

Normative Method of Strategic Cost Management in the Supply Chain at the Stage of Product Development

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Abstract— This paper is devoted to the research and application of normative method of management on target costs in supply chain management. The normative method is a widespread method among foreign companies, but Russian enterprises apply this method not often because of its possible using difficulties. Two aspects of using this method are presented and problems of standards determination are revealed in this study, i.e. at the stage of development product and the stage of it output in supply chain process. Besides that, the existence of conception by management on target costs are discovered and the concrete procedures for application of target norms are presented. The authors lay great stress on control system of enterprise, so for this purpose the algorithm of normative control forming on responsibility centers are developed and presented by scheme. The results of this study allow to increase the competitiveness and the efficiency of enterprise's activity through cost management in the supply chain process.

Keywords— *standard cost, normative method, supply chain management, costs management, calculation*

1. Introduction

One of the important functions that manufacturing companies deal with in the field of supply chain management and decisions related to it, has a significant impact on their competitiveness, is "supply chain order management". But in this direction, managers face issues such as a) choosing the best combination of orders received in the supply chain and b) determining the exact cost of an order. The quality of norms can be measured by how these norms reflect trends in future development. Thus, P. Friedman notes: "Standard norms should indicate the way to the future, not reflect the past" [1].

In order to fully and reasonably detect deviations, firstly, it is necessary to analyze the standard cost of product. Its purpose is scientific justification of costs value from the point of view of increasing

profitability and increasing competitiveness of products. From this point of view, it is necessary to consider the possible change in purchase prices for materials, semi-finished products compared to the previous period, the advantages of new investments in equipment, to assess the material consumption of products from the point of view of monitoring the efficiency of materials use, to carry out costs analysis and criteria for assessing the competitiveness of products by quality, price, cost, etc.

The effectiveness of the method increases with the expansion of rationing and the consideration of costs at all stages of the product life cycle and activities. The use of the normative method should not be limited to production activities only, and other stages of the product life cycle should be considered. Moreover, the implementation and use of the normative method should not be limited to accounting. It should be applied to other management functions - planning, regulation, that is, to make the whole management process normative. In the terms of market relations, the relevance of research and the application of the normative management method increases. The principle of management by exception should cover all stages of the production process, including the pre-production stage of product development [2]. This study was conducted to design an appropriate model of organizational transformation strategy in supply chain cost management of Russian companies. The present study has studied the known models, transformation and identification of effective components in creating change in cost management and with the approach of organizational behavior, the factors affecting cost management, namely behavioral, structural, competitors and technology in the research community.

2. Research Method

Purchasing and supply management are looked to by most organizations as a significant contributor to the organization's cost management approach, as cost of purchased goods and services makes up 50 percent or more of the cost of sales of most manufacturers today. At the stage of product preparation, the normative approach to cost management can be found in two mutually related aspects. First, in justifying the cost of a new product (normative cost planning). Secondly, in accounting and controlling the costs of creating and mastering new products. The essence of the first aspect is to development of the norms' system, standards and extreme parameters of a product in which bounds normal economic activity will proceed, focusing developers and producers on future competition, but not on last experience. As we have already noted, the existence of science-based norms and regulations is an essential condition for the application of the normative method. However, the practice shows that standards are developed on the basis of the existing level of production and past experience of the company, and its level does not always meet modern requirements of product competitiveness [3].

In our opinion, the system of target rationing and cost planning through the supply chain process should be based on a market-oriented conception of target cost management, which should be applied starting from the product development phase. The concept of target cost management was based on:

- 1) orientation to the market of consumer product properties (formation of consumption and preference functions) and also quality, price, outputs and development of market prototype;
- 2) joining of desirable consumer properties with the product components realizing these functions: the link between the product functions and the services provided by the enterprise for the product can also be established;
- 3) calculation by method oriented on the competition, "return" accounting of the admissible costs providing achievement of target norm of profit per product unit;
- 4) comparison of the calculated admissible costs to factual or predicted costs and calculation of target costs for a product in general, its details and related services;
- 5) reorientation of product concepts planning and product research and development to achievement

of desirable target costs on the basis of the functional and cost analysis results (abbreviated FCA) and analysis of overhead costs;

- 6) the forming of the calculated target costs as a new norm or standard.

