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# Competitors' product research for a case company

DEGREE PROGRAMME IN INTERNATIONAL TRADE
2020

| Author(s)<br>Ruotsalainen, Arto | Type of Publication<br>Bachelor's thesis | Date<br>Month Year<br>18.5.2020 |
|---|---|---|
| | Number of pages<br>33 | Language of publication:<br>English |

Title of publication
Competitors' product research for a case company

Degree programme
International trade

The objective of this thesis was to conduct competitors' product research in order to obtain information that will help the case company to determine the type of plastic delineator panel to be launched to the European Union market area. The case company in this thesis was a company based in China, who specialized in manufacturing traffic safety and street furniture products. The customers of the company are mostly European.

The research was conducted as a secondary research using Google as a search engine. All the information of the products was found from the competitors' official webpages. Pictures of the models and information such as product dimensions, weight and manufacturer were collected to reach the objective of the thesis.

The theoretical part of the research conducted discussed value chain as a concept for international advantage and SWOT analysis as well as five forces analysis to gain insight about the company's situation when entering to the market niche with a new product.

As a result of this thesis, broad overview about the competitors' product and propositions for the case company about the product to be manufactured to the European Union market area were given.

In conclusion, the most popular type of plastic delineator panel as well as a proposition for the company in the European Union market area has dimensions of 60x60mm bottom connection and ø42mm top connection for the warning lamp.

The largest companies and competitors in the industry of the plastic delineator panel are WEMAS, Nissen, Schake, Klemmfix, Traffimex and Müba.

Key words
competitor analysis, marketing research, product launching, traffic safety

CONTENTS

# 1 INTRODUCTION

The company I completed my internship at is planning to launch a new product, plastic delineator panel, to the European Union market area. This thesis and marketing research will investigate the competitors and their products in order to gain information that will help the company to design the product. Information such as the biggest competitors, product information and pictures of the different product models will be gathered in the research process. This research is important because without knowing the market deeply enough, the company could manufacture a product that would not be suitable, and a lot of resources and time could be wasted on manufacturing a product which would be hard to sell. The case company is based in China and specialized in manufacturing traffic safety and street furniture. The main customers of the company are located in Europe, varying from online retailers to large worldwide companies.

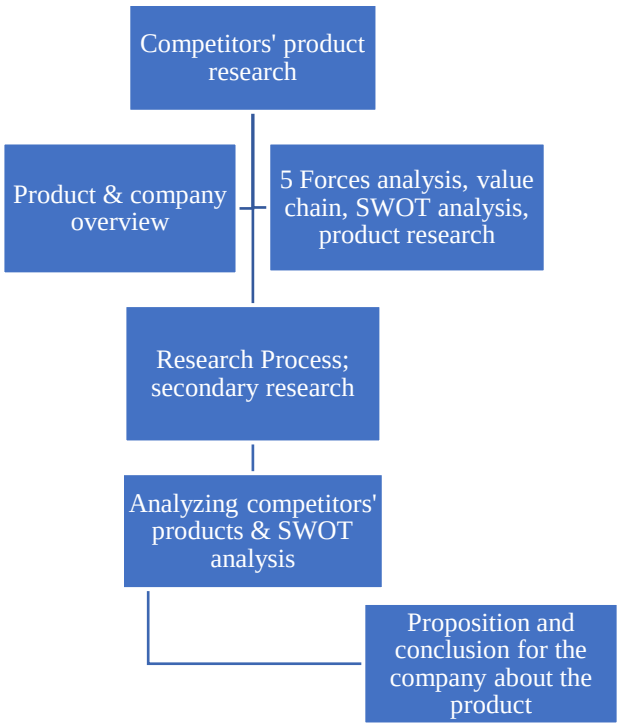


Figure 1. Framework of the thesis. Competitors' product research

# 2 PURPOSE, OBJECTIVE AND BOUNDARIES

## 2.1 Purpose and Objectives

The objective of this thesis is to do marketing research of different types of plastic delineator panel models in the European Union market area. All the possible information about the different manufacturers (competitors) and their products such as features, sizes, pictures and dimensions of the product will be gathered. The goal in the end is to have a proposition for the type of product to be manufactured for the market area.

In the theoretical part, the concept of value chain will be discussed to emphasize the fact that on every activity of the company's value chain there is something that can be done better than competitors in order to gain international competitive advantage as on activity such as this marketing research, and to enhance the understanding between different activities and their relationships. SWOT analysis will be used to gain overall view about the company's strategic strengths and weaknesses when entering to the European Union market area with the new product and five forces analysis will be used to analyze the attractiveness and threats of the market segment of the product and its industry.

