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METHODOLOGY FOR DEVELOPING A PRODUCTION PROGRAM FOR THE INTRODUCTION OF A NEW PRODUCT IN INDUSTRIAL ENTERPRISES

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Abstract: Production activity is considered the main and primary function of industrial enterprises. Its importance is determined by the fact that if the enterprise does not produce a quality product within the required time and does not offer it in the right place, it will not develop and exist. The purpose of this report is to develop a methodology for developing a production program for introducing a new product into the production nomenclature of industrial enterprises. Such a methodology undoubtedly has a practical and applied nature and would be useful for managers who deal with production process management and daily solve operational tasks such as what, how much and how to produce with the available technological capacities and always limited material, financial and labor resources. To achieve the goal, this report uses various methods and approaches to discover and derive functional relationships in the interaction between individual units and teams carrying out production activities in industrial enterprises. With the help of the system analysis, the structural organization and the relationship between the production units and sections that will develop and implement the new product in the production program of the industrial enterprise have been made. In his work on this report, the author highlights the following main limitations: (1) the proposed methodology for developing a production program for implementing a new product has a specific application in industrial enterprises and (2) due to the short volume of this report, the methodology cannot be described in full and in detail, therefore its structure and content are presented in a practically applied schematic form.

Keywords: industrial enterprise, production process, production program.

INTRODUCTION

Industrial enterprises are created with a specific mission and a specific focus of production activity. It combines a variety of functions and tasks, distributed in time and space, which are technologically, logically and materially interconnected in such a way that at the end of this

process a finished product is produced. Through the produced product or service, carried out by the production activity and function, industrial enterprises realize their mission.

The purpose of this paper is to develop a methodology for developing a production program for introducing a new product into the production nomenclature of industrial enterprises. Such a methodology undoubtedly has a practical and applied nature and would be useful for managers who deal with the management of production processes and daily solve operational tasks such as what, how much and how to produce with the available technological capacities and always limited material, financial and labor resources.

MATERIALS AND METHODS

To achieve the goal, in this paper are used various methods and approaches to discover and derive functional relationships in the interaction between individual units and teams carrying out production activities in industrial enterprises. With the help of system analysis, the structural organization and the relationship between the production units and sections that will develop and implement the new product in the production program of the industrial enterprise were made.

During his work on developing the methodology, the author highlighted the following main limitations:

1. Since business activities have a wide scope and spectrum, the Author has limited his choice to the development of a methodology for developing a production program for implementing a new product in industrial enterprises.

2. Due to the short volume of this report, the methodology cannot be described in full and in detail, therefore its structure and content are presented in a practically applied schematic form.

The development of the annual production program and the preparation of the analyses mentioned above in the topic are the subject of this paper and will be explained in detail in the proposed methodology for developing a production program for industrial enterprises.

RESULTS

Production activity is considered the main and primary function of industrial enterprises. Its importance is determined by the fact that if the enterprise does not produce a quality product in the required time and does not offer it in the right place, it will not develop and exist. Production process is dependent on all other factors and functions carried out in industrial business organizations. If the markets for the sale of the produced products are not developed, they should not be produced. The expansion of production is possible after the tangible fixed assets are built and secured, through which this will be done.

In the opposite direction, the relationship between production process and the other functions in the activity of the industrial business organization is equally strong and dependent. Because if the products planned in terms of quantity, variety, quality and efficiency are not produced, marketing will not be able to make sales, and financiers will not receive the expected income.

The complex of activities that the production function encompasses is quite diverse and closely and directly related to the production result – the product or service. It includes the traditional production of the currently produced and implemented product or service, as well as all new products or services that will start production activity during the planned year.

This requires the development of special programs for the introduction of new products or services into production, as well as for their imposition on old and new markets. It is possible to separate the new production into separate production units or even into independent production units.

In order to ensure the necessary efficiency of production, it is necessary to make some analyses that will bring out and show what improvements need to be carried out in the coming year. This implies making an analysis of the life cycle of each manufactured product, as well as a

general life cycle of the manufactured production. The efficiency that will be achieved is the factor on which it depends. the adoption of one of the various possible alternatives.

