

## OPTIMIZATION OF LOGISTICS PROCESSES IN THE SUSTAINABLE DEVELOPMENT OF MANUFACTURING ENTERPRISES

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**Purpose:** The aim of the research was to show the importance of optimizing logistics processes in commercial enterprises, the impact of optimizing logistics processes on customer satisfaction was presented.

**Design/methodology/approach:** A combination of several research methods was used. The method of literature analysis was used as the basic research method. In addition, by using the method of observation and the method of examining documents, it was possible to more accurately determine the phenomena occurring in enterprises and to obtain data, the comparison of which would allow to determine the impact of the applied change and optimization of the implemented processes. The supplementary method in the conducted research was the method of interviews with business owners, which made it possible to fill in the emerging information gaps.

**Findings:** The key importance of optimizing logistic processes in commercial enterprises for operational efficiency and competitiveness has been demonstrated. It shows the need to optimize processes in enterprises, the benefits that can be achieved by focusing on processes and becoming a process-mature organization to remain a competitive organization on the market. Company owners' understanding of the importance of process optimization, continuous improvement in this area and the use of modern IT systems is the key to surviving in a dynamically changing market, achieving higher indicators and organizational effectiveness in order to gain a competitive advantage over other entities present on the market.

**Originality/value:** The publication covers the subject of optimization of logistics processes in the sustainable development of manufacturing enterprises in the microeconomic aspect. Combining interdisciplinary research in the areas of management and quality science with economics and finance.

**Keywords:** logistics processes, manufacturing enterprises, sustainable development.

**Category of the paper:** research paper.

## 1. Introduction

Logistics is a very dynamically developing field both in the country and in the world (Murphy, Knemeyer, 2018). Every enterprise or other organization recognizes the importance of logistics in gaining an advantage over the competition. In order to maintain their position in the market, retain existing customers and attract new ones, companies are forced to constantly adapt to changing market conditions in the shortest possible time and with minimal effort and resources. The concept of logistics processes is inseparable from logistics. These, in turn, make up the company's logistics system (Pfohl, 2010). Logistics processes are accompanied by the flow of materials and information, and their management in the company requires diligence, analysis and continuous optimization, because logistics processes are largely interdependent. Organizations that currently operate on the market are trying to adapt to the changing conditions as best as possible, e.g. through the flexibility of operations and optimization of internal processes. It is crucial that the ongoing processes are properly identified, modeled, implemented, controlled and improved so that they bring benefits in the area of profitability, customer satisfaction and achieving competitiveness and even competitive advantage (Bielecki, 2022; Kayikci, 2018).

Process improvement is a consequence of proper controlling, i.e. monitoring and controlling processes. It is an equally important element on the process optimization path (Cherchata et al., 2022). Controlling is also a comprehensive analysis of the functioning of processes in the company and evaluation of these processes (Pisz, 2011). This stage is to give those implementing and managing the process the opportunity to efficiently perform their tasks based on the information collected at this stage. Controlling is also to ensure the achievement of the organization's goals and bring it closer to achieving a competitive advantage thanks to customer orientation. It is supposed to find bottlenecks in order to be able to react appropriately and optimize the process in this respect (Dobroszek, 2010). Thanks to controlling, the achieved goals are to give effects in the form of operational efficiency, operational efficiency, credibility in reports and allow for the implementation of processes in accordance with legal regulations (Bitkowska, 2013).

In process management, it is important to measure the effectiveness of processes in terms of time, quality, cost, flexibility, importance to the company and value to the customer. The consequence of this fact is the introduction of measures, and more specifically Key Performance Indicators (Anand, Grover, 2015). Their task is to measure the achievement of the set goals. The adopted measures are to give a picture of the degree of implemented activities and show the results obtained from the process. Indicators show to what extent the processes have delivered results to give the customer a product that meets his requirements (Grycuk, 2010). The attributes that allow to describe the processes are: process duration, process flexibility, process quality, process cost, timeliness of process implementation, importance for

