

INTEGRATED MODEL OF MANAGEMENT ACCOUNTING OF INNOVATIVE COSTS

Nataliia Akimova
State Biotechnological University
(Kharkiv, Ukraine)

Tetiana Naumova
State Biotechnological University
(Kharkiv, Ukraine)

Abstract. It was determined that innovative activity is a key element of ensuring the successful and sustainable functioning of the enterprise. The definition of management accounting of innovation activity is given. Innovation costs are defined as the main object of management accounting of innovation activity. A logical model of management accounting of innovative costs based on the integration of modern concepts and methods (elements of the method) of management accounting of costs has been developed: Target Costing, Life Cycle Costing, Kaizen Costing, Activity Based Costing, etc., allowing to optimize the amount of direct and indirect innovation costs at all stages innovative activity taking into account external and internal factors; the origin and essence of these concepts are considered, their advantages and disadvantages are highlighted. The essence and features of target costing as a method of targeted strategic cost management to increase the competitiveness of the company's products on the market was considered, and the sequence of stages of its practical implementation during the implementation of innovative activities was developed.

Keywords: innovative activity, management accounting of innovation activity, costs, cost accounting methods, Life Cycle Costing, target costing.

The state of innovative activity is the most important indicator of the development of our society and its economy, and in the conditions of globalization, the innovative potential of the country becomes a decisive factor that determines its competitiveness. Innovative activity is a key to the competitiveness of both individual enterprises and the national economy as a whole¹

Modern European integration aspirations of Ukraine must be ensured by real socio-economic transformations, in which the innovation factor is irreplaceable. The beginning of the effective process of forming a single universal approach to the organization of the innovative economy for any country is the study of the existing experience in this field of the countries of the world, for Ukraine it is the experience of the EU countries².

¹ Акімова Н.С., Янчева Л.М. (2021) Організація обліку інноваційної діяльності: вітчизняні та міжнародні аспекти, с.18.

² Михайлишин Л. І. (2016) Зарубіжний досвід активізації інноваційної, с.99.

Recently, a new concept of “innovative accounting” has been increasingly encountered in the scientific literature. The authors determine the need for the formation and development of innovative accounting in the accounting system by the formation of the information needs of enterprise managers for innovation because in a competitive environment they are charged with analyzing the micro- and macroeconomic environment, studying technical, organizational, marketing innovations that exist on the market. At the same time, the authors do not give a definition of innovative accounting, but only note that at the stage of formation it can be considered as a specialized segment of management accounting and analysis in the accounting system of an enterprise.

In our opinion, the concept of innovative accounting can be interpreted in two senses:

1) the use of new, modern concepts and accounting methods (for example, elements of management accounting, international experience) to increase its effectiveness in terms of meeting the information needs of users;

2) a system for the formation and use of information about the objects of innovation activity.

The ambiguous understanding of this term can lead to confusion when using it. In this regard, leaning more towards the second interpretation of the concept of "innovation accounting", we consider it more appropriate to use the concept of "accounting for innovation activity".

Management accounting of innovation activity is, in our opinion, a system for the formation and use of information on innovation activity using accounts and (or) management reports for the purpose of planning, monitoring, and analyzing indicators of innovation activity in order to make informed operational and strategic management decisions at different levels of management organization, which ensures the achievement of its tactical and strategic development goals. The focus on achieving the goals of the company determines the target nature of the modern system of management accounting for innovation.

Important in the study of the system of management accounting of innovation, in our opinion, is the definition of its objects.

In our opinion, the objects of management accounting of innovation activity are directly dependent on the information needs of management for making effective management decisions. In this regard, as the main objects of management accounting of innovative activity, we single out the costs and results of this activity. Other objects of accounting, in our opinion, should be considered from the standpoint of their impact on the costs and results of innovative activities. The most important object of management accounting for innovation activity is costs since their effective management directly affects the result of innovation activity. At the same time, under the costs of innovation activity, we understand the costs in the form of expended assets or resources, valued in terms of value, incurred to achieve the goals of innovation activity.

Today, in the era of rapid development of information technologies, it is impossible to present an effective management system of an innovatively active

enterprise without the use of modern accounting tools for managing the costs of its innovative activities, which directly include management accounting and budgeting.

