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# Evaluation of the production process and the company strategic position

## Ocena procesu produkcyjnego oraz pozycji strategicznej wybranego przedsiębiorstwa

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### Summary

The production process is the entire range of processes and deliberately undertaken actions, which are crucial for businesses. Dynamically changing environment requirements force companies to increase continuity of production, strategic position, innovation and competitiveness. The article presents an assessment of the manufacturing process and the strategic position of the enterprise. It also introduces proposals to optimize the production process and development opportunities for the organization.

### Streszczenie

Proces produkcyjny to całokształt zjawisk i celowo podejmowanych działań, który ma kluczowe znaczenie dla przedsiębiorstw. Dynamicznie zmieniające się wymagania otoczenia, wymuszają na przedsiębiorstwach zwiększanie utrzymania ciągłości produkcyjnej, pozycji strategicznej, innowacyjności i konkurencyjności. Artykuł przedstawia ocenę procesu produkcyjnego oraz pozycji strategicznej badanego przedsiębiorstwa, z uwzględnieniem propozycji optymalizacji procesu produkcji i możliwości rozwojowych organizacji.

**Keywords:** the production process, the company, the strategic position, production logistics, management.

**Słowa kluczowe:** proces produkcyjny, przedsiębiorstwo, pozycja strategiczna, logistyka produkcji, zarządzanie

## Introduction

Business operation in a rapidly changing environment, characterized by intense competition, continuous change in customer demand and rapid development of information technology requires constant business activities improvement (Pałucha, 2008) The enterprise production activity is dependent on both the internal and the external conditions of operation. Customer demand for the products continue to grow and individualize themselves. As a result of the dynamic changes in the market situation in the modern production management we have to deal with more and more complicated problems (Wyrwicka, 2009). The production process is of

crucial importance for the company. Equipment failure can cause downtime of the production line and thus a slowdown of the contract execution (Rut, Miłaszewicz, 2014). Moreover, the production process is a very complex process which consists of entire range of processes and orderly set actions (operations, activities), the aim of which is to make certain products. As a result the consumer receives products (goods or services), (Samuelson, 2009). Organization methods and control of production must be adapted to the current, complex and turbulent environment. Therefore, the basic criterion of company functioning efficiency and its development becomes now the speed and flexibility in responding to environmental signals, which significantly affect production processes (Brzeziński 2002).

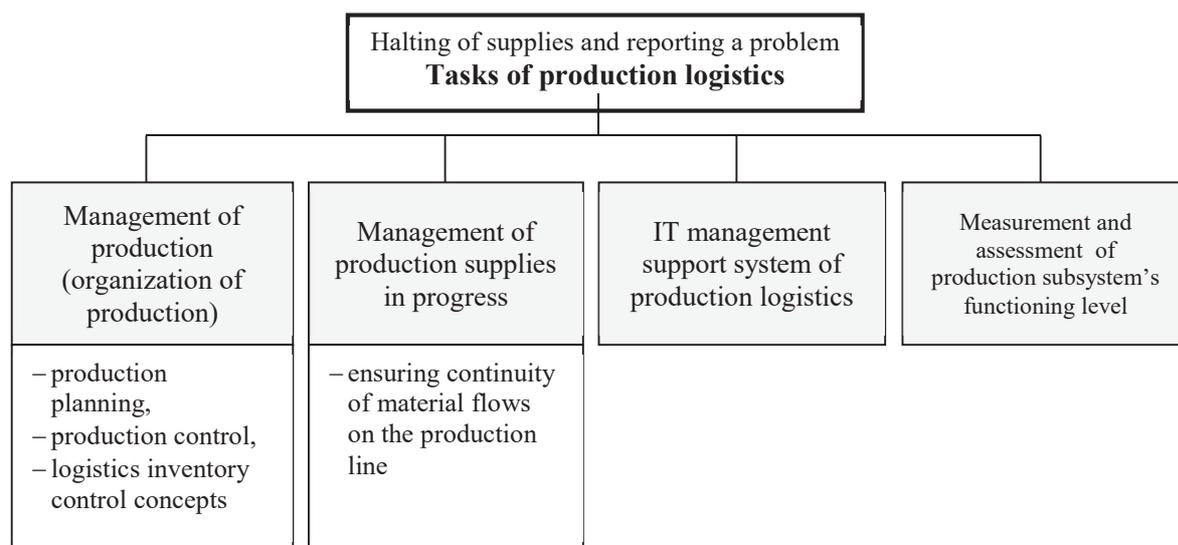
Current competition forces manufacturing plants to use innovative methods and tools and information systems that appropriately support the production and management processes, as well as entire enterprise (Rut, Kulińska, 2013).

