

## PROCESS MANAGEMENT IN WAREHOUSE MANAGEMENT IN THE COMPANY OF THE SME SECTOR - CASE STUDY

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### Abstract

Material resources management is one of the most important aspects of the functioning of enterprises, particularly the companies of the SME sector. They constitute the greatest economic strength both in Poland and the whole of Europe. An important aspect affecting market efficiency of small and medium enterprises is optimal management of supply processes and warehousing. The analysis conducted in the paper has been to indicate the significance of optimization processes through the appropriate use of available resources and the synchronization of placing orders, implementing the purchase and delivery of equipment and materials in the most effective way to satisfy market needs. This analysis is accepted as the main purpose of the article. The achievement of the desired effect may lead to reduction in financial losses of the company and, simultaneously, allow for an increase in market competitiveness. In her work, the author concentrated on the analysis of the logistics and economic activity of the company operating in the refrigeration sector. In detail, there have been taken into account the considerations in the field of the ways of implementation of the purchase and delivery of equipment from the sales offer of the company and the processes of placing orders for essential goods.

**Keywords:** Process management, warehousing, logistics

### 1. INTRODUCTION

The functioning of the modern economy requires from enterprises a range of changes associated with their market activity. The issue of material resources presented in the paper is a significant factor consisting of many related activities which are essential for the functioning and management of the supply chain. Effective inventory management is a big challenge for entrepreneurs. Therefore, they often use the services of external operators while simultaneously transferring responsibility for these operations. However, the challenge is to take own actions in this field. Through the application of appropriate management methods, entrepreneurs can achieve the intended goals and, at the same time, strengthen their market competitiveness. These activities contribute to effective and rational management of inventories, warehousing processes and, consequently, inventory management of the whole enterprise. While raising the issue of warehouse management, it should be specified what the storage of materials in the company is and what its course is like. There are identified not only the activities associated with the storage of materials in warehouses but also many others: accepting goods, deploying, picking or issuing. Due to rational and effective warehouse management, the enterprise generates profits and also may aim at subsequent levels of improvement.

The analysis conducted in the paper is based on the information obtained from the selected company of the SME sector. The amount of the acquired information refers not only to the procurement process but also a wider activity of the company in the form of implementation of the provided services. The author concentrates on the logistics activity of the enterprise in the specific areas of procurement and storage as well as she discusses the problem of cost calculation for activities in the analyzed areas. The main objective of the paper is the analysis of the logistics activity and optimization of procurement.

### 2. WAREHOUSING AND MATERIAL RESOURCES MANAGEMENT IN THE ENTERPRISE

Apart from the activities associated with warehouse management and the issues concerning the inventories in the enterprise, an equally important problem is the way of management of material resources themselves.

In the case of occurrence of any undesirable errors as early as at the stage of material control, the enterprise finds it out at the stage of further warehousing processes and, consequently, in costs incurred due to delays or other inconveniences. The process of supply chain management is efficiently strongly related to the accurate coordination of material management which, in logistics, is also referred to as the system of procurement and distribution, which is called the system of logistics physical distribution. In the case of the lack of integration at the level of procurement and distribution we deal with ineffective management, particularly in the form of too excessive inventories and unsatisfactory level of customer service. Nowadays, the market environment enforces the flow of any information in both directions. [1]

Warehouse management is the “activity including a set of means, organizational and technical activities and economic tasks associated with the storage of inventories.” [2] The basic functions determining warehouse management, among others, include: [3]

- adaptation, use and creation of storage area,
- accepting and issuing stocks, including transport, complementation, registration processes etc.,
- protecting warehouse against fire,
- protecting stocks against theft or loss,
- use of appropriate technology of storing materials, e.g. ventilation, cooling or air-conditioning.