Today, there is a wide variety of cost management methods that can be used and adjusted by enterprises in relation to the specifics of their economic activity. A properly developed cost management system allows you to reduce production costs and predict the emergence of threats and risks to the organization, as well as it allows you to get more profit without changing the cost of sales. This is extremely important in the conditions of competitive struggle and in the implementation of venture and innovation projects in the conditions of the current market of innovative breakthroughs³.

In countries with a more developed market economy, entrepreneurs focus their attention on methods that, in addition to accounting and costing, include the aspect of management and provide more comprehensive information for analysis and improvement of cost management⁴.

Cost accounting methods are used to calculate the cost of production. The method of cost accounting is a set of ways of displaying, grouping and systematizing data about costs, which ensure the achievement of a defined goal, the solution of a specific task.

In foreign practice, world-known concepts of "direct costing", "target costing", "life cycle costing", "kaizen costing", "activity-based costing" and others are used, as well as methods of target cost accounting. However, this does not exclude the possibility of using operational management tools in the process of implementing innovative activities.

In the system of cost management for innovation, in our opinion, the most effective mechanism will be the use of an integrated model of management accounting for innovation costs based on ideas and individual elements of these concepts, which is shown in Figure 1.

LCC analysis (Life Cycle Costing), or the calculation of costs by stages of the product life cycle, is used in strategic management because it covers a period of several years. It is the only cost management method that considers the impact of inflation through cash flow discounting in decision making⁵.

It is advisable to use LCC analysis for enterprises that produce a range of non-standard products and are in a market niche that is unstable in terms of demand parameters.

The emergence of the concept of the product life cycle is associated with the name of Theodore Lewitt and his article, published in 1965 in the Harvard Business Review entitled "Exploit the Product Life Cycle".

³ Назаренко Т.П., Франчук І.Б., Вітер С.А. (2021). Методичні аспекти обліку та управління витратами на виробництво продукції, с.84.

⁴ Загарій В. К., Мельнік К. В. (2018). Особливості обліку та управління витратами на підприємствах: вітчизняний та зарубіжний досвід, с.159.

⁵ Лепетан І. Методи обліку витрат: вітчизняний та зарубіжний досвід.