Production logistics in manufacturing enterprises is also crucial. It has to ensure optimal flow of materials and information in the production process. It should be noted that this is a very brief description of production logistics tasks. The full scheme includes a wide range of logistics processes arising from different types of production and goals that it has to fulfill (Abt 1998). Its task is to plan, organize and control the flow of raw materials, parts and assemblies for cooperation in the production process, from supply depots, through intermediate warehouses and faculties up to the final finished goods warehouses and sales (Gołemska 2001).

The aim of this work is to assess the production process and the strategic position of the investigated company, taking into account the proposals on optimization of the production process and the development possibility of the organization.

## 1. Logistics of the production process

The main goal of production logistics can be formulated as improving the feasibility and reliability of supply at the lowest possible logistics and production cost. The role and tasks of production logistics depend on many factors, and the proper definition of logistics. Currently in many companies the integration of production planning with logistics is more and more popular (Michlowicz, 2011). The main tasks in the field of logistics of production, is shown in fig. 1.



**Fig. 1. Basic tasks of production logistics.**

*Source: (Nowakowski, 2016)*

Production Logistics is therefore the link between procurement logistics and distribution logistics in units, whose activities include the manufacture or assembly of the products offered. It does not deal with technology production processes. It deals only with efficient organization of the entire system of production and its immediate surroundings storage and transport (organization and operation of manufacturing enterprises remains the responsibility of business economics). Its mission is to plan, organize and control the flow of raw materials, materials, parts and cooperative components during the manufacturing process, from supply depots, through indirect departmental stores and bench until the final storage of finished products and sale (Gołemska 2001). Dealing with production logistics requires a systematic approach which defines the production system (Durlík 1996).

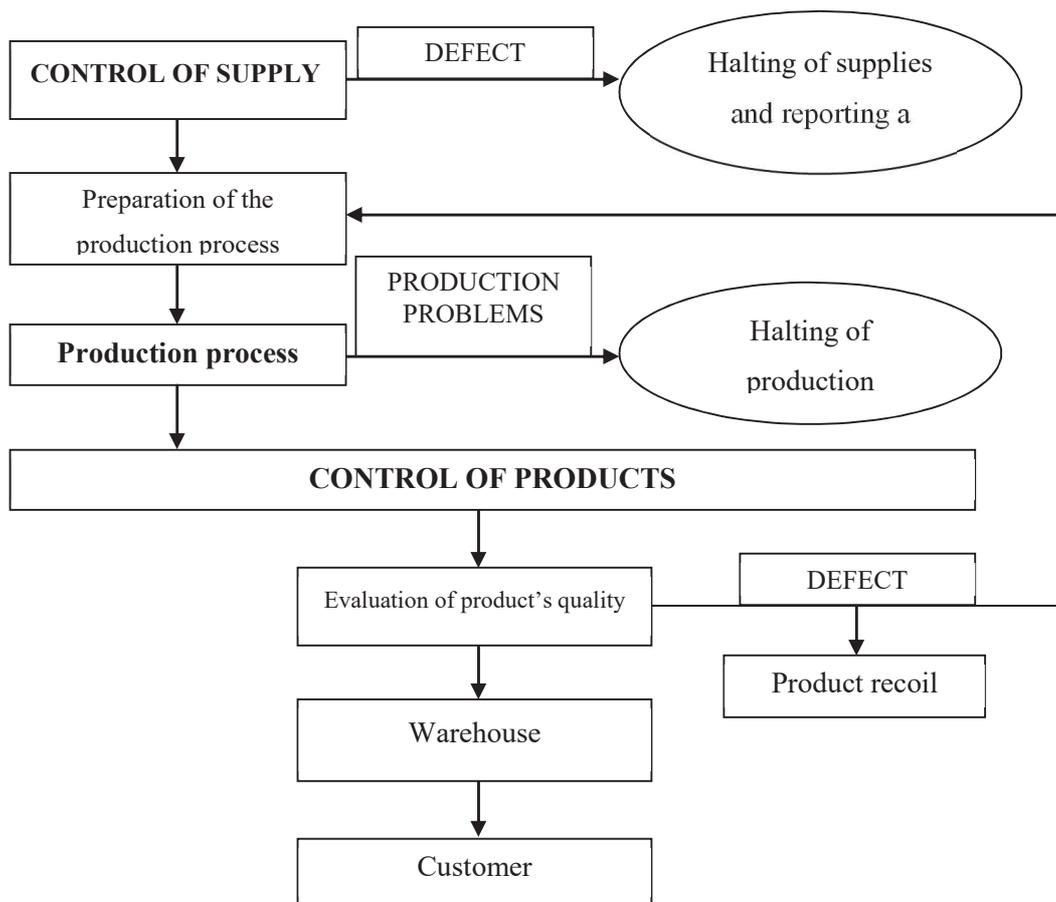
## 2. Production process in the chosen enterprise

