within which it is planned reimbursement of indirect costs in the reporting period of project implementation. Therefore, firms choose to allocate additional articles on direct costs rather than indirect ones.

New and advanced control mechanisms, one of which is budgeting, should be used and introduced for proper organization cost accounting of innovation processes.

Internal budget management plays an important role in the process of budgeting costs of innovation processes. As R. Kostyrko notes“ .... internal budget management is a time-consuming job that requires a

clear definition of the object, purpose, methods of control and generalization of the results for decision-making” [6, p. 160–161]. In our view, the organization of internal budget management in costs of innovation processes involves the following sequence of stages: identification evidence, consideration of actual results from planning, synthesis and use of the results of control, development efforts to adjust budgets, and monitoring the adjusted budget costs.

The purpose of budgeting as a management technology depends on the manager’s objectives. In this case, you must select the types and formats of budgets, budgeting procedures and technology, budgetary targets and standards, consolidation and authorization. Many enterprises don’t have any cost budget of innovation processes that limits innovation process monitoring. For the next reasons budgeting costs of innovation processes are not performed:

- 1) technical difficulty and complexity of controlled operations;
- 2) in most cases lack of possibility to measure the economic effects or conditional nature of such measurement;
- 3) lack of management’s understanding of the significance of budgeting costs of innovation processes for the successful business operation in the future. The last of these reasons is in practice a crucial factor that determines the commercial success or failure of the innovation project [5].

We agree with V. Ozeran who considers that existing business budgeting system should be supplemented with extra budget costs of innovation processes as it will be a prerequisite for monitoring their effectiveness. Budgeting costs of innovation processes, as the budget of the enterprise, should become the basis for the strategy and medium-term planning, and promote sustainable development of the enterprise. The main purpose of the budget costs of innovation processes will be planning and controlling the enterprise’s financial soundness to spend money on capital and current matters, necessary to perform the innovation process [7].

In order to effectively manage the innovation project budget you must clearly recognize that the project budget is an investment (distributed over time and linked to the stages and sub-stages of the process for achieving the desired result) and a discrete set of interrelated activities limited in costs and resources (in the form of the estimate).

Estimate is a list of cost groups according to an individual project (or facility costing) that are considered as rational ones under the technical and economic conditions of the project. The cost of the project estimate is evaluated in the following order.

During the preliminary assessment phase the project concept is being adapted through expertise in the realm of technical and financial characteristics; according to their results the planned consolidated project estimate is calculated (the maximum level of expenditure on the project). Then the estimate goes through several stages during which there is its specification (from the planned consolidated estimate in the preliminary assessment phase to the final fixed value of the estimate that is known only after the design work in the completion phase of the project). Before starting work of the project management has decided to accept or decline the project.

Regulation of the budget formation and adoption provides the primary initiation costs on the average level of the organizational structure of management in the enterprises with extensive production and organizational structure.

Planned local project budget and cash flow diagram for each of the projects are the basic outgoing documents to form a consolidated budget funding for the whole enterprise.

Control and cost analysis is based on the actual costs deviation from the boundary planned estimates. This analysis is carried out by each work in the reporting period. Control and cost analysis has been consolidated since the beginning of the project implementation using earned value which provides the link between expenditure and intensity works for predicting the operation timeline and determining the final cost of the project.

Design and estimate documentation data, production and design division’s information and specifications in working structure of the project which display requirements (specifications), performed in accordance the technical requirements set of operations (technical specification for work and materials) are original information for planning costs of innovation processes. Taking into consideration the data and performance characteristics, human resources involved in the project are measured on the basis of output norms, workers’ piece-rates, the required operating time of professionals and tariff rates.

The following sequence of actions on the formation and adoption the innovation project budget is presented in fig. 1.

The innovation project budget allows to compare both the extent to which the planned total costs of a particular innovative project is reimbursed by the planned revenues, and budgeted amount of profit or loss for implementing projects. In the planning period it will harmonize the enterprise’s resource sources with their exploitation in order to get profits.

In evaluating the costs of a specific innovation project you should focus attention on determining the amount of pre-project costs and regulations to determine the recoverable amount of overheads considering working conditions in the planning period; technological and organizational conditions provided in the organizational project and project implementation; analysis results of the costs of completed projects.

According to the definition of planned information on the estimated cost of the project we designed a scheme of interrelation of analytic and synthetic data while forming prices and making planned cost estimate calculation as part of the design-budget documentation (see fig. 2).

