ORGANIZATIONAL ASPECTS OF DELIVERY CYCLE—THE CASE STUDY

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Abstract
The goal of the paper is to present the organizational aspects of the delivery cycle of industrial products for individual customers. The authors conducted their research and analysis in the clothing industry, as a representative of a relatively low level of complexity of products, but also high variety and volatility of demand and high expectations represented by clients concerning efficient delivery, thus functioning in the conditions requiring flexibility and agility of management. It seems that such a model will become common for the majority of manufacturing enterprises. The basis for the paper is analysis of the case study of LPP S.A., however the summary includes a brief presentation of the solution implemented by the Spanish company Inditex.

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1 INTRODUCTION
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The basis of the company's performance is producing products, providing services or a combination of both. Companies plan to achieve goals and manage all of their actions to achieve them, which means they implement the strategy, individually determined by the goals definition. The corporate strategy is the concept of systemic operation, involving the formation of a set of long-term business objectives and their modification according to changes in its environment, determining the resources needed to achieve these objectives and procedures to ensure optimal distribution and use of resources in order to flexibly respond to market challenges and ensure favorable conditions for the existence and development of the company.

The most widely used classification of the corporate strategies is the one developed by M.E. Porter. He identified the strategy of cost leadership, differentiation and concentration. A company that wants to survive in a competitive environment, or develop within it, needs to formulate and implement strategies at different levels and in different specialized management perspectives. This results in a hierarchy of strategies in the enterprise. It includes the corporate strategy, strategy of business conducting and usually a group of functional strategies dedicated to the various functions of the company.

The company wishing to effectively implement its plans, should transform its general strategy and relate it to the individual functions of the enterprise (marketing, production, sales, finance, logistics) and to ensure consistency between the various functions. Allocating logistics among functions of the company shows that the logistics strategies belong to the group of functional strategies. Logistics strategies are subordinated to corporate strategy and support meeting business objectives in the area of logistics. They should also be closely coordinated with other functional business strategies and adapted to its internal situation and the environment. Logistics strategies define how to deal with the development and operation of the logistics system. They provide model solutions for material flows planning, distributing goods, forming relationships with suppliers and customers. These are specific operation procedures composed of certain rules of implementation and evaluation [1].

Considering today's consumers, while maintaining the required quality standards, the most important aspect seems to be the speed of delivery. It is closely related to the location of the material decoupling point. Material decoupling point is a point or a stage in logistics process that separates activities carried out in accordance with the customer's order and the activities controlled on the basis of demand forecasts. In practice, the material decoupling point refers to the physical accumulation of material goods, which is the main safety inventory in the whole supply chain. In the supply chain inventory should be considered the ultimate mechanism for balancing supply and demand. In practice, in contemporary European conditions, the goal is to eliminate situation in which inventory is kept throughout the supply chain, by reducing the number of local warehouses and organizing a small number of regional distribution centers. This allows to centralize inventory and locate it in the material decoupling point in the flow of physical goods [2]. An idea of the material decoupling point is presented in the Figure 1.
The most common variants of the decoupling point location are presented in the Figure 2 to allocate stock in different stages of the physical flow of products in the supply chain. Undoubtedly, delivery cycle is closely related to the implemented variant of the decoupling point allocation.