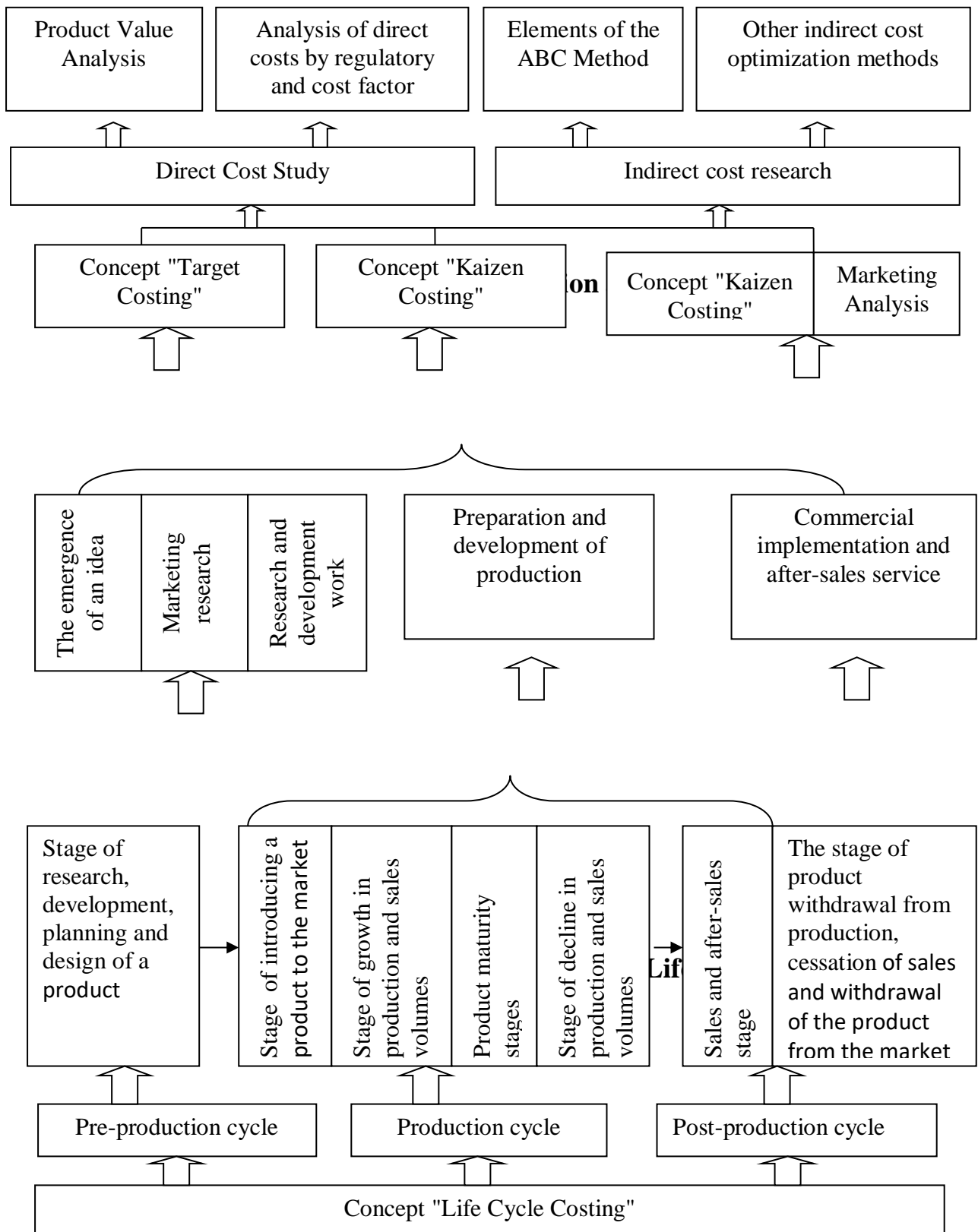


Fig. 1. The proposed integrated model of management accounting for innovation costs

The essence of this concept is that each new product introduced to the market at a certain moment goes through a certain life cycle, during which there is a change in the ratio between the volume of its sales and the amount of profit received. The attempt to use the product life cycle concept as a management accounting tool has given rise to a new concept of product life cycle costing ("product LCC").

The main idea of the concept of management cost accounting by stages of the product life cycle is that the calculation of the cost of a product is carried out by including all the costs associated with it throughout its life, from the moment of the first research and ending with the withdrawal of the product from the market. In other words, not only the costs of the production stage of the product life cycle, but also the pre-production and post-production costs associated with this product must be correlated with an individual product.

Thus, the possibility of accounting for innovation costs, singling them out as a separate object arises only within the framework of this concept, while traditional accounting systems do not make it possible to link these costs with specific products, but unreasonably treat them as overhead costs. This is the reason why our proposed innovation cost management model is based on the concept of managerial cost accounting by product life cycle stages (LCC).

Figure 1 shows that the innovative activity of the organization associated with the release of new products covers, to one degree or another, all product life cycles. We can safely say that the costs of the pre-production cycle are completely innovative and are distributed between such stages of innovative activity as the emergence of an idea, marketing research and research and development work. Statements regarding the qualification of individual production stages as stages of innovative activity are rather controversial. In our opinion, the processes of preparing and mastering the production of new products, which are an integral part of the production cycle (the stage of introducing the product to the market and, in part, the growth of sales volumes), can reasonably be considered as separate stages of innovation activity. As a result, there is a stage of commercial implementation and after-sales service of products released in the process of development, that is, in the first years of the implementation of an innovative project, which belongs to the after-sales cycle.

Although full life cycle costs can be associated with a particular product, they are different in their economic nature. So, the costs of the pre-production cycle are the costs of conducting various kinds of research, experimental, work aimed at developing a new product. At this stage, the ideas of the "target costing" concept are being increasingly used. The concept of "kaizen costing" is aimed at optimizing costs at the production stage and is complemented by marketing analysis methods at the post-production stage of the product life cycle. Identification of individual stages of innovation activity at each product life cycle requires a comprehensive application of these concepts in the innovation cost management system.

The concept of "target costing" (calculation of target costs, the Japanese name is genka kikaku) was developed in the 1960s in Japan. Its first practical application in 1965 is associated with the Toyota Corporation.

Japanese managers based the concept of "target costing" on a revolutionary and simple plan. The target cost will be determined by the difference between the expected market price and the company's expected profit. At the same time, managers and production personnel are working on matching product costs with the target cost price⁶.