The analyzed manufacturing company was founded in 1951. It specializes in the production of metal parts by plastic processing method using eccentric and hydraulic presses, joining metals with such methods as welding and fusion welding, powder coating services and surface preparation.

The production process in the audited company is run solely on the basis of documents and drawings supplied by vendors and customers, as well as other external documentation, which constitute the technical documentation. The production process applies only performance

of products based on documentation and does not carry out related modifications or changes in design documentation and products.

Implementation of the production process is based on production equipment and appropriate working environment, which is: ventilation, proper lighting, etc. Prior to each production stage the production worker is given technological and control documentation related to it by the head of the production department. This documentation is available directly at the workplace throughout the duration of a given stage of production. Simplified diagram of the enterprise manufacturing process is presented in fig. 2.



**Fig. 2. Diagram of the production process in the evaluated company.**

*Source: Own elaboration*

The production process in the audited company includes:

1. Planning of product realization - enterprise plans and improves on the processes necessary for the implementation of new or changed products. This planning is consistent with the requirements of the other processes of integrated management system and includes quality planning, identification of environmental aspects, threat and risk assessment training.

2. The acceptance criteria - are documented in the inspection plans, the acceptance criterion that is adopted is "no defects".
3. Confidentiality - identification of the customer needs regarding the confidentiality of mutual contacts in respect of all cooperation or in its concrete parts.
4. Monitoring changes – when a customer introduces changes to the product or process.
5. Customer-related processes - approving and documenting the specific contracts.
6. Determination of requirements related to the product - are determined by the interdisciplinary team which analyzes the product for the determination of all the requirements related to it.
7. Design and development - design and development of the production process is carried out, excluding design and development of the product. In this process requirements for supervision of the instrumentation are established. The effectiveness of the fulfillment of the requirements process control and analyze internal audits.
8. The input data for the design of the production process - are the results of FMEA (Failure Mode and Effects Analysis - analysis of the types and effects of possible errors) process and technological and control documentation.
9. Review of the design and development (monitoring) - developed by an interdisciplinary team at every stage of the designing process in accordance with the arrangements set out in the design process plan. Each review is followed with the description of its results and decisions on how to solve occurring problems.
10. Verification of design and development of the production process – in order to ensure that the output of design and development meet the requirements specified in the input data, they are subjected to verification in accordance with the arrangements set out in the design process plan.
11. Validation of design and development of the production process - to ensure that the process meets the requirements related to the implementation of the product, it is subjected to validation according to certain criteria and the time requirements specified in the customer schedules.
12. Purchases – assurance that products purchased from suppliers meet specific requirements of the company and come from reliable suppliers.
13. Verification of purchased product - materials are inspected for compliance with the requirements, which is confirmed by the protocol.
14. Production and delivery of services - assurance that the production process is planned and conducted in supervised conditions.

15. Validation of processes for production and service provision - every production process is validated to determine its compliance with the design assumptions. Assessed: how to implement the process and its parameters, production equipment, documentation in the workplace and qualifications of staff. The first validation process occurs in the implementation of the product, and again whenever the resumption of production, or in the case of any changes to the process.
16. Identification and traceability - principles and methods were developed to allow tracking of the various stages of product manufacture from materials in the warehouse until a finished product.
17. Customer property - supervision of intellectual property, product, packaging and tool provided by the customer starts from the moment of its delivery to the establishment, by checking storage until its use for the purpose for which it was passed. Products, tools and containers provided by the customer are in a warehouse on the basis of deposit. These materials are subject to quality acceptance in order to check whether compliance with the requirements is not affected.
18. Product Protection - assurance that the quality of materials and finished products will be unchanged during packaging, storage and delivery. In order to prevent damage and deterioration of the final inspection, compliance with the procedures for handling the product, its storage, packaging, protection and delivery are strictly obeyed.