The main research problem of this thesis is:

- What type of plastic delineator panel should the case company start to manufacture to the European Union market area?

And the subproblems are the following:

- Which companies are the biggest competitors?
- What measures and features should the product have?
- What are the most used models and brands in Europe?

### 2.2 Boundaries of the Thesis

In this thesis, the prices of the competitors' products or the way of packing will not be analyzed because the information is not publicly available. The thesis will not handle product recommendations separately for each country in European Union. Instead, the aim is to have one recommendation about the type of plastic delineator panel that could fit the best for the whole European Union market area, because the company's plan at the beginning is to have one product mold that could be the most optimal for the entire market area.

## 3 THE CASE COMPANY AND THE PRODUCT

The company specializes in manufacturing traffic safety and street furniture products. The factories of the company are located in China, two of them being focused on metal products and one for rubber products. The product range of the company varies from speed bumps to bike racks. This product, plastic delineator panel, will be one of the company's first steps towards to the road construction related product family. In the future the company's plan is to expand their product range further into that direction. The current customer base of the company is mostly European (90%) and the rest of the customers are spread around the world for example in the United States, Canada and Australia.

The company was founded in 2009 and has approximately 50 employees. The sales offices are located in France and Germany. The main office of the company is located in China and headquarters are in Dubai.

The product, plastic delineator panel, is used on the edges of the road or driveways to guide the direction of driving for example during highway construction projects. The product has reflective film that is meant to reflect the light to enhance its visibility especially during the night. In some models there is an option for a warning lamp. The main end-users of this product are for example road construction companies.

Picture 1. Plastic delineator panels in use (Website of the Knol Akkrum, 2018)

The product is typically available with three different type of reflective film options called RA1, RA2 or RA3. Reflective film RA1, also called Standard Grade, is usually used in slow moving traffic zones for example on no-parking signs or on short-term parking signs. Reflective film RA2, also known as High Intensity Grade, has higher retroreflective values for better long-distance visibility during night. They are used on standard traffic signs and speed restriction signs. The best grade is retroreflective film RA3, also known as Brilliant Grade. It has the highest reflective performance values and therefore is used especially in guidance signs at highways or at other high-speed traffic areas. (Website of the ORAFOL Europe GmbH 2020.)

Usually the manufacturers of the plastic delineator panels order the needed reflective film from companies (suppliers) that are specialized in manufacturing the film and then sticks the film to the panel themselves. Currently, the leaders of the reflective film market are Orafol and 3M. The plan of the case company is to tender the best offer on pricing and quality of the reflective film that will be used on the product. Besides Orafol and 3M, there are also some smaller and less known (Chinese) companies who are manufacturing reflective film who will also be taken under consideration. However, using a known and trusted brand of reflective film could be important for the potential customer in the decision making. The quality of the reflective film is essential because it has to last through many years of different weather conditions.

# 4 PRODUCT RESEARCH AND COMPETITORS

## 4.1 Product Research

Product research provides desired information about the characteristics of a product. It is a type of marketing research that helps companies to find what customers want, so that the product can be tailored to match the needs of the customers. It can also be useful to refine new product ideas. (Website of the MBAskool 2019.)

Product research is also an important part of new product development. In new product development, product research can be used in several different stages. In the early stages it can be used to identify and screen new ideas whereas in the later stages it can help the company to identify the features that are important in the product and the features that are not important. (Website of the MBAskool 2019.)

Competitors can be defined as companies that manufacture identical or similar products that are built and designed to perform the same particular action. (France 2013, 222). General business principles say that a firm should have information about its competition and markets when developing a sales, business, marketing or growth strategy (France 2013, 189).

## 4.2 Five Forces Analysis

The Porter's five forces explains the profitability of industry and determines its structure. It shows immediately how the industry functions, how it creates and how it shares value. (Magretta 2012, 36.) It is also used to determine the underlying long-run attractiveness of a market or its segment (Kotler, et al. … 2009, 304). The five forces are: (1.) the intensity of rivalry among existing competitors, (2.) the bargaining power of buyers, (3.) the bargaining power of suppliers, (4.) threat of substitutes, and (5.) the threat of new entrants. (Magretta 2012, 36.)

Each of the five forces has a distinct and predictable relationship to the profitability of the industry. As a general rule, the more powerful the force is, the more strain it has on the costs and/or prices, and thus more unattractive the industry or market segment will appear to be. (Magretta 2012, 39.)

**Threat of rivalry**: The more intense the rivalry is in the industry, the lower its profitability will be. Rivalry can take various forms in price competition, advertising, better customer service and in new products. (Magretta 2012, 50.) According to Magretta (2012, 50) "If rivalry is intense, companies compete away the value they create, passing it on to buyers in lower prices or dissipating it in higher costs of competing". A segment is unattractive if there are numerous competitors and if these competitors have a lot of investments to stay in the segment (Kotler, et al. … 2009, 304).