Target cost management is most appropriate in large-scale and mass production, but this does not exclude its application in single and small-scale production. The main approach to target cost management would be:

- 1) strengthening of market orientation, particularly orientation to consumers, competitors and suppliers with cost planning of a new product and its use;
 - 2) determination of quantitative economic criteria for product developers focused on consumers requirements, competition and expenses decrease in the processes of product development (cost engineering);
 - 3) timely control implementation of own production, suppliers and developers at all production stages for achievement of a new products set parameters;
 - 4) achievement of close interaction between development and preparation of production (synchronous engineering) in connection with planning of production capacities and its loading [4];
 - 5) carrying out the analysis of all processes connected with development, production, realization and utilization of a product and its influence on the enterprise's value indicators.
- The fundamental difference of planning in this cost management concept is not only to determine how much a product will be worth, but how much it should be worth. Consequently, it is necessary to rely on market requirements for products in determining of normative costs. Within the framework of this system, the main product parameters are specified taking into account the requests of potential consumers. Based on the estimated market price and the planned rate of return, target costs are calculated as the difference between price and profit. Target product costs should be detailed for each enterprise division, i.e. from product developers to manufacturing shops and sites, including sales and distribution departments. This situation implies close cooperation of all enterprise's departments, starting from the phase of product development. Heads of departments should ensure optimal tools and set costs for planned output. Therefore, costs

accounting according to target norms allows to optimize the production process organization [5].

The content of cost management based on target norms in the new products manufacture predetermines several necessary procedures:

1) market analysis (capacity and trends of market development, nature of competition, requirements to parameters of goods, etc.);

2) forecasting of possible prices and sales volumes taking into account the actions of competitors;

3) determination of profit rate for this type of products, calculated on the basis of the desired value of sales or in case of capital growth;

4) finding permissible or marginal values of costs according to the method "price minus profit rate" in terms of market conditions (technical and technological possibilities of production existing at the enterprise in this case are not calculated);

5) calculation of planned costs for product unit manufacture depending on existing technologies and specifics of production in the enterprise (projected costs); The value of projected costs generally exceeds the value of the limit costs calculated in terms of market needs, and the difference between projected and limit costs would be a reduction reserve;

6) definition of target cost norms set by the management of organizational subdivisions and mandatory for execution. Ideally, the target costs should be the same as the marginal costs, otherwise such costs based on the following inequality:

$$\text{Limit costs} \leq \text{Target costs} \leq \text{Projected costs} \quad (1)$$

The objective is to achieve a reduction in the cost rate, first to the target cost and then to the limit cost. In order to implement this task, the enterprise needs to develop and carry out a set of measures for rationalization and cost reduction, affecting both the product itself and the conditions of its production. After the cost reduction the target costs for products should be the same as the limit cost. Otherwise, the cost reduction cycle should continue. The target costs can be calculated both in aggregate, i.e. at full cost, and at direct costs. In the first case, it is necessary to assess the nature and correlation of cost reductions for direct and overhead costs. In the second case, for covering overhead costs, the rate of return (the normative share of covering fixed costs) needs to be increased. The types of costs excluded from calculations need to be controlled separately;

7) division of total target costs by product value. Various services related to the product market

offering are also taken into account. For example, support service, payment terms, warranty, delivery and installation, etc. The costs and effect are compared for each component of a product. Based on a comparison of product costs and benefits, a focused cost-benefit analysis is carried out. If spending exceeded the effect than cost-recovery or effect-enhancement measures are developed [6];

8) determination of standard costs for each product component, which allows to integrate cost management on the basis of target norms in the system, efficient accounting by establishing planned costs for each stage of production;

9) carrying out preliminary cost control at each stage. As part of this monitoring, all activities affecting production costs are pre-evaluated in terms of compliance with the target norms. This requires an analysis of the factors that influence the cost, in particular data on the change in production costs depending on the use of different types of materials, equipment and methods of production. The results of such analysis have particular importance in dividing target costs into product components [7];

10) the process of current management and cost control should not be stopped at subsequent stages. During the current management, the normative and actual indicators for individual departments of the enterprise are compared, the distribution of costs for different stages of the product life cycle is estimated to identify the reserve of cost reduction and control the effectiveness of measures to rationalize production.

