

Selection of the Optimal Product Program of Industrial Enterprise in Controlling System

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Abstract: The research describes the selection of the optimal model of the product program of the enterprise based on the strategic areas of management in the current controlling. Provided that the control functions are coordinated and focused on the achievement of strategic and operational objectives, taking into account the variability of the external and internal environment. Then, the control system will enable the company to gain competitive advantage and monitor targets for most early detection of problems and eliminate them. Presented in the article model allows us to plan the production process on the basis of the resource potential of enterprises and needs market product groups.

Key words: Current controlling, aggregate planning, optimal product program, the market, the external environment, internal environment, strategic areas of management

INTRODUCTION

The main task of controlling the company is to make recommendations for management decisions. To achieve it, the concept of decision-making from the perspective of controlling, taking into account the possible errors that can occur when making decisions and should be avoided. There are four approaches to ensure the development and management decision-making (Davis and Putnam, 1960) classical (rational) approach-to provide the most complete and accurate quantitative data for indicators and find the optimum; the principle of bounded rationality-identifying needs, setting goals, forming a set of alternatives and the selection of options that will provide the best results; effective management by Peterson-the optimization problem is not intended, the main task of controlling on this approach-a preliminary control and monitoring; socio-psychological approach-based on the conscious human influence and use in the management of human relations.

Thus, the managerial decision making process involves the selection logic of the theory which is capable of the most fully describe the process in a particular situation at a particular enterprise. Select Model management decision-making can be constructed by the following principles: analysis of the external environment of the enterprise-provides information on the economic and demographic situation in the environment, about the natural, scientific, technical, cultural and legal factors; analysis of the internal environment of the company an opportunity to assess their own capabilities to date: the

time horizon, the complexity, costs, risks, alternatives; identification of the goal. Tailored to the various situations influence the impact of each factor, it is possible to form an approach to decision-making.

MATERIALS AND METHODS

Problem formulation: Consider the enterprise as a system of elements between which the movement of logistical flows. Movement of such flows, in turn is accompanied by information flows which together with the sources and consumers of information constitute the enterprise information system. Management information indirectly reflects the processes within the enterprise and beyond. As a control element performs analytical data processing, as well as methods and tools to facilitate a better understanding of the events. In this case, on the basis of the information received form management decisions that affect the change in status of the internal working environment of the enterprise. This information helps to create a model for future relations with the enterprise environment, prevent risks and maximize the opportunities to achieve specific goals. At the same time to form a view allow you to analyze the current status of the company and its future, based on the development of scenarios and simulation data, focusing on the product program of the enterprise which is based on a "product" as the main vehicle for the company's success.

The product program of the enterprise is a model for future relations with the external environment of the enterprise which will take precautionary measures to

prevent threats and use situational opportunities. Formation necessary measures includes assessing the gap between the future and the present state of the enterprise. In this organizational information should enable an assessment of the current state of the enterprise to identify steps to reduce the gap.

Development of the product program of the enterprise requires consideration of additional data: the maximum possible and the minimum sales volumes in all markets and each market by types of products and distribution channels; the necessary funds and disposable time for each production process and the type of equipment (power); the maximum and the minimum required volume of supply (stocks) by type of material; norms of consumption of resources by type of product, etc.

Thus, all this will, to some extent, reflect the orientation of the company to the market and consumers, link to resources, deadlines and implementing complex manufacturing, research and development activities to ensure the achievement of the objectives of the enterprise. "The formation of the product program should be initiated by a senior management level and based on a comprehensive study of the positions of the enterprise in the environment" (Massart *et al.*, 2008; Gluhov, 2008; Nekrasova *et al.*, 2015; Suloeva and Mukhanova, 2013).

In developing the product program are generally used quantitative methods to optimize the product program of the enterprise within those areas and activities that are selected during the development of strategic decisions. The main task of optimizing the product program of the enterprise is to find a rational combination of prices and production volumes, taking into account of scarce resources. This process takes a central place in the system of production management, because it is directly dependent on the final results of the company.