An integral part of warehouse management are materials or stocks of raw materials or finished products for sale or other materials, stored in warehouses. Enterprises usually aim at minimization of the level of stocks or, if possible, elimination of stocks for fear of incurring too high costs associated with storage. Moreover, inventories can be divided according to different criteria, depending on their destination or their functions. To avoid unnecessary costs and to act effectively, it is helpful to find the inventory management technique which is the most beneficial for the company. Nowadays, it is the problematic logistics department concerning the relocation of inventory between individual links. It refers to the storage of semi-finished products and finished products after the completed production process. Enterprises aim at minimization of the level of inventories by passing them to another partner in the logistics chain. There is a way to get rid of stocks, namely outsourcing. It consists in entrusting the inventory service to the companies specializing in this. However, there is not always an opportunity for the application of outsourcing, mainly, in the area of production since inventories are essential to provide production flow there. Nevertheless, stocks can also constitute so called speculative resources, i.e. they can potentially be the element that will help to increase profits while waiting for demand. [4]

Therefore, it is important to appropriately and effectively manage inventories so that they will not generate any losses or cause problems or delays in the field of order fulfilment. By means of the above, the enterprise can generate the assumed profits. The following objectives can be distinguished for inventory management: [5]

- the ability to ensure an adequate level of service for external and internal customers, considering the quality of service as well as the percentage of all completed orders,
- controlling the future and current demand for all goods which are needed, getting possible to avoid surpluses or existence of the bottleneck in the course of the production,
- possibility of cost reduction through the minimization of the stocks diversity,
- possibility of establishing appropriate volumes of ordered batch,
- cost analysis for maintaining and creating stocks.

Stocks are an inseparable element of the activity of warehouses, which is defined as the amount or value of all raw materials, semi-finished products, components and finished products stored to be used when such a need arises. [6]

### 3. MARKET CONDITIONS OF THE COMPANIES OF THE SME SECTOR

The SME sector is the part of the market including micro-, small and medium enterprises. The definition given by European Commission "The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro." [7] These are companies consisting of only a few or several members whose organizational structure is significantly smaller and simpler than in the case of large corporations. The enterprises of the SME sector can be the ones operating in the production and service sector and others. An important task of the entrepreneur who is the owner of a small company is its effective management to be able to achieve the assumed strategic or organizational goals with limited human resources. Moreover, nowadays, great importance is attached to technical progress. Therefore, the enterprise, to achieve success and stay on the market, should aim at innovation activities. To be able to implement them, it is necessary to take into account any barriers and opportunities and also to possess appropriate funds. An essential element is also IT systems supporting work of this type of enterprises. They significantly facilitate the management of the company since, both entrepreneurs and employees, at any time, are able to monitor if all processes in the company take place according to the established plan. [8]

Currently, the enterprises of the SME sector have great impact on the national economy. On account of their significant number on the market, to define the concept of small and medium enterprises, quantitative and qualitative factors are taken into account. The way in which entrepreneurs manage such organizations is also important since the goals and management strategy should be appropriately adjusted to both internal and external conditions on the market, which significantly affect the economic condition of the company.

The organizational structure of small and medium enterprises is simple, it is characterized by small span, small number of stages of management, one decision-making basis and short channel for the flow of a large amount of information. Such an organizational structure allows for rapid response of the company to different types of changes taking place in its environment and, at the same time, it increases the effectiveness of its functioning. The development of the organization and also the position it may achieve on the domestic market, and sometimes also abroad, depends on the owner of the company who, at the same time, can be its manager. Moreover, their role in the enterprise and the way of its management is really important due to the fact that they are responsible not only for success of the company but also its failure. This is rather difficult since small and medium enterprises are financed largely with own capital, therefore, all constraints associated with the use of company financial resources or market resources are the reason for difficulties in the development of the SME sector. [9] Depending on the economic level of the specific country there is diversity in significance for the SME sector. [10] The enterprises of this type frequently operate as family businesses, i.e. the companies of natural persons or partnerships which do not have legal personality. On the other hand, few of them operate as joint stock companies and legal regulations also have great impact on the way of doing business, the possibilities of its development and financing a business activity. This, among others, refers to taxation, creation of individual accumulation capacity, and also determines the opportunities and availability of sources of financing outside the company. Another qualitative criterion, which also shows the differences between SMEs and large companies is the level of independence of small and medium companies. It is associated with legal and also economic independence of the owner, who undertakes the implementation of different activities on their own responsibility. Other highlighted qualitative properties of SMEs are: relatively small participation in the market, operating mostly on local markets, flexibility and taking innovative actions. [11]

### 4. THE ACTIVITY OF THE SURVEYED COMPANY

The analyzed company is the enterprise belonging to the SME sector which, following the Act on Freedom of Business Activities, can be referred to as a small or even micro-enterprise. The basic activity of the company is to provide services related to air-conditioning and ventilation. Wishing to increase its competitive advantage, while simultaneously aiming at further development and the possibility to satisfy market needs, the company

not only provides the above mentioned services but (since 2008) its sales offer, assembly and service offer also includes air-conditioning, ventilation and cooling products.