2 DELIVERY CYCLE AND LOGISTICS STRATEGIES

2.1 LPP S.A. – one of the leaders of Polish textile industry

In the early nineties of the twentieth century the MISTRAL S.C. trading company, and since 1995 it has continued its operations as LPP S.A.. Initially, the company’s business was based on selling t-shirts made in Asia to hypermarkets. The consequence of the development strategy introduced in the LPP was creating its own brand - RESERVED and building their own retail network. The first RESERVED store was opened in 2000, and high dynamics of company’s development made it possible to launch 24 brand shops at the end of 2001.
Currently, LPP's business is design and distribution of clothing, moreover it owns five apparel brands including Reserved, Cropp, HOUSE, MOHITO, SINSAY and a new brand TALLINDER. The company since 2001 is listed on the Warsaw Stock Exchange. The headquarters is located in Gdansk, where there are also design facilities for the brands: Reserved, Cropp, SINSAY and TALLINDER. LPP SA also has a branch in Krakow, where the design facilities for brands HOUSE and MOHITO are located. The company provides its customers with clothing of good quality and latest design. It offers clothing for women, men, youth and children. LPP SA uses several distribution channels for their products. It focuses primarily on retail sales through its own chain stores located mainly in shopping centers. Its products are now available in more than 600 brand shops in Poland and 350 brand shops abroad. The company exports its products to countries in Central and Eastern Europe (Czech Republic, Slovakia, Hungary, Lithuania, Latvia, Estonia, Ukraine, Russia, Romania and Bulgaria). Recently, to the group of export countries joined Germany and the countries of the Middle East (Egypt, Qatar, Kuwait). From 2014 LPP has been benefiting from e-commerce solutions by opening online stores for all its brands. Most of the clothing items offered by the company is produced in Asia on the basis of projects developed by Polish designers. Then mainly by sea they are transported to Poland. From the ports of Gdansk and Gdynia merchandise is sent to the warehouses. Hence, it can be concluded that the company benefits from the concept of "centralized distribution model, in which all customers are served from a single point of keeping inventory - distribution center" [Rutkowski K., 2005, p. 56].

The idea is presented in the Figure 3.

Figure 3. Centralized distribution model

LPP SA is a company that since its inception sought to apply the principle of centralization of storage. Thanks to such approach, better space utilization, higher availability and lower storage CPU was provided [Czubala A., 2001, s.121].

The strategic assumptions taken at the very beginning had to verified, as very dynamic development of the company was the cause of distributing the storage area. Since the company's central warehouse was not sufficient some additional storage space was rented. For formal and organizational reasons, the additional warehouses were customs locked, which unfortunately increased lead-time and influenced customer service level. Further development of the company, the increase in demand for its products and increasing performance requirements towards such logistics functions as transport, storage, sorting and distribution resulted in the biggest investment in the history of the company. In September 2008, distribution center in Pruszcz Gdanski was opened, and in 2014 it required significant extension. The centralized strategy became again the leading logistics solution. As a result, the facility became one of the most modern distribution centers in Europe, both in terms of the complexity of the technology and logistics processes, benefiting from 66,000 square meters warehousing area. The center is equipped with four modern sorting equipment two Bombay sorters, a "Pick to light" sorting department and a "cross-belt" sorter. To support extensive material flows, advanced solutions for information flow needed to be introduced as well. A key functional element of the distribution center is the new warehouse managing system and MFC (Material Flow Control) application as a middleware between the warehouses control and storage system. WMS oversees the logistics process and management of warehouse locations at the level of logistics business, while MFC supports internal flows at the level of the conveyors. The integration of the IT solutions is with the ERP system. The ERP system generates orders for clients, which in the case of LPP SA are the brand shops. The orders are transmitted to the WMS and initiate every cycle of picking orders [Logistyka" nr 4, 2010, p. 39].

According to authors opinion, LPP can be considered a good representative of an industry.

2.2 Logistics strategy as a determinant of a delivery cycle.

The LPP SA is selling five brands of clothing, in an extensive network of retail stores. Clothing offered for sale is designed in Poland and production is outsourced to Asia. The finished product is transported to a distribution center in Pruszcz Gdanski usually by sea. There are also supplies by air or carried overland. All these factors make the lead-time nearly 6 months, which compared to other businesses within the industry is a very good result. Many established competitors in the market obtained the lead-time at the level of 12-18 months.

A very important and very difficult element in this type of business is to estimate demand, which is determined as much in advance, moreover is volatile and fashion-based. The large staff is responsible for the demand forecast, the relevant goods and the image of the salons and the collection developed for final customers. Each brand has its staff of professionals who take care of its development.

The criterion for products differentiation is the season, which makes two groups typical of the clothing industry, i.e. spring - summer and autumn - winter. Quantitative plans of demand are developed for one season and for each brand separately, and defined separately for departments such as women, men, lingerie, accessories and shoes, and taking into account the assortment groups, eg. T-shirts, shirts, dresses, pants, socks, etc.

In order to determine the quantitative demand for each season, for a particular assortment group the following should be considered:

- The number and capacity of existing stores,
- The number and capacity of stores to be opened in the season,
- Average sales of each brand shop, in the case of stores not open yet, it is the expected value.