The development of the nomenclature of the types of production produced is part of the documentation required in the planning activities of the organization. For each product or service, a separate (private) material balance is drawn up, where the following mandatory items are clarified:

- what quantity will be demanded during the year.
- how much of it is in the warehouses as a transitional balance.
- how much will have to be produced.
- how much will be sold and through what channels.
- what quantity will have to remain in the warehouses at the end of the year as a transitional balance for the next year.

For this purpose, Author will try to offer a methodology that will systematize the steps and summarize the necessary activities that will logically and consistently link the technological work, the correct, accurate and timely implementation of which will guarantee the production of a sought-after, high-quality and affordable product/goods.

The methodology for developing the production program in industrial enterprises is an important part of production management. It includes a system of steps and analyses that ensure balanced, economically efficient and resource-secured production.

The development of a production program in a machine-building enterprise is a complex and strategically important process that aims at the optimal use of resources and maximum satisfaction of market demand. The methodology for compiling such a program includes several stages and steps that can be formalized as follows:

I. Structure and content of a methodology for developing a production program in a machinery engineering enterprise

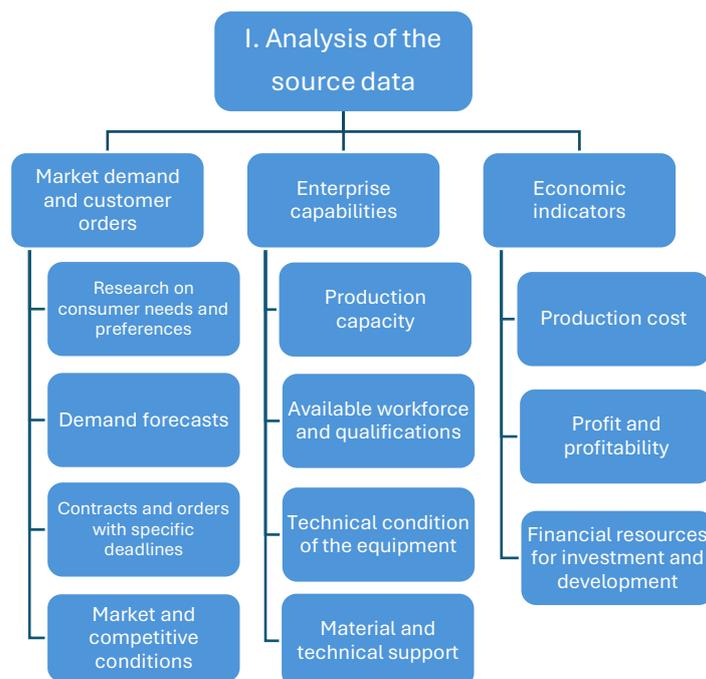


Figure 1. Analysis of the original data.

Source: The author

I. Analysis of the source data (Fig. 1).

1. Market demand and customer orders:

- Research on consumer needs and preferences
- Demand forecasts, sales forecast by products and markets
- Contracts and orders with specific terms
- Market conditions and competitive conditions.

2. Enterprise capabilities:

- Production capacity, coordination of production capacity with expected demand
- Available workforce and qualifications
- Technical condition of equipment
- Material and technical support.

3. Economic indicators:

- Production cost
- Profit and profitability
- Financial resources for investment and development.