An important issue in the achievement of high quality of customer service is the fact that all the employees of the surveyed company are regular participants of many symposiums and professional conferences as well as technical and commercial training sessions, which are run by producers of air-conditioning and ventilation equipment. This is due to growing experience of employees and on account of increasing, for some time, demand of the heating market for economical and ecological heat sources that in 2008 the enterprise had the opportunity to expand its commercial and service offer not only to sales but also assembly and service of devices such as heat pumps and solar panels.

Since the company has gained great experience in the refrigeration sector, they also have some reliable suppliers with whom they most frequently cooperate. Obviously, it happens that the company uses the services of other suppliers to develop and expand its contacts, however, the most often, they work with enterprises they know well to ensure the appropriate course of order fulfilment and provide benefits, at least in the form of discounts for certain products or deliveries.

## 5. COST ANALYSIS OF PROCUREMENT PROCESSES

The analyzed company has its own warehouse where they store SPLIT air conditioners, intended for sale and spare parts and consumables most frequently used for service. Other devices from the sales offer are not stored due to high availability and short delivery time.

The surveyed entity always takes a physical inventory of the possessed devices and parts and closes all orders at the beginning of the year, in January. On the other hand, in February, orders are planned and in the middle or at the end of the month a larger order is placed with the regular supplier - the HAIER company and, at the same time, the purchase of equipment-SPLIT conditioners (being in the sales offer) is made. Such an order is placed due to relatively long waiting time for the delivery of the product to the company warehouse. It is the storage of goods following the maximum delivery method. All purchased goods are usually delivered before the end of March, therefore, the sales of products begins on 1 April. The purchased products are stored in the company's own warehouse and they provide the flow of sales for three subsequent months, till the end of June. The time unit is one month and the demand per each unit has been specified on the basis of the average for the last three years and it is given in the pallet unit. Four devices are placed in one EUR-pallet. The cost of a single delivery from the supplier to the warehouse is PLN 1,200, whereas stock maintenance cost per the pallet unit is PLN 6.30 a month. The total costs are presented in **Table 1**.

**Table 1** The total costs of planned delivery and maintaining stocks

	Termination unit (month)		
	April	May	June
Demand (pallet unit)	7	8	11
Size of delivery (pallet unit)	26	0	0
Stocking fit (pallet unit)	19	11	0
The cost of held stocks (PLN)	119.7	69.3	0
Cost of executed delivery (PLN)	1,200	0	0
The total cost in termination unit (PLN)	1,319.7	69.3	0
<b>The total cost of held stocks and delivery (PLN)</b>	<b>1,389</b>		
<b>The purchasing cost of equipment for a 3 month sale (PLN)</b>	<b>242,536.32</b>		
<b>The total cost (PLN)</b>	<b>243,925.32</b>		

Source: Own calculations based on the data obtained from the company

Since the company keeps on the activities concerning orders in the coming months and its storage capacity is limited, it must complement warehouse shortages on a regular basis. Therefore, for the subsequent three months, deliveries are made following the 'batch for batch' method. Additional air conditioners are purchased from another supplier. Therefore, delivery costs are different from the previous ones. Moreover, from 1 April on, the suppliers introduce new pricelists so the costs of the purchase of equipment are also different, most frequently, higher than the ones at the beginning of the year. Since, from July, the analyzed enterprise purchases additional SPLIT air conditioners on a regular basis, the value of the demand has been given in items, the time unit is a month and the delivery cost amounts to PLN 150, due to small distance between the enterprises. On account of the fact that, from the beginning of July till the end of September, the company has more orders than at the beginning of the year, the costs of maintenance of air conditioners amount to zero. The clear space is replaced with materials completed for order fulfilment. The total costs of the purchase of additional air conditioners in the planned period are shown in **Table 2**.