the organization and importance for the client (Marr, 2012). The duration of the process should be understood as the averaged time of a given process, taking into account all operations and activities included in it. Based on this measure, it can be determined whether employees are sufficiently trained and whether the process is well organized, of course, these may be the reasons, but this is only indirect information and in the case of a decrease in the value of the asset, the reasons should be sought more thoroughly. Flexibility proves whether the process reacts properly to changes in the environment, reacting to changes means, for example, the possibility of improving the process, introducing changes in the process, combining operations. The quality of the process is expressed mainly by the level of customer satisfaction with the results generated during the process. The cost is directly related to the effort put into the process. The timeliness of the process implementation determines whether it falls within the adopted time frame, i.e. it compares the actual time of the process implementation with the planned time. The importance for the organization is related to the revenues achieved, and the importance for the client is related to satisfaction and the difference in the effects obtained as part of the process with the effects of e.g. another organization, which gives a higher level of customer satisfaction (Nowosielski, 2008).

The benefits of implementing and defining indicators include support in the company's decision-making processes and the ability to quickly respond to emerging harmful factors both outside, i.e. in the organization's environment, and inside it (Gozacan, Lafci, 2020). By analyzing the company's activities, you can constantly improve the efficiency of your activities. It is also the basis for comparing the parent organization with the competition, i.e. the basis for benchmarking (Bramham, 2005). Importantly, the use of IT systems is important for the possibility of introducing indicators in the organization. This involves the need to have (collect and store) data in order to be able to analyze it, on the basis of which appropriate levels of indicators can be created and the expected levels of indicators determined. Prepared data should be saved, selected and grouped. Process monitoring is most effective with the use of appropriate IT systems. This allows you to quickly find faults and then react by making adjustments to the process so that it correctly meets the adopted criteria (Jeston, Nelis, 2014).

## **2. Motivation and purpose**

The process method of management is related to the optimization and improvement of processes. In turn, process management is related to the concept of reengineering, lean management, operational management, quality management and others. This is important because elements of process management (identification, modeling, implementation, control,

improvement) appear in various concepts of process management. For example, they show (Glistau, Coello Machado, 2016):

- The Total Quality Management (TQM) method focuses on improving customer service and self-control.
- Business Process Reengineering (BPR) introduces changes by designing processes, focusing on the customer, process improvement, introduces the idea of continuous improvement.
- Active Based Costing (ABC) evaluates the costs of task implementation.
- Active Based Management (ABM) analyzes the activities that make up the process.
- The Strategic Scorecard also focuses on processes that create added value for the customer, sets goals for good process implementation.
- Time Compression Management (TCM) is also customer focused and wants to automate and rebuild processes.
- Just in time (JIT) optimizes production and focuses on offering products at the right time.
- Kaizen is constantly improving processes, introducing small improvements, taking into account the opinion of employees.
- Kanban minimizes the length of the production cycle.
- Benchmarking, improves processes by comparing processes with those of more experienced companies and looking for new opportunities for process implementation.
- A similarly learning organization is supposed to learn by imitating others, but also to constantly improve processes.
- Supply chain management treats decisions, flows and activities in the chain as processes that have allowed their integration.
- Lean Management, streamlining processes by slimming them down.
- Project management based on process management, because projects are a type of processes for which CPM and PERT methods can be used.
- Outsourcing, transferring processes for implementation to external entities, outside the organization in order to better perform them by specialized entities.

Many of the mentioned process management concepts have an approach whose features perfectly or at least partially coincide with the idea and assumptions of the process approach and stages such as improvement or customer focus (Skurpel, 2019).

Process improvement is a stage of process management that must be open to information from customers, employees and management about irregularities in order to be able to react appropriately, often only prepared process models are incorrectly analyzed. Process simulation is also available for process improvement. This allows you to identify weak points in the company and determine the degree of resource utilization. IT tools make it possible to compare several available ways of implementing the process. It is necessary to identify the actual state of processes as accurately as possible in order to create an optimization model that will bring

the assumed benefits and will be susceptible to implementation despite changes in the environment. When reviewing the existing processes in the company, their optimization must bring benefits in the form of increased added value for the customer, but also bring positive changes in terms of efficiency, quality and shortening of time cycles (Dumas et al., 2018; Sgarbossa et al., 2020).