II. Determining the production program (The basis of the production program is formulated by items) (Fig. 2)

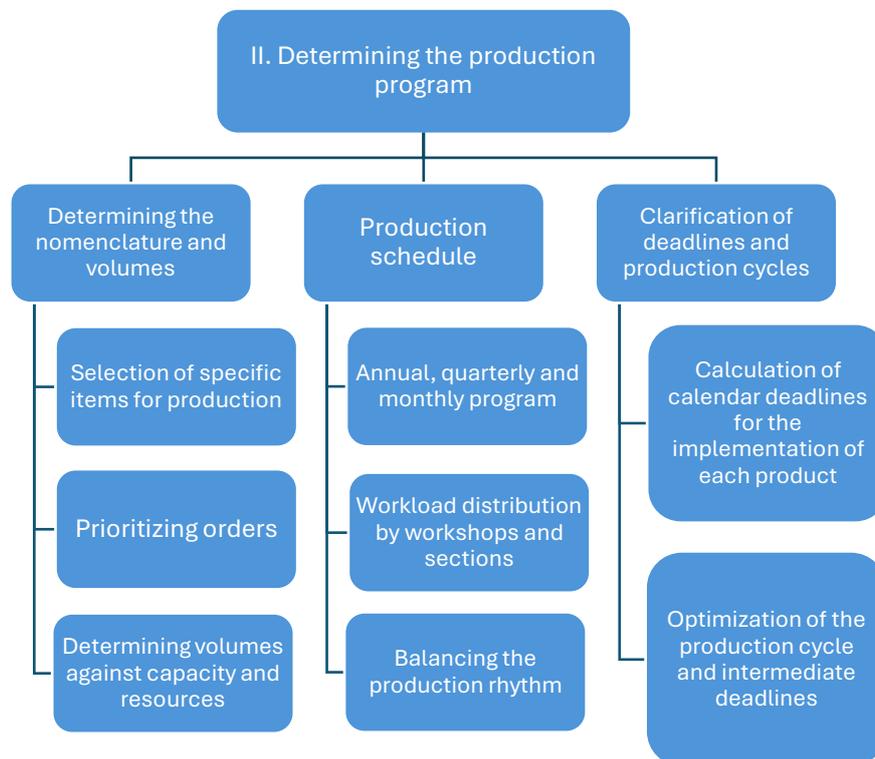


Figure 2. Determining the production program.

Source: The author

1. Determining the nomenclature and volumes

- Selecting specific products for production
- Prioritizing orders
- Determining volumes based on capacity and resources

2. Production schedule

- Annual, quarterly and monthly program
- Distribution of workload by workshops and sections

- Balancing the production rhythm
3. Specifying deadlines and production cycles
- Calculating the calendar deadlines for the execution of each product
 - Optimization of the production cycle and intermediate deadlines

III. Technological and resource provision. Analysis of production capacities (Fig. 3).

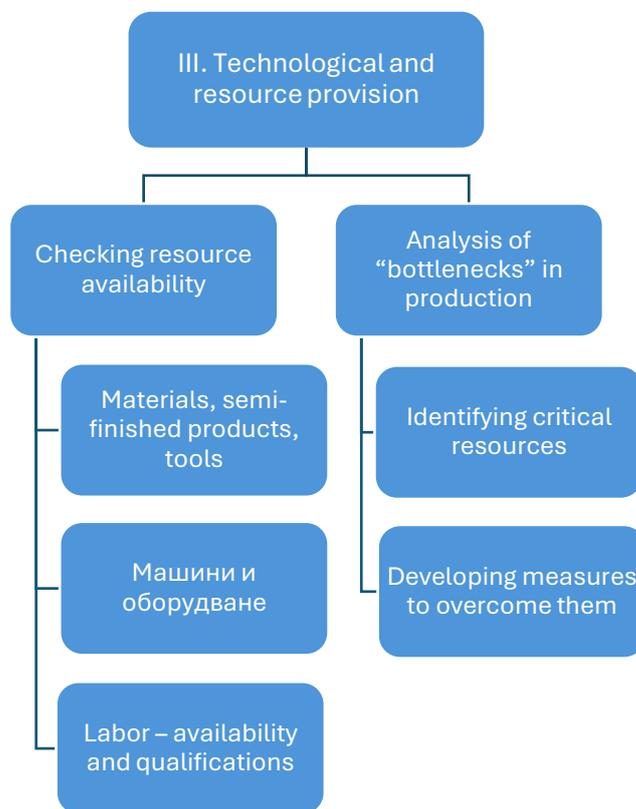


Figure 3. Technological and resource provision.

Source: The author

1. Checking the resource availability, checking the technical possibility of production: machines, equipment, technologies.