The term "target costing" was coined by Toshiro Hiromoto in his 1988 Harvard Business Review article ("Another Hidden-Japanese Management Accounting"), which has since become one of the most cited articles on the achievements of Japanese management accounting. It should be noted that earlier the term "target costing" was not used in English-language business and professional publications.

Target costing is a cost accounting system based on a target price. This method provides for the calculation of the target cost of production based on the sales price previously established based on marketing research, excluding the profit that the company plans to receive. Having received such a value, the developers of new products work on the design of its production, having a specific task on its cost price. And in the process of production of such products, accounting should provide managers with information on compliance with the target cost level⁷.

There are various definitions of target costing in the literature. We define the target costing method as a set of techniques and methods for generating and summarizing information about target costs (at the design stage), the calculation of which is based on the functional features of the product that create its value from the consumer's point of view, a set of cost reduction (optimization) techniques used with the purpose of creating a system of strategic cost management, as well as a system for accounting and analyzing deviations of actual costs from target ones in the context of product components (at the production stage). This definition, in our opinion, quite fully reveals the essence of target costing, which is being transformed from the concept of strategic cost management into a specific method of strategic management accounting, based on its own principles and having its own tools. The essence of the method is to determine the target cost of a new (improved) product even before the start of its production, based on forecast data on sales volumes, the price of the product and the level of profit required by the owners.

The classical pricing model based on the "costs plus" principle considers the price as the sum of a "technologically" justified cost and markup (formula (1)):

$$\text{Price} = \text{Cost} + \text{Profit.} \quad (1)$$

This approach works well in companies that produce unique, unparalleled products, or products for special orders.

In the target pricing model, the resulting factor is the cost, the upper limit (maximum) of which is set as its possible market price minus the desired profitability (profit) of the product (formula (2)):

⁶ Tanaka T. (1993). «Target costing at Toyota», p.4-11.

⁷ Царук В. (2017). Вітчизняні та зарубіжні методи обліку витрат: порівняльна характеристика, с.53.

$$\text{Target cost} = \text{Target price} - \text{Target profit} \quad (2)$$

To determine the target cost of the product, the amount of profit that the company wants to receive is subtracted from the expected market price determined by the results of marketing research based on the desired sales volumes. In this case, the market price within the framework of this concept is called the target price (target price), the desired difference between the cost and the selling price is called the target profit (target profit), and the cost at which the product should be manufactured is called the target cost (target cost).

It is important to note that the concept of "target cost" differs from the concept of "planned (normative) cost" used in domestic practice. The difference is that the planned cost is calculated on the basis of the norms and standards that exist at a particular enterprise. The standards, in turn, are focused on existing production technologies and traditional characteristics of products. In accordance with this, the planned cost will be nothing more than the average (in some cases the best) values of the costs of previous periods and are completely tied to the internal abilities of engineering and production. The target cost is the value of the cost, the maximum allowable (acceptable) market conditions.

Target costing is an effective and necessary tool in the innovation cost management system, which has more advantages that can be used for enterprise purposes than disadvantages that can be avoided in various ways with effective management. However, the use of the target costing method in the innovation management system can only become an effective tool when it is used in combination with methods such as kaizen costing, modern methods of distributing indirect (overhead) costs (for example, ABC), functional cost analysis, etc.

Thus, having studied the main ideas, essential characteristics, and principles of the "target costing" concept, evaluating its advantages and disadvantages, we have developed a sequence of stages of its practical implementation while implementing innovative activities to create a new product, which is shown in Figure 2.

At the first stage of the "target costing" cost accounting system, an analysis of the market for new products is carried out to determine the expected (target) sales volume, which will become the basis for planning the scale of production, and to establish the target sales price. An important role is assigned to the employees of the marketing department, on which, ultimately, the result of all the work done at subsequent stages depends.

The next two stages relate to the establishment of the level of profit and profitability necessary for top management and owners and the calculation of the target cost of a new product. At the fourth and fifth stages, based on the current and (or) developed norms and standards, the standard cost of the product is calculated, after which, by comparing it with the target cost, the amount of costs to be reduced (sequestered) is determined.