Generally accepted criterion of optimality in the formation of the product program of the company is the maximum profit from the sale of products. The process of determining the optimal prices and sales volumes is reflected, above all, a change in the weight of individual products in the total production. The criterion for changes in specific gravity of individual products is the indicator of profitability of production. It is assumed that the increase in total sales over the share of high-margin products and provides the greatest amount of the relevant profits. To analyze the consistency of the above criteria need to build on each type of product analyzed the function of supply and demand of relevant costs which in turn is determined by the function of the relevant profit and/or function of product profitability.

RESULTS AND DISCUSSION

Problem-solving: Consider the algorithm for determining the optimal product program. The algorithm for generating the product program (Fig. 1), begins with the definition of general objectives which are formed at the highest management level and should take into account the claims of different stakeholder groups: the owners or shareholders, staff and customers (Massart *et al.*, 2008; Kazantsev *et al.*, 2013).

The results of the current medium-term planning are nomenclatural programs on the basis of which then developed plans for functional areas of activity in the first place, marketing plans, production, supply and plans for centers of responsibility. As a criterion for selecting the optimal product program are encouraged to use the relevant figure arrived. To date, in many sources (Massart *et al.*, 2008; Gluhov, 2008; Mukhanova, 2013; Shigaev, 2008; Grads *et al.*, 2008; Gluhov, 2003) is proposed to form an optimal product program on the basis of maximization of profit margin. However, our analysis shows that the product program options vary not only variable but fixed costs (additional advertising associated with the release of new products, additional costs associated with the preparation of production, etc). Thus, the objective function of the problem should be based on profit maximization relevant, ensures the implementation of alternatives product program.

Related income is an additional profit of the company resulting from the implementation of this embodiment, the administrative decision. The concept of relevant income is the difference between the relevant revenues and relevant costs. Relevant income and expenses are considered only those future revenues and costs which vary as a result of the decisions taken. Methods for the isolation of relevant income, costs and profits depend on the specifics of the company and of the specific task.

Thus, the objective function is the maximum value of the relevant profits in limited market capacity and resources of the enterprise. Of particular importance for the current and strategic decision-making in relation to the product program are indicators characterizing the size of the market such as the proportion of turnover and number of products that are in the respective phases of the market cycle introduction, growth, saturation and decline in total sales and product mix enterprise. These indicators cover a share of production, located in each phase of the life cycle which indicates whether there is at the disposal of the company sufficient number of new products to ensure continuous development.