- Materials, semi-finished products, tools, and energy
- Machines and equipment, technical and resource provision
- Labor - available personnel and qualifications. Assessment of labor resources.

2. Analysis of "bottlenecks" in production:

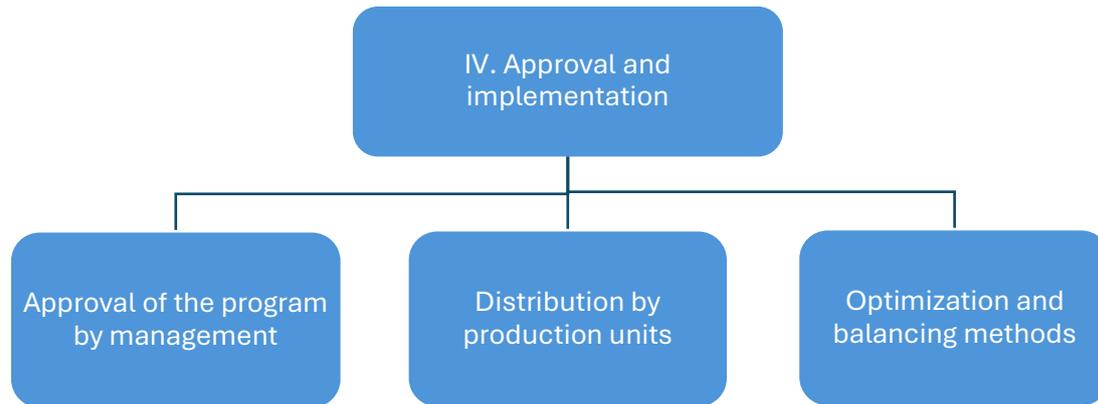
- Identification of critical resources
- Development of measures to overcome them.

IV. Approval and implementation. Optimization and coordination Creation of a production activity schedule (production calendar) (Fig. 4).

1. Approval of the program by management.

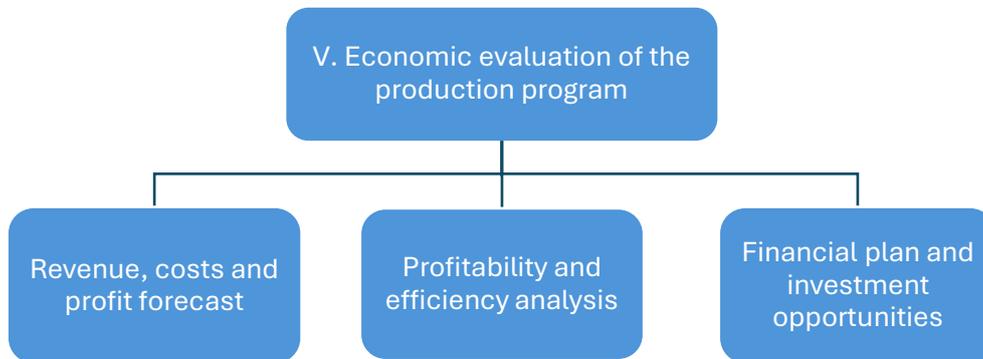
2. Distribution by production units and periods, decomposition of operational and current tasks. Annual program → quarterly → monthly → weekly. Breakdown by production workshops, sections, lines. Accounting for seasonality, workload and technological features.

3. Applying optimization methods. Balancing capacity, costs and volumes. Introducing buffers and reserves in case of uncertainty.



*Figure 4. Approval and implementation.
Source: The author*

- V. Economic evaluation of the production program. Financial analysis (Fig. 5).
1. Forecast of revenues, expenses and profits. Calculation of production cost.
 2. Analysis of profitability by product. Calculation of profitability and efficiency of the program.
 3. Financial plan and investment opportunities.



*Figure 5. Economic evaluation of the production program.
Source: The author*

- VI. Control, update and flexibility (Fig. 6).
1. Control and monitoring
 - Introduction of a current control system.
 - Analysis of performance by key indicators (KPI).
 - Monitoring of performance
 2. Update and adaptation
 - Regular update (for new orders, lack of resources, etc.)
 - Adjustments to changes in the market or production process.
 3. Flexibility
 - Possibility of entering urgent orders.