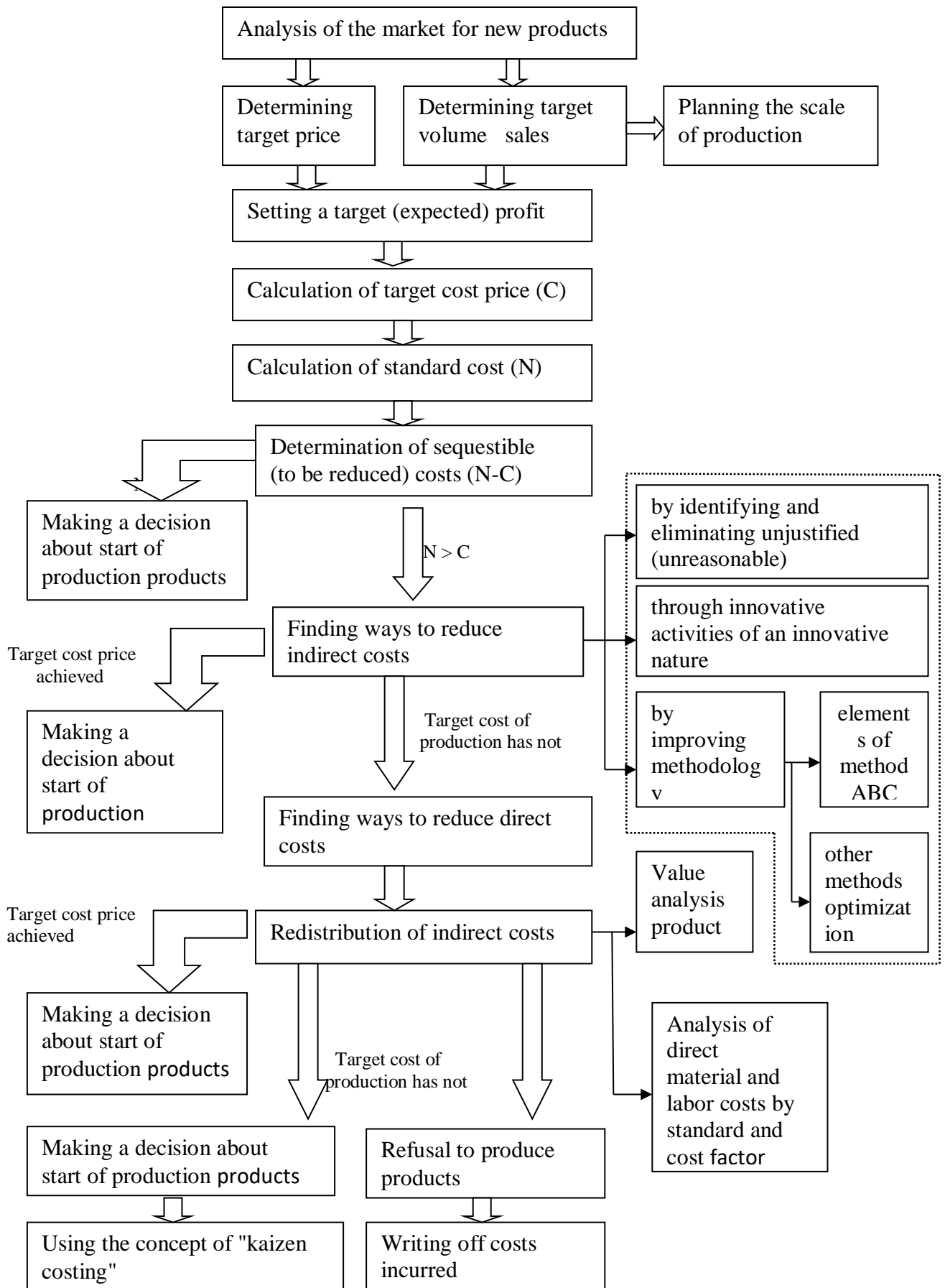


Fig. 2. Block diagram of the sequence of stages of the accounting system target-costing

Source: author's development

If at the fifth stage it turns out that the standard cost has been established at the target level or turned out to be less than it, which is quite rare in practice, then a decision is made to start production of a new product. The most common option is the situation when the standard cost exceeds the target, which is a prerequisite for the occurrence of sequesterable costs.