### 3. Methodology

A combination of several research methods was used. The monographic method was used as the basic research method, where a commercial enterprise is a special case. This made it possible to learn about the specifics of this institution and to learn about the logistic processes taking place and taking place in the area of its activity. Thanks to the use of the observation method and the document examination method, it was possible to more accurately determine the phenomena occurring in the company and to obtain data, the comparison of which allowed to determine the impact of the changes and optimization applied on the current processes. The supplementary method in the conducted research was the method of interviewing the owners of the enterprise, which made it possible to fill in the emerging information gaps.

It is worth noting that the questions arising in the area of the research problem result from the relatively low interest in the processes taking place in commercial enterprises, which is associated with the lack of cyclicity of some activities, which makes it difficult to use process mapping. methods, as is the case with production processes. The consequence of this is the willingness to answer the question:

*How do the actions taken to optimize processes in a commercial enterprise affect the company's competitiveness and the level of customer service?*

It can be assumed that the optimization of logistics processes has a positive impact on customer relations and increases the efficiency of the company's operations, which brings the company closer to achieving its goals. Hence, the following research hypotheses were adopted:

- Optimization of logistics processes in a commercial enterprise is important for maintaining the company's position on the market and gaining a competitive advantage.
- Optimization of logistics processes positively affects the company's ability to achieve its goals and the ability to provide customer service at a satisfactory level.
- Optimization of logistics processes contributes to development, i.e. to achieving an increase in the efficiency of the organization.

In the course of the research, the method of analysis and criticism of literature, including the literature of the subject, was also used, which allowed to get acquainted with, among others, with the issues of processes, including logistics processes, stages of the management process, which include their optimization, and what logistics processes can be distinguished in

commercial enterprises. Familiarizing with the available literature and then applying the method of literary analysis and criticism made it possible to determine what is already known and what authors need to demonstrate and learn through research.

Therefore, in order to fully explore the subject and obtain the missing knowledge, the monographic method was adopted as the main research method in order to be able to thoroughly analyze the logistics processes taking place within a given commercial enterprise and what is the importance of optimizing these processes. In order to obtain knowledge about the logistics processes in a specific company, the authors conducted research using the observational method, looking at exactly what processes take place in the organization, what actions are taken as part of these processes, what added value they give customers and what consequences bring changes in their structure.

Based on these observations, it was possible to present the currently implemented processes. In addition, the authors used the method of analyzing the documents they had access to. key performance indicators (KPIs) for selected processes in the company available for viewing, allowing you to compare these processes before and after their improvement. In conjunction with the observation method, it was possible to compare the current state of the processes with the state before optimization.

These methods gave rise to the use of comparative methods to compare the state of logistics processes before the introduced changes and the state after the introduced optimization changes (with the current state). In the conducted study, in order to fill in the information gaps that could not be obtained on the basis of observations or documentation of the enterprise, the method of interviews with the owners of the enterprise was used to obtain reliable information, allowing for the completion of all component data needed to obtain a full picture of the examined problem and the subsequent formulation of conclusions. from the conducted research.

## **4. Results**

On the basis of research conducted in a commercial enterprise, it can be concluded that the optimizations introduced in the logistics processes taking place in the enterprise have a significant impact on the quality of activities carried out by the given processes. This is illustrated by the results of KPI measures obtained in the company, which are part of a separate study. Optimization of the selection of suppliers in the purchasing process, using the point method or the implementation of SRM system support, respectively, resulted in shortening the average delivery time from suppliers or manufacturers to the company's warehouse and increasing the indicators of completed deliveries. The quality of services provided by the suppliers of the surveyed company has increased, which is reflected in the growing values of the indicators of handled complaints, reliability of deliveries and flexibility

of deliveries. The average delays in deliveries and the share of defective deliveries also decreased. It can be concluded from this how important it is to introduce new methods and IT tools to support the process, in this case the purchasing process. The obtained benefits are not only a benefit for the company, but also the possibility of better service for own customers in the audited company.