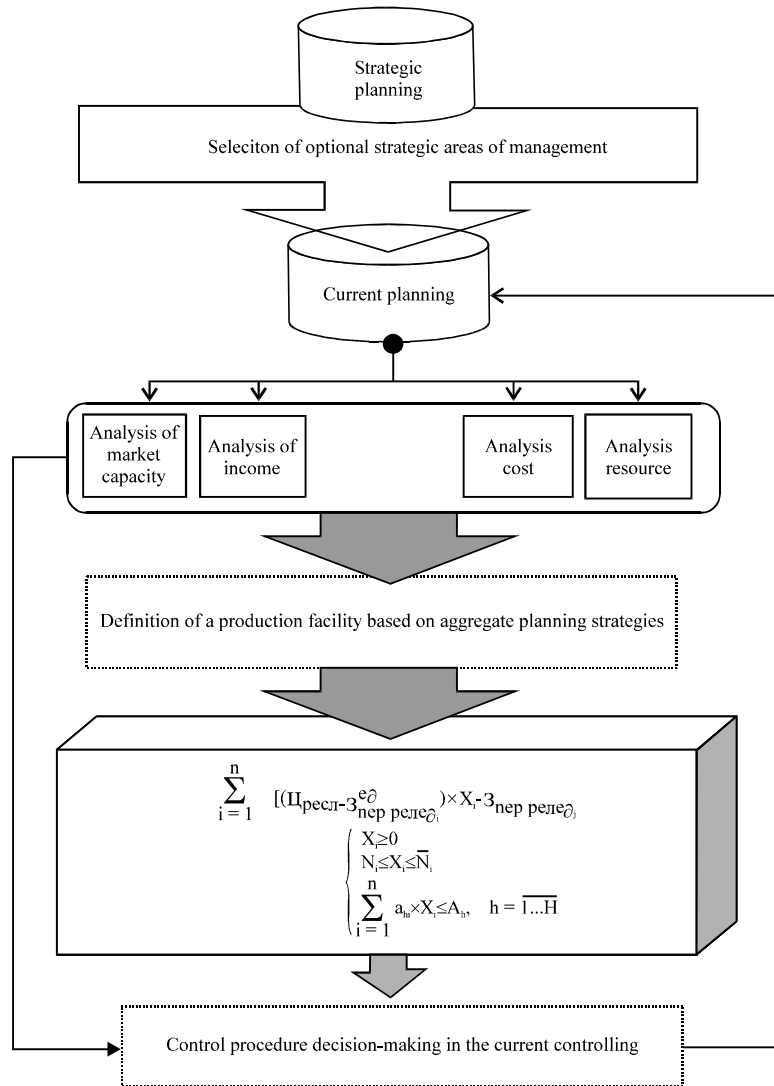


Fig. 1: Selection of the optimal product program of the enterprise

Of great importance is the definition of market share by product in monetary or physical dimensions. For this it is necessary to compare the position of the company to the position of the largest enterprise competitor, then it is possible to determine the relative market share by product and customer segments. On the basis of these two indicators marketing service should draw conclusions about the company's position in the relevant market.

Decision-making at the current grocery planning is determined by the requirement of a planning period in the minimum volume of sales and the maximum possible. Minimum required volume may be due to the requirement to perform already concluded long-term contracts for which the company is obliged to deliver a certain amount of product with preset conditions or the need for the company to maintain its presence with a certain minimum

offer products on the markets that are attractive in the long term. It should also take into account existing stocks of finished goods in warehouses of the enterprise.

This, in conducting market research marketing service is to identify upper and lower bounds of demand for the company's products during the planning period. To determine the optimal product program is necessary to properly evaluate the available resources of the enterprise and to set standards of their spending. In this case, it should be noted that to increase the efficiency of the production process at its planning can have two sub-goals: maximizing capacity utilization within the existing capacity and to minimize the average lead time. These resources are required for the performance of the product program of the enterprise, determine the production capacity of the plant.