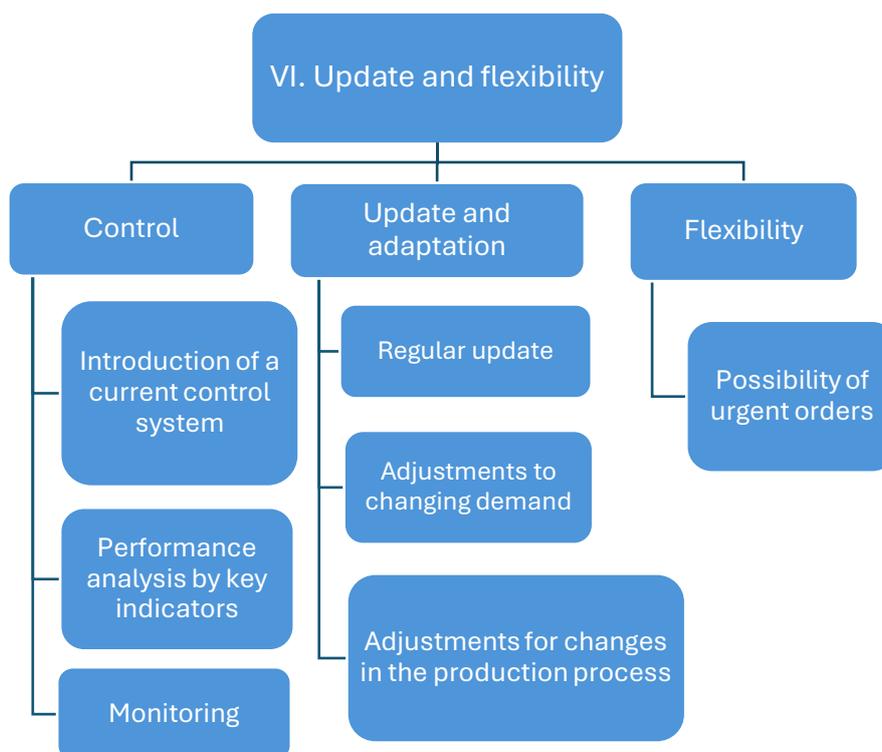


Figure 6. Control, update and flexibility.
Source: The author

Both for the preparation and in the process of developing and substantiating the production program, tables are included, which for greater clarity and analyticity contain and matrix-link various indicators. In addition, tables are developed that arise from the methodology and procedure of statistical reporting, which is required of industrial enterprises in the country. It is often necessary to fill in specific tables necessary for collecting information for special statistical studies. For some of the statistical studies, which are of a regular nature, it is also necessary to develop planned indicators, as is the case with the balance of inter-industry relations.

CONCLUSIONS AND RECOMMENDATIONS

The new strategies that the organization regularly develop may require significant structural restructuring, capacity reduction or expansion, new equipment, change of technologies, etc. This activity and, accordingly, function are closely related to the production process, but also to the investment and innovation activities and policies of the organization. Therefore, all decisions in this area are made in coordination with the managers responsible for the relevant activities, and with the participation of the chief executive officer. Changes in production capacities and fixed assets, changes in their total capacity, the choice of a site for their construction, the change of technology, etc. are actions that, in addition to being very expensive, have relatively long-term consequences for the development of the organization.

Depending on the chosen strategic alternative, the industrial enterprise includes in its annual plan and production program one or another task for the creation and preparation of the implementation of new products. The tasks for the implementation itself in both cases are the same or similar in content and scope, since the implementation in the production of its own and others new products requires almost the same efforts.

When the industrial enterprise has chosen to include in its production activities new products that it has designed itself, it will have to draw up a comprehensive plan for its research and development activities. This will be a plan for the activities of an independent research and

development unit. This plan will have to foresee and implement the part of the company strategy relevant to this period of time within a year.

LITERATURE

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