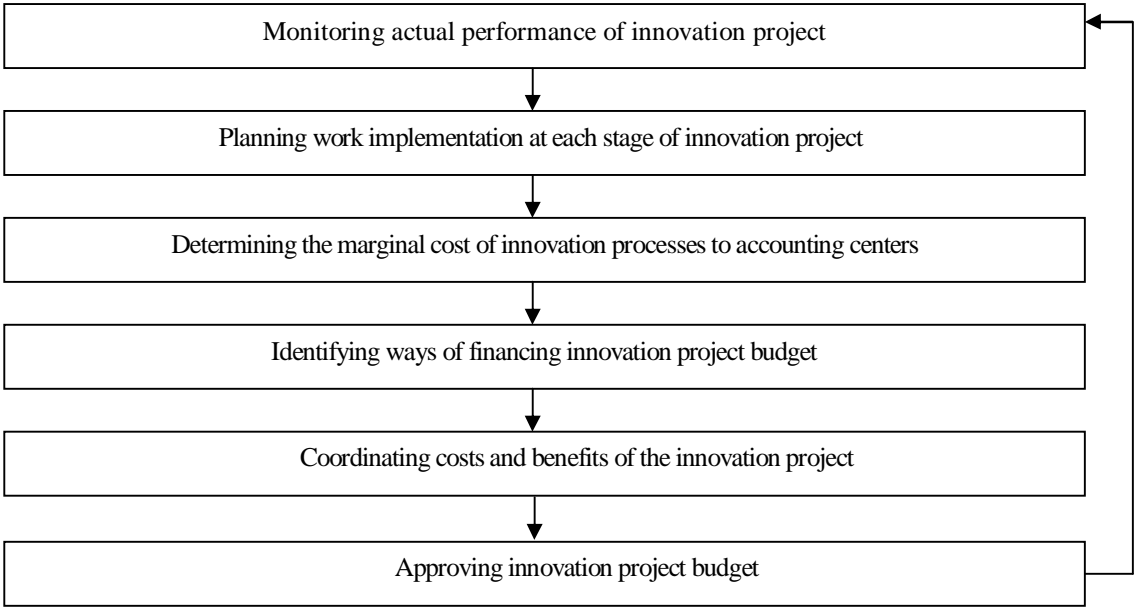


Fig. 1. Sequence of actions on the formation and adoption the innovation project budget

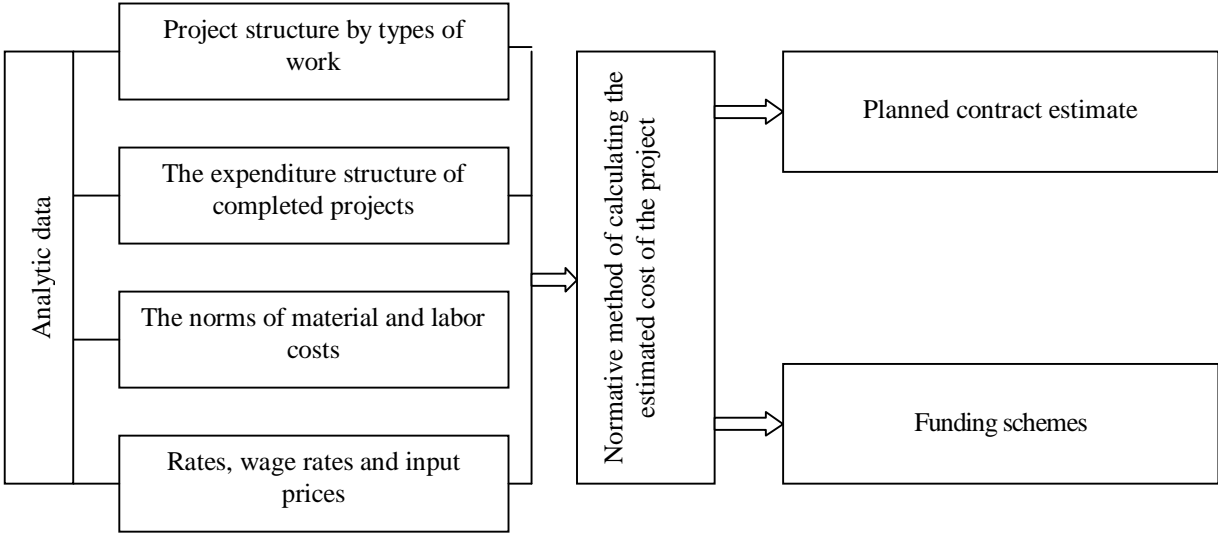


Fig.2. Interrelation of analytic and synthetic data while planning estimated cost of the project

Information on actual costs coming from the operational management costs of innovation processes is supplemented by information on indirect costs, which is accumulated in the appropriate registers within the economic direction of management and grouped according to the stages of the innovation process for their analysis.

### Conclusions

As a result we found that the current system of cost accounting for the innovation processes cannot be used to substantiate management decisions and control this area. Budgeting as a control mechanism is proposed for using and implementation. The current budgeting system of enterprises must be supplemented by a separate budget costs of innovation processes. It will be a prerequisite for monitoring their effectiveness. We determine that the project budget is an investment which is distributed over time and linked to the stages and sub-stages of the process for achieving the desired result. The project budget is also a discrete set of interrelated activities limited in costs and resources which is represented in the form of the estimate (a list of cost groups according to an individual project (or facility costing) that are considered as rational ones under the technical and economic conditions of the project).

The developed sequence of procedures for forming and adopting the budget of the innovative project will allow to compare both the extent to which the planned total costs of a particular innovative project is reimbursed by the planned revenues, and budgeted amount of profit or loss for implementing projects.

The authors have designed a scheme of interrelation of analytic and synthetic data while forming prices and making planned cost estimate calculation as part of the design-budget documentation. Using the statutory method for calculating the estimated cost of the project, you can make a planned contract estimate and identify funding schemes of the innovative project.

### Prospects for further research

There is still not fully resolved the issue of regulatory support for monitoring and analyzing the development and use of resources spent on innovation processes. At this stage it is important to develop methodological and organizational principles of analysis costs of innovation processes. Future plans are to review and propose improved approach to identify stocks while studying costs of enterprise's innovation processes.

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