**Table 2** The total costs in the planned period of 3 months

	Termination unit (month)		
	July	August	September
Demand (pallet unit)	24	28	32
Size of delivery (pallet unit)	24	28	32
Stocking fit (pallet unit)	0	0	0
The cost of held stocks (PLN)	0	0	0
Cost of executed delivery (PLN)	150	150	150
The total cost in termination unit (PLN)	150	150	150
<b>The total cost of held stocks and delivery (PLN)</b>	<b>450</b>		
<b>The purchasing cost of equipment for a next 3 month sale (PLN)</b>	<b>69,829.56</b>	<b>81,467.82</b>	<b>93,106.08</b>
<b>The total cost (PLN)</b>	<b>244,853.46</b>		

Source: Own calculations based on the data obtained from the company

The total costs incurred by the surveyed company in the period of the beginning of April till the end of September (half a year) for the purchase, inventories and delivery of standard SPLIT air-conditioners amounted to:

$$243,925.32 \text{ [PLN]} + 244,853.46 \text{ [PLN]} = 488,778.78 \text{ [PLN]}$$

Another proposal for a change for the analyzed company is the purchase of SPLIT air conditioners for the whole season. Due to increased storage area resulting from the adjustment of deliveries to the schedule of works of fitters, there is enough space in the warehouse to fulfil such a large order. Furthermore, such an activity will not negatively affect the financial liquidity of the company since it possesses funds for the purchase of equipment for another three months. This will allow to obtain 20% discount for all devices, not only for some of them. Also, delivery costs will be incurred once instead of four times as it has been so far.

While referring to the previous information and the assumptions in **Table 3**, there are presented the total costs of delivery and stock maintenance in the case of the purchase of equipment for half a year. However, in such a situation, the cost of delivery of devices to the enterprise amounts to PLN 1,700.

The analyzed company spent PLN 488,778.78 for the purchase of air conditioners, stock maintenance and deliveries in the period of the beginning of April till the end of June and the beginning of July till the end of September. Placing an order for half a year, the company would incur the cost of PLN 440,861.84. Due to this

change, the surveyed enterprise would pay by PLN 47,916.94 less, which means it would obtain 10% of additional profit.

**Table 3** The total cost for optimized supply system

	Termination unit (month)					
	April	May	June	July	August	September
Demand (pallet unit)	7	8	11	6	7	8
Size of delivery (pallet unit)	47	0	0	0	0	0
Stocking fit (pallet unit)	40	32	21	15	8	0
The cost of held stocks (PLN)	252	201.6	132.3	94.5	50.4	0
Cost of executed delivery (PLN)	1,700	0	0	0	0	0
The total cost in termination unit (PLN)	1,952	201.6	132.3	94.5	50.4	0
<b>The total cost of held stocks and delivery (PLN)</b>	<b>1,952 + 201.6 + 132.3 + 94.5 + 50.4 = 2,430.8</b>					
<b>The purchasing cost for a 6 months (PLN)</b>	<b>438,431.04</b>					
<b>The total cost (PLN)</b>	<b>440,861.84</b>					

Source: Own calculations

Reducing the number of products essential for the assembly of ventilation and air-conditioning, delivered to the warehouse, contributes to an increase in storage capacity and, by means of the above, while maintaining financial liquidity, for the purchase and maintenance of inventories, the company could save more than forty seven thousand zloty. Therefore, it is reasonable to analyze logistics systems and explore all possibilities which may contribute to the improvement in the functioning of the enterprise.

## 6. CONCLUSIONS

Market competitiveness of enterprises is an essential factor determining their activity. Therefore, it is very important to thoroughly explore the possibilities of improvement in conducting and managing individual processes in companies. It is particularly significant in the case of the SME sector. A very important issue for each economic organization is to adjust warehouse management to incoming orders and material resources stored in the warehouse. In spite of the fact that the company has been operating on the market for about 20 years, it is growing rapidly and it is a worthy competitor among other companies, its important task is management of materials and storage area to significantly minimize deliveries of products essential for the fulfilment of orders from customers and, instead, maximize the amount of the ordered products from the company sales offer.

In the analytical part, the author has presented cost calculations of logistics activities concerning scheduled deliveries, stock maintenance and purchase of specific goods. Due to obtaining appropriate information it has been possible to make the plan of current costs of the company for the selected logistics operations. Additionally, there has been used the knowledge in the field of the functioning of the analyzed enterprise to carry out the simulation of costs incurred with the optimized procurement system. Information obtained from the analysis allows to consider it as a goal fulfilled. The obtained results have allowed for the formulation of some final thoughts which clearly indicated benefits coming from the activities of optimizing logistics processes.

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