LPP SA launches new models every day and manages deliveries from the manufacturers, so that each model got to all the brand shops in all the countries to be sold on the same day.
When determining the value of demand for the season it is necessary to take into account the differences between the share in sales of predefined product groups. For example, in the spring – summer season, the share of t-shirts, shorts and other groups typical for summer clothing is substantially larger. In contrast, the share of winter sweaters, warm sweaters, jackets, etc. grows in winter. On the basis of these plans, nearly 6 months prior to the introduction to sale, clothing is ordered from the Far East manufacturers. Orders include a specific number of pieces with a delivery due date to the seaport of Gdansk or Gdynia. Supply calendar is defined so that maximum 2 days after delivery of the container to a distribution center, the product was available in brand shops. The assortment of production is wide. In one season there are several thousand new models of various pieces of clothing introduced to the brand shops. The amount of a given product ordered for the season corresponds to the total number of units of each model ordered. It should be noted that 80% of the number of units ordered for each model is primary stocking up, which is a number of pieces introduced to brand shops for the first time. The remaining 20% is stored in the distribution center. This part will be sent to the brand shops later when the goods from the first delivery are already sold. The described procedure is an example of a strategy with MTS (Make to Stock) decoupling point.

LPP S.A. each day introduces new models to the brand shops and manages the supplies so that the model was introduced to all the brand shops in each country on exactly the same day.

In the figure 4 the comparison of the amount planned for receiving in the distribution center to the amount actually taken in the same period of time is presented. The time scope is the first 20 weeks of 2015. The graph shows that the difference between the amount planned and actually accepted is non-significant. These differences arise only from a delay in the production of clothing, delay in delivery or the lack of complete documentation, which is required for the clearance of goods. These causes are very rare, resulting in the good implementation of the predefined plan.

![Figure 5. The number of goods planned and actually shipped in weeks 1-20 of 2015. Source: own work.](image)

The main causes of fluctuations in demand, which directly affect the demand of goods in the shops include:

- Political or financial condition of society,
- Weather conditions, eg. a long winter or sudden warming,
- Fluctuations in sales associated with the annual holidays,
- The introduction of promotional campaigns in the LPP SA chain stores,
- The introduction of promotional campaigns in competing stores, at the passivity of LPP SA,
- Collection offered to customers.

The unstable demand makes the operational management in the company flexible and agile, to cope with uncertainty.

Fluctuations in the number of units shipped to stores also have a direct impact on the level of stock in the warehouse. When the sale is higher than planned, the inventory decreases. However, when plans are not executed for the extended period of time, inventory increases. Figure 3 shows the stock level in the reporting period.

![Figure 4. The number of goods planned and actually received in weeks 1-20 of 2015. Source: own work.](image)

Looking at the quantities planned to be sent and the quantities actually sent to the entire network of retail stores in the same period of time (Fig. 5), discrepancies are observed in every week. In extreme cases, this difference is more than 780 thousand. pcs., and the average is 282 thousand. pcs.

![Figure 3. Stock level in weeks 1-20 of 2015. Source: own work.](image)

It should be noted that from week 1 to week 13 the stocks gradually increasing. Then in weeks 13-19 is maintained at a similar level and in week 20 decrease is observed. The direct cause of this fact is increase in sales in week 19, which resulted from a significant increase in sales in the retail network.
3 SUMMARY

The fashion industry is a rapidly growing part of the industry. It seems that the most important requirement it faces is fast reaction to changing trends. This is related generally to the need to produce frequently changing collections and high frequency of admission of goods to the warehouses and to retail stores.

The fashion industry is a rapidly growing part of the industry. It seems that the most important requirement market defines for the fashion industry is fast reaction to changing trends. This is related generally to the need of frequent changes introduced to collections produced and high frequency of admission of goods for intermediate storage and retail stores. The above conditions are perfectly met by a Spanish competitor of LPP SA, Inditex. Leading commercial brand of Inditex is Zara. It applies a specific management model, quite contrary to the prevailing logic, not only in the clothing industry, but also in other areas of economic activity. Its core assumptions are the following: a high share of own production, production in Europe, "expensive" logistics and quick delivery to the final buyers. Despite difficult market conditions, resulting from the rapid variability of fashion, and therefore demand, seasonality, intensity of international competition and barriers of organizational nature, volume of stocks of final goods in the company is low, and the scale of seasonal sales is limited. The essence of the company is to provide customers with exactly what they just come to expect. Widely known in the world and present in many countries, the Spanish company pursues a different strategy based on the rapid production and frequent delivery. In practice this is realized by transport within Europe usually filled in the middle of trucks. More than this, twice a week T-shirts and jackets are sent to Japan by air freight. Inditex maintains its own clothing factory, which normally works in one shift (8 hours per day). Spaniards surrendered its logistics and its rules of another general development strategy and market competition. Current fashion trends should soon materialize on the shelves of the retail network - from design through production and organization of deliveries, until the goods display on the shelves of shops may not take more than several days. This example provides a model for future logistics requirements. It is agile and adaptive to changing market conditions and despite the significant costs is able to provide a competitive advantage-sized enterprise as a whole.