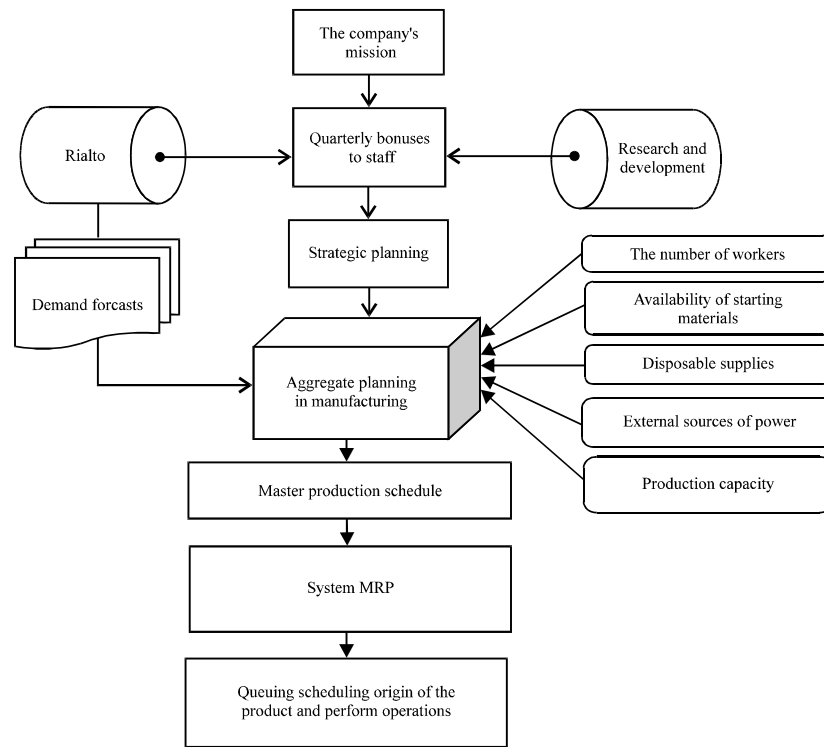


Fig. 2: The relationship of the aggregate plan

Under the production capacity of the company to understand the market conditions, the company's ability to produce in volume to meet demand in the medium term from three to eighteen months with minimal costs. At the same time as resources can be used: stocks; overtime; workers basic skills needed to implement the plan; temporarily hired workers; subcontract; advertising; special methods of product promotion, etc. Today discusses eight core resources, the use of which is proposed as an aggregate planning strategies. These include: change in inventories (groundwork). (Production backlogs in certain periods, based on the future demand); variation of the number of workers (employment and dismissal) in accordance with demand; variation of the rate of production (use of overtime or downtime); subcontracting; the use of temporary workers; variation of demand through advertising, pricing and other methods of promotion of the finished product; latency applications during periods of high demand; a mixture of season products and service.

Each strategy used separately is called a "pure" strategy and its use can lead to cost-saving aggregation plan. But the combination of them (called a special strategy) often gives the best result. Special strategies using a combination of variables which allows to obtain the corresponding reality production plan.

For example, a firm may use as its strategy following combination: overtime, subcontracting and inventory management. It is obvious that there are many combinations of different strategies, the analysis of which is crucial for managers of professional tasks. The term "aggregation", applied to the aggregate plan, means the union (enlargement) of the respective positions of the nomenclature in general, bringing together all the individual titles. The procedure and requirements for consolidation is not the subject of our research, so they are not considered in the research (Kazantsev *et al.*, 2013; Richard, 2001; Zagorodnikov, 2008; Hepelev, 2005).

Physical planning is part of a much larger system of planning, so understanding the interface (connection) among several internal and external factors will serve a greater understanding of the whole problem (Fig. 2). The main thing we would like to note is that as a result of a finding of an aggregate plan we get a list of volumes and the resources that we then use to find the best product software company. In other words, we get a list of volumes and resources $A_h(h = 1, H)$, the values of which we use in the algorithm for finding the optimal product software company. This program can be viewed as a stage of disaggregation of the aggregate plan. complete disaggregation finally finds its expression in the main production plan (Fig. 2).

Following the logic of the order of execution of planned procedures in the first place for the implementation of the time is always an aggregate plan (the aggregate planning process). Then, on the basis of the found resources A_h ($h = 1, H$), selects the optimal product program of the enterprise and then compose the main production plan, the appearance of which means that the procedure is finished and disaggregation in the hands of the manager, a first tentative schedule of production of goods which is regarded as “rough” and clarification of which is accompanied finding the minimum of the relevant costs.

We deviate from the logic of the order of execution of planning procedures, following the logic of presentation of the monograph because the basis of presentation is derived from information obtained from finding the optimal solution of the product program of the enterprise that further consideration and offers.

CONCLUSION

Formation of the company's product program, begins with the definition of general objectives which are formed at the highest management level and should take into account the claims of different stakeholder groups: owners, shareholders, staff and customers. In this case, estimated at the disposal of the enterprise resources and norms of their spending. Based on the available resources necessary to carry out the product program of the enterprise, taking into account the aggregate planning strategies, determine the production capacity of the plant. As a criterion for selecting the optimal product program are encouraged to use the relevant figure arrived. Thus, the developed model will allow the product program to plan the production process on the basis of the resource potential of the company and the market demand for specific product groups.

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