The evaluation of the functionality of the production process shows that the production process runs smoothly. Quality and safety of the production process is maintained at an appropriate level. The company has implemented an Integrated Quality Management System according to ISO 9001, Environmental Protection System according to ISO 14001 and the Occupational Health and Safety PN-N 18001. Despite well-functioning production process in the audited company, a lot of areas can be improved. At the moment they are not visible but in the future they can contribute to delays and stoppages in the production process. The company should be prepared for potentially adverse situations and have ready solutions using the possibilities offered by modern tools and systems perfecting the enterprises production processes. An important issue in the process of improvement is also involvement of the innovative technologies and knowledge, which is an important element and the main pillar of development.

### 3. Product analysis and determination of the company strategic position

In order to identify the place and role of individual products of the audited enterprise BCG matrix (Boston Consulting Group) was used. It is one of the most commonly used techniques to study the strategic position of the company.

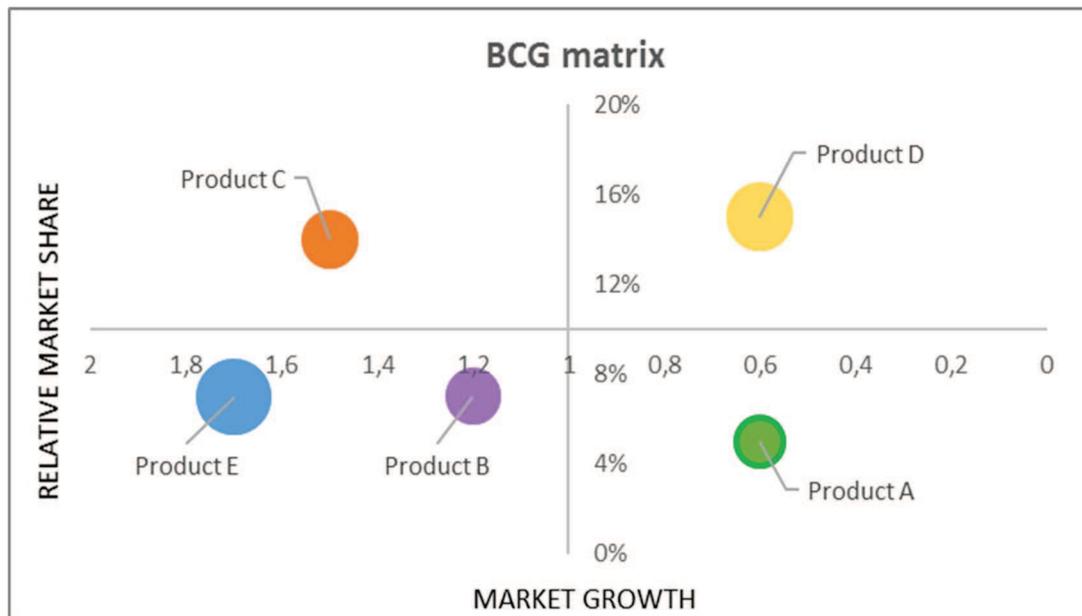
Matrix BGC recognizes products offered by the company in two dimensions. The first is the growth in a market where there are these products, second - their relative market share (Nowak, 2007). Table 1 presents the main concepts of strategic analysis of BCG.

**Table 1. Key strategic concepts in the BCG matrix.**

Changing market share of the product	Market orientation strategy	Market growth rate	Investments	Net Cash Flow
Stars	Hold or increase the market share	High	High	Neutral or negative
Cash cows	Maintain the market share	High	Low	High and stable.
Question Marks	Increase the market share, benefit and withdraw from the market	None or negative, low or negative	High, low or none	Definitely negative, positive
Dogs	Benefit and withdraw from the market	Low	Low or none	Positive

*Source: (Oblój 2001)*

BCG matrix can be used for planning of financial flows within the existing product range, which allows you to rotate the desired direction for the company. BCG analysis helps to detect the risks associated with the unfavorable structure of product range and determine the direction, which will allow for long-term development of the company. BCG matrix prepared for the investigated company is presented in fig. 3.



**Fig. 3. BCG matrix based on data of the chosen enterprise.**

*Source: Own elaboration*

Distribution of products in the BCG matrix can determine the degree of sustainability of the product portfolio in the company. Table 2 summarizes the company data used in the analysis of BCG.