3. Results

The suggested approach for dedicating resources to supplier cost management may seem cost prohibitive. However, the organizations studied unanimously agree that they receive extremely high returns on their investments in supplier cost management efforts. The money spent on supplier should-cost analysis, supplier development, and other tools and approaches pays for itself many times over in terms of reducing costs and bottom-line prices paid to suppliers. For The main problems of target-based cost accounting are the high level of uncertainty due to the long planning time. The period from product development to market may be several years. The methods and the received results used in calculation of target costs are followed by risk of a considerable error. However, this is not a specific disadvantage of this

system. Such difficulties and disadvantages arise in the use of any strategic planning tools. The elimination of problems associated with the calculation of pre-production cost rates should continue in the production process on the basis of accounting and analysis of changes in norms.

Another relatively independent direction of the normative method is cost management during the processes of production by normative and planned calculations per unit of product. In the area of planning and accounting, it is expediently to present the normative costs works and services, as well as cost estimates (budgets) by cost and responsibility centers [8].

Standard costing based on cost rates can be used for various purposes. Such calculations are used to

determine the actual cost of finished commodity, make estimates, monitor the rationality of resource consumption, estimate rejects and goods in processes. According to the standard-plan calculations, control is carried out over the cost rates reduction for shops, production, individual products, items of expenses. Besides that, comparative analysis of the similar products cost from different enterprises is carried out and activities that were not in line with the plan are identified. Also, such calculations are needed for monitoring the cost generation of the responsibility centers and to assess the efficiency of managers' activity. The control system for cost centers based on standard costs is shown by Figure 1.

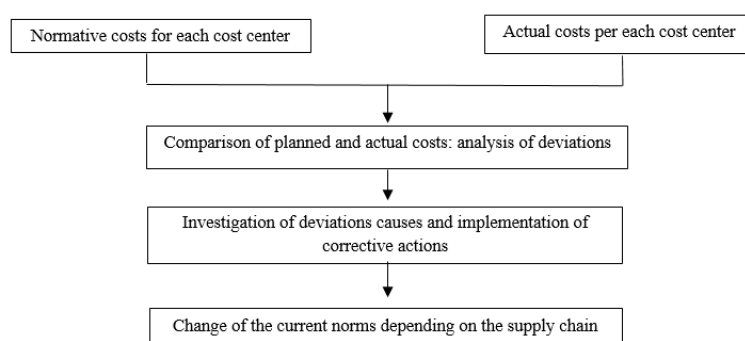


Figure 1. Formation of normative control by responsibility centers

Standard costing is based on the relevant cost items. For all productions it is obligatory to ration the direct costs, such as raw materials, materials, semi-finished products, the salary etc. Production overhead costs may be included in standard product costing based on standard rates, or may not be included, depending on whether the accounting and costing procedure is applied at full or reduced (direct) cost. Current trends of cost accounting development show that the standard cost estimates per unit of product or per unit of product component are based mainly on direct cost rates and variable overhead costs, and indirect fixed cost is accounted and monitored only by cost centers [9]. Overhead fixed costs should be planned and controlled by responsibility centers using estimated way.

4. Conclusion

The aim of this research was to clarify the characteristics of supply chain interaction, both in terms of different levels of interaction and concerning the factors affecting the appropriate level of interaction in cost management. A basic

prerequisite to enable companies to select an appropriate level of interaction within their supply chain is also to clarify the present use of terminology. In the production process it is necessary to adjust technical documentation, as the production process and the development of working operations are being improved, which requires constant revision of previously established standards. Researches carried out in individual organizations have shown that changes in standards are not always considered and tasks for cost reduction are not planned. This means that the economic impact of organizational and technical arrangements was not reflected in the production process. In our view, changes in the technical level should be reflected in a step-by-step adjustment of the estimated costs. At the same time, it is necessary to point out the reasons for this adjustment, that is, to highlight the changes that have arisen as a result of the organizational and technical measures implementation and for other reasons [10].

In order to plan the reduction of production cost and to analyze the factors affecting the production

cost in supply chain process, it is necessary to develop a nomenclature of the causes that caused the changes in the norms. The list of reasons should be developed individually for each organization, depending on the specifics of its activities and for management purposes.

The application of the normative method in the cost management system meets to modern trends in economic development and significantly increases competition and efficiency of companies.

Acknowledgement

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University

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