Currently the competition among this product and industry is very intense as there are many manufacturers of this type of plastic delineator panel, lowering the attractiveness to the market segment. The competition against the competitors will take place in every form of rivalry, especially in pricing and in better customer service. Most of the competitors have invested highly to stay in the industry which also lowers the attractiveness of the market segment.

**Threat of bargaining power of buyers**: The more powerful the buyers (customers) are, the more they can push the prices down. This situation puts pressure on the company to put more value into the product or service. The profitability of the industry will be lower because buyers will obtain more value for themselves. (Magretta 2012, 41-42.) The more the buyers have bargaining power the less attractive the segment is (Kotler, et al. … 2009, 114).

The potential customers of the case company can be seen as relatively powerful because there are so many competitors in the industry producing similar products. They can order samples and compare the qualities of the products and decide what kind of product they want. They can also tender the prices and delivery times. On the other hand, it can be seen as an advantage if the clients in the industry are not brand loyal, since the company is kind of new in this market niche. Later if the acquired

customers are not loyal to the brand, it can put more pressure on the case company which lowers the profitability. Also, because it is difficult to significantly differentiate the plastic delineator panel from its competitors' products, it may mean that the customers are more price sensitive (Magretta 2012, 43). Therefore, it should be important to have some feature or advantage that differentiates the product from the competitors' products.

**Threat of bargaining power of suppliers**: If the suppliers are powerful, they have more power to charge higher prices or to negotiate more favorable terms for themselves. In both cases, the suppliers will lower the profitability of the industry because they will capture more value for themselves. (Magretta 2012, 43.) Suppliers are powerful if the industry needs them more than they need the industry, if they are large and concentrated, if it is expensive to switch the supplier, or if the supplier can threaten to produce the industry's product by themselves. The more the suppliers are able to raise the price or affect the quantity supplied, the less attractive the segment is. (Kotler, et al. … 2009, 305).

The case company is in a good situation because it is located in China and there are various suppliers available. Because they do not manufacture the product yet, they can still safely compare suppliers' prices to look for the best deal. There might be a risk that some company will copy the product, but it is unlikely that the suppliers are going to do that in order to keep good reputation in the business. Also, the suppliers would not have easy access to the industry and the business, and they do not have the same advantage as the case company has in having European connections and management.

**Threat of substitutes**: Substitutes are products that meet the same need as the company's product but in a different way. This means that the substitute products are not direct rivals and that they usually appear from unexpected places. Substitutes set the limit for the profitability of the industry. (Magretta 2012, 46.) A segment is less attractive if there are actual or potential substitutes for the product (Kotler, et al. … 2009, 305).

In a way, the plastic delineator panel has lot of substitutes that could be used instead of it. For example, road construction projects could use another type of guiding method

or sign. Because the product is in standardized use in road construction, it is hard to imagine any alternative methods would tackle the need of the plastic delineator panel in the near future.

**Threat of new entrants**: The most attractive segment is one in which the exit barriers are low and entry barriers high. Then few new firms can enter the industry, and poorly performing companies can exit without pain. (Kotler, et al. … 2009, 304.) Entry barriers protect the industry from newcomers who would offer new capacity and seek to gain market share. The threat of entry affects the profitability of a company in two ways. It limits the prices of the product because higher price would attract more newcomers. Secondly, the existing companies in the industry will have to spend more time to satisfy their customers which discourages new entrants by raising obstacles they would have to clear in order to compete. (Magretta 2012, 47-48.)

When the case company will launch the product, the threat of new entrants is high, because many companies can start to manufacture the same type of product as well. The good side is that the exit barrier of the product is not so high if the product will not succeed on the market because the case company has not invested to this segment with high stakes. Once the company has entered into the segment with the product, they have to figure out ways to satisfy their customers in order to keep the customers and to raise the entry barriers for newcomers. At this point, it is good for the company if the entry barriers are low, because the company itself is the new entrant and threat for the existing manufacturers (competitors).

# 5 THE CONCEPT OF VALUE CHAIN

In 1985, Porter developed the concept of the value chain to define a general structure of value-adding activities for product flow within the company. Value chain includes both physical product flows (logistics and operations) and marketing (sales and marketing, and service), increasing value as the product moves towards the customer. Value comes from any activity that increases the worth of the product in eyes of the

final customer. Those activities can include the manufacturing of the products, quick delivery, availability of the product, or any after-sales service. (Skjott-Larsen 2