**Table 2. BCG matrix – audited company.**

Product	Relative market share	Market growth	Sale in thousands	Market share	Market share of the largest competitor
Product A	0,6	5%	16	12%	25%
Product B	1,2	7%	18	19%	17%
Product C	1,5	14%	19	36%	28%
Product D	0,6	15%	26	11%	19%
Product E	1,7	7%	33	22%	12%

*Source: Own elaboration*

The analysis using BCG matrix enabled the separation of products and their market share. It shows that:

- Product A - a very weak profitability, you should consider whether to withdraw the product from the market.
- Product E and B - big profitability for the company which means maintaining market position, financial flow positive.

- Product C - increase its market share would allow for an increase in profits of the enterprise it means necessary investments.
- Product D - this product is of the average profitability, would increase their market share.

Profits derived from product E and B should be used for development of product D and strengthen product C. Long-term company strategy should strengthen the position of product C and form from product D new products C. Company should resign or not invest in products A, care and keep the positions of product E and B, in order to give long term profits for the company.

An analysis of BCG makes it possible to optimize production in the analyzed company. BCG matrix provides guidance in relation to which products the company should adopt a strategy of growth, development or expansion, for which the support and co-financing strategy and in relation to which the exit strategy from the market.

The basic idea behind the method is that the competitive value of the participation of the companies in the market depends on the structure of competition, and the life cycle of products offered by the company (Kłeczek, 1992).

In summary, it can be said that the company should invest in development of product E, B and C, and to abandon production of product A, which brings material and financial losses. The current portfolio of production by the enterprise can be called development, since the revenue generated from sales of E and B are very large, which will allow the company in the future to invest in launching new products that will have a chance to become competitive products, and the company will remain profitable despite these investment.

## 4. Production optimization process and business development opportunities

Analyzing the audited company and the possibility of its further development it is suggested to optimize the manufacturing process by the use of the Kaizen philosophy. The philosophy of Kaizen means continuous improvement of work processes and production, looking for the causes of emerging problems and eliminating them. It's a philosophy, which introduces changes for the better and works on every level. Workers involve in improving the activities of the company to gain satisfaction from using their creative skills. At the same time they improve the quality and service of their everyday work, which brings better financial conditions. Kaizen

philosophy is the concept of continuous improvement, which introduces a variety of techniques and rules (<http://www.kaizen-institute.com>).

The next suggestion is the use of Kanban method, which easily allows to visualize the flow of materials within the company. Kanban is to control inventory. This system allows almost total elimination of warehouses. Pre-production, post-production and interoperation storage is negligible, since all materials from suppliers are delivered just in time and the same thing happens when it comes to shipping the finished product.

Kanban system in modern enterprises, is a computerized system. This gives additional opportunities associated largely with issues of quality. Among other things, it is possible to fully identify and trace the product, collect data (eg. the quality records) on a large scale, accurately recreate the production process at every position (Encyklopedia zarządzania 2016).

Another proposal to improve development of the company is the SixSigma concept that allows to eliminate variability, minimize the number of failures and losses, which ultimately impact on reducing the level of customer satisfaction and loyalty in the relationship with the company. SixSigma is based on the collecting data in order to achieve almost perfect quality. It is assumed to identify errors before they happen (Encyclopedia of management 2016). In addition, the system proposes to apply TPM (Total Productive Maintenance), which is defined as maintenance work on machinery and equipment implemented within the whole company by operators and personnel responsible for maintenance. The main goal of TPM is a zero breakdowns and zero defects resulting from the operation of the machine (<http://lean-management.pl/tpm.html>).

## Conclusions

The overall objective of the test production company is striving to produce the best quality of products, improve the efficiency of production processes and meet the expectations of customers.

In assessing the production process of the company it was noted that despite the fact that the production process is working efficiently it can be further improved through the use of Kaizen philosophy or Kanban method. The analysis of BCG showed that the revenue generated from sales of E and B are very large and tested product portfolio of the company is able to grow. The company wishing to invest in new competitive products do not have to worry about engaging in equity in the new production line. In addition, proposed for implementation in the audited company methods and tools such as SixSigma or TPM, will allow to identify potential

failure modes and actions that could eliminate or reduce the possibility of their occurrence. They focus on measures to reduce the risk of manufacturing defects, documenting these activities and the process of remediation.

The benefits from the implementation of tools and methods for improving the company's production process is mainly the improvement of product quality, reducing the possibility of intervention under warranty, reduction of time and costs, documented record of actions taken to reduce risk, increase customer satisfaction, improve company image and increase competitiveness.

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