Analyzing the individual case of Inditex, some of the practices used in the network may be assessed as doubtful, or even very risky. The number of unconventional solutions is applied in the company. While the vast majority of market competitors in the retail clothing trade benefits from outsourcing, Inditex produces almost half of the products in its European factories. Instead of seeking to increase the volume of production, management quite deliberately allow surplus production capacity. Undoubtedly, this resulted in significant increase in production flexibility. Instead benefiting from the scale of production, Inditex manufactures and distributes products in small batches, allowing customer individualization which is highly valued in the industry. And finally: instead of building market power on the basis of strong partners, the company manages procurement, design, production, storage, sales and the whole sphere of logistics on its own. In addition, the company has consistently shorten the communication path: designers and production planners receive timely information about the expectations of customers and accurate information about the size and structure of the purchase. Perhaps it is the direct information flow is the basis for developing the offer that is expected by the end customer. It is worth noting that the procurement of goods and organization of deliveries is organized according to a fixed and precise "timetable". In this way the company manages to deliver new goods to all shops around the world twice a week. ["Logistyka", No. 5, 2009, p.61].

The logistics strategies of the two companies that can be considered as leaders in the textile industry were described. LPP S.A. and Inditex have the same goal - to satisfy the demands of its customers. They do this by giving them everyday opportunity to choose from hundreds, and in many cases thousands of models of clothes available at authorized stores in Europe. Undoubtedly, each of these companies achieves business goals. But each realizes it in a different way, applying different approach. Key findings are as follows:

- LPP S.A. determines the volume of demand in advance about 6 months and in consequence it has very limited ability to respond to the situation on the market. In the case of low sales, or in the worst case of its absence it experiences rapid grow of its inventory. In the case of increased customer demand for clothing (compared to the forecast) the company is also struggling with a very limited opportunity to respond to this. The delivery time for LPP S.A. is too long to replenish products effectively.

Inditex operates in the short term, i.e. the cycle from design to market launch is only 2-3 weeks, which allows the company to more accurately adjust the volume of production to market demand. If an increased demand is noticed they increasing production volume, and vice versa, when facing decrease in demand, they reduce production volume and, in extreme cases shut it down. Such approach allows to avoid storage or movement of surplus goods for the next season.

- The delivery cycle, from the design of clothing to the introduction of the brand shops is also of great importance when a new seasonal trend emerges. In the case of LPP S.A. ability to respond to new customer needs is very limited. The solution, which is applied in such cases, is benefitting from the opportunity of production in Europe and delivery by land or by air. However, this solution is very expensive and used in a very limited cases. Inditex needs only several days to deliver the hit of the season to its sales network and most importantly - it does not differ procedurally from the standard solutions.

- Comparing the strategy of LPP S.A. and Inditex leads to the conclusion that short-term measures allow for higher accuracy of the forecast. As the cycle of model introduction to brand shops increases, so does the risk of discrepancies between the plans and the actual conditions.

The level of sales in clothing stores is very volatile and unpredictable, resulting in frequent deviations from the forecasted demand. Inditex's production is based on current orders and thanks to that the company may be replenish in the brand shops much faster compared to LPP S.A. In such conditions, the profitability of Inditex should be at a higher level than the one of LPP S.A.

The paper presents logistics strategy of LPP S.A.. The operation of its major competitor - the Inditex company - also briefly described, as it implements completely different principles of operation. Both strategies are very different from each other. However, watching the rivalry of the two companies under the actual conditions, it is
difficult to determine which solution is better. LPP S.A has a difficult task in responding to the needs, market fluctuations, and limited impact on the level of inventories in the distribution center. However, arranging production and transport with 3PL assistance, it is a major player in the textile industry, and undoubtedly one of the industry leaders in our part of Europe.

4 ACKNOWLEDGMENTS

5 REFERENCES


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