Considering cost reduction options within the framework of the target costing method, many specialists begin to look for reserves to reduce direct, as a rule, material costs by studying the functionality and properties of the product. In our opinion, first of all, it is necessary to investigate indirect costs, since, firstly, it is often in these items that reserves for reducing costs are hidden, and secondly, the traditional methods of distribution of indirect costs used at the enterprise do not allow one to reliably determine their amount attributable to individual types of products.

In market conditions of management, it became obvious that the most manageable from the standpoint of finding reserves of savings, profit growth and profitability at the enterprise that determined the production and marketing program, are gradually becoming not the main, but overhead costs. Overhead costs in most industries are constantly increasing both in absolute terms and relative to the total cost of an economic entity. In this regard, the sixth stage in our flowchart is the study of indirect costs in order to find ways to reduce them.

So, reducing indirect costs for new products can be due to:

- study of the total amount of indirect costs in order to eliminate unjustified (unreasonable) costs;
- search for opportunities to reduce indirect costs through innovative measures;
- study of the methodology used at the enterprise for the distribution of indirect costs in order to more accurately calculate the cost of new products;
- complex use of the above options.

At the next stage of the analysis, it is necessary to assess the possibilities for implementing innovative measures that will reduce indirect costs. These include, for example, the use of energy-saving technologies, automated control systems, non-waste production, improvement of machinery and equipment, the use of new technologies, etc. These activities may require certain investments, so their effectiveness needs to be assessed. At the same time, if successful, they are a real source of reducing indirect costs.

The study of the method of distribution of indirect costs is the final stage of their comprehensive study.

A lot of works of domestic and foreign authors are devoted to the study of the cost management system in the context of activities, including the ABC functional cost accounting method and the ABB activity-based cost budgeting method. At present, there is no doubt that it is the use of the ABC (Activity Based Costing)

method or the functional cost accounting method that makes it possible to calculate the cost of production and manage costs most accurately.

The main principle of the method is that products use activities rather than resources. These used resources, as well as their acquisition and use, are called costs. First, they are allocated to activities, and then, based on demand, they are redistributed to products. And the indicators used in this case are cost carriers, which include resource carriers and activity carriers, that is, the organization is examined here as a set of work operations (processes) that determine its specificity⁸.

The ABC method, or cost accounting by type of activity, assumes that the enterprise's activity is considered as a set of processes or work operations, and the amount of costs for the corresponding period or to produce a certain type of product is determined by adding all the incurred costs for each process and business operation.

The ABC method is currently considered one of the most promising methods of cost management. The disadvantages of this method are its complexity and time-consuming nature. The ABC method can be used most effectively at those enterprises where the specific weight of indirect overhead costs is high.

In our opinion, the integration of the ABC method into the target costing system will make it possible to manage the amount of sequestered costs more effectively through more accurate calculation of the cost of production, which is the main goal of the ABC method.

The essence of the ABC method is the grouping of overheads by activities, which are absorbed by specific products through the selected system of cost carriers. It should be noted that many different bases for the distribution of overhead costs, which were actively used in the theory and practice of traditional domestic accounting systems, can be useful as cost carriers.

The ABC method is not universal due to differences in the types of cost carriers at different enterprises, because of which its implementation and application at a particular enterprise requires quite laborious work to study the characteristics of the organization, its structure, production process and other parameters. In addition, it is not always necessary to use this method in its traditional sense with respect to the entire enterprise, which allows us to talk about the possibility of applying the elements of the ABC system in practice in combination with other methods of overhead distribution.

Thus, based on the results of the analysis of indirect costs and the search for ways to reduce them, it is necessary to determine whether the target cost level has been reached or whether further research is required. If the amount of the identified reserve for reducing indirect costs is greater than the amount of sequestered costs,

⁸ Зав'ялова Е.С. (2014). Облік витрат за центрами відповідальності, с.174-177.

then a decision is made to start the production of new products, otherwise direct costs, which consist of material and labor costs, are studied.

There are various options for reducing direct costs. We have identified 2 main approaches to this issue: analysis of direct material and labor costs by the normative and cost factor and analysis of the value of the product.

Reducing direct costs due to the regulatory factor involves a detailed study of the norms and standards used in calculating the standard cost of a new product, assessing their validity, compliance with advanced technologies used in the industry, as well as the possibility of improving production technology to reduce the consumption of material resources and the labor intensity of performed works.