On the example of observations and collected results from the review of the storage process, the most visible is the importance of investing in warehouse infrastructure - reception, storage, picking and release zones - but also devices and an IT system supporting the warehouse management process. The expansion of the warehouse infrastructure with reloading ramps significantly shortened the time of unloading and loading, which brought measurable benefits in the form of the possibility of making more deliveries to customers at a faster pace thanks to the possibility of handling a larger number of reloadings. Streamlining the warehousing process affects (thanks to the synergy effect and systemic approach to logistics) other processes, such as the process of transport to customers. A faster-loaded vehicle performs better in customer deliveries because it leaves the company's warehouse faster after loading.

The same effect can be observed on the basis of optimization through the labeling of load units and increasing the value of the correct release indicators - correct release of load units to the driver also results in the correct release of goods to recipients. In turn, scanners with data collectors improve the level of order picking. This should include improving the picking time, improving the completeness of prepared products and improving the picking accuracy index - these are indicators that together translate into an improvement in the OTIF index for the warehousing process. Similarly, the use of ABC and physicochemical-based storage methods brought benefits. Implementation of the ABC method shortened the time of placing goods in the warehouse and picking time, and the warehouseman was able to distribute more goods at the same time, i.e. his work efficiency increased.

Taking into account the physicochemical properties, which mean savings in the form of lower loss of value of products, the same effect was brought by the use of the FEFO method, which allows for a lower probability of products with a lost shelf life remaining in the warehouse. In the area of sales, the effects of optimization through the use of an extensive IT system and the collection of orders using tablets with access to the functionality of the system at the company's headquarters were presented again. Synchronization of this tool with the company's system allowed to collect more orders, but also to satisfy customers with the efficiency of service by sales representatives. The ability to check the current stock level meant that the customer's needs were fully satisfied by the completeness of the order placed. In the transport process improvement zone, the procedures carried out always had a positive impact on the level of indicators such as delivery readiness. At the same time, they have led to lower delivery costs, optimal fleet management, shorter delays and average delivery times. Even using the machine to convert defective cartons into fillers has improved the customer

experience by reducing complaints and increasing the likelihood that the shipment will reach the customer intact.

All these optimizations implemented on a large or small scale in the presented company resulted in an improvement in the quality of customer service due to the improvement of the indicators of these processes, which confirms the research hypothesis:

*Optimization of logistics processes contributes to development, i.e. to achieving an increase in the efficiency of the organization.*

It is impossible not to indicate in the conclusions how important the software and IT systems used are in optimization, whether at the stage of purchasing, storage, sales or the transport process. They bring the greatest benefits compared to other improvements, significantly reduce operating costs and increase the company's chances on the market.

The result of these optimizations is the improvement of the company's indicators related to its overall activity and competitiveness. In the subsequent analyzed periods, along with the improvement of process optimization indicators, general company indicators also improved. Sales dynamics increased by 17% compared to the previous year. The indicators of customer satisfaction and loyalty have also improved, and it can be observed that the company has lost fewer customers thanks to the optimization of processes. This results in an increase in the competitiveness of the company, which confirms the truth of the other hypotheses.

## 5. Conclusions

It has been shown that the optimizations made in the surveyed company in the field of processes increase the possibility of meeting the needs of customers, and thus offering them goods and services that better meet their needs. These optimizations allow for even more effective implementation of the 7W rule by the company, which directly translates into increasing the logistics capabilities of customer service and improving the level of service.

The key importance of optimizing logistic processes in commercial enterprises for operational efficiency and competitiveness has been demonstrated. It shows the need to optimize processes in enterprises, the benefits that can be achieved by focusing on processes and becoming a process-mature organization to remain a competitive organization on the market. Enterprises' understanding of the importance of process optimization, continuous improvement in this area and the use of modern IT systems is the key to the enterprise's survival in a dynamically changing landscape, achieving higher indicators and the effectiveness of the organization's activities in order to gain a competitive advantage over the competition.



As process improvements are made, the company's ability to gain a competitive advantage and increase business efficiency also improves. The need for technological and IT progress is the introduction of optimization in this area, using available, modern IT systems that are necessary for the functioning of current commercial enterprises.

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