The cost factor is preferable to apply in relation to direct material costs, since it involves the reduction of direct costs due to the cost of resources. At the same time, a decrease in wages for workers can lead not so much to cost savings as to negative consequences due to a decrease in product quality, an increase in staff turnover, and failures in the production process, because of which the enterprise may suffer losses many times greater than the savings received.

At the end of this stage, it is necessary to summarize the results of all stages aimed at reducing standard costs and identify the total amount of the identified reserve. The undoubted success of the work done is the achievement of the target cost of production, which indicates the possibility of introducing a new product into production. Otherwise, the value of the adjusted standard cost and target is subject to analysis. If the deviation is recognized as acceptable, then the product also begins to be produced, in the process of development, work is actively continuing to find ways to reduce its cost, which forms the basis of the "kaizen-costing" concept. At the same time, methods like those discussed above are used, and our own experience in the production of new products is also considered.

Thus, after considering the above methods of cost management at enterprises, we can state that all systems differ in implementation costs, reliability, focus on a certain type of costs, etc., and each of them has several advantages and disadvantages. Enterprises that use foreign methods of cost management direct their activities to find ways to reduce costs, introduce innovations in production, ensure greater accuracy of accounting and costing⁹.

The considered calculation methods are extremely progressive. However, the problem is that in the conditions of an unstable economic environment, most of the information about production costs, which is reflected in the accounting of domestic enterprises, is not used for their effective management, because there are no

⁹ Загарій В. К., Мельнік К. В. (2018). Особливості обліку та управління витратами на підприємствах: вітчизняний та зарубіжний досвід, с.157-163.

incentives to reduce the cost of production. That is why modern methods of cost accounting and product costing are not implemented in domestic practice¹⁰.

A study of the practical application of cost accounting methods shows that in practice it is extremely rare that each of the named methods and approaches is implemented in its pure form. The various goals pursued by enterprises and the peculiarities of their economic activity led to the emergence of many combinations of basic cost accounting methods within the framework of one classification form¹¹.

References:

1. Акімова Н.С., Янчева Л.М. (2021). Організація обліку інноваційної діяльності: вітчизняні та міжнародні аспекти. Економічна стратегія і перспективи розвитку сфери торгівлі та послуг: зб. наук. пр. Харків : ХДУХТ, Вип. 2 (36), 18-34. URL: <http://elib.hduht.edu.ua/bitstream/123456789/6678/1/2.pdf>
2. Зав'ялова Е.С. (2014). Облік витрат за центрами відповідальності. Проблеми сучасної економіки. № 18, 174-177.
3. Загарій В. К., Мельнік К. В. (2018). Особливості обліку та управління витратами на підприємствах: вітчизняний та зарубіжний досвід. ДонДУУ. Менеджер. № 2 (79), 157-163. URL: <https://is.gd/niqzKV>.
4. Корольова О. І. (2015). Облік витрат виробництва: проблеми та перспективи. Економіка та управління на транспорті. Вип. 1, 79-90. URL: <http://publications.ntu.edu.ua/eut/2015-01/079-090.pdf>
5. Лепетан І. (2014). Методи обліку витрат: вітчизняний та зарубіжний досвід. URL: <https://is.gd/Mc2Q9d>.
6. Михайлишин Л. І. (2016). Зарубіжний досвід активізації інноваційної діяльності. Науковий вісник Ужгородського національного університету. Вип. 6, ч. 2, 99-104. URL: <https://bit.ly/3IHJDnj>
7. Назаренко Т.П., Франчук І.Б., Вітер С.А. (2021). Методичні аспекти обліку та управління витратами на виробництво продукції. Економіка та держава. № 7, 83-89. URL: <http://www.economy.in.ua/?op=1&z=4981&i=13>
8. Царук В. (2017). Вітчизняні та зарубіжні методи обліку витрат: порівняльна характеристика. Міжнародний науковий журнал. Вип.1-2, 49-53. URL: <https://is.gd/LrDiDv>.
9. Tanaka T. (1993). «Target costing at Toyota», Journal of Cost Management. Vol. 7, No. 1, Spring, 4-11. URL: <https://is.gd/g3qEi2>.

¹⁰ Корольова О.І. (2015). Облік витрат виробництва: проблеми та перспективи розвитку.

¹¹ Царук В. (2017). Вітчизняні та зарубіжні методи обліку витрат: порівняльна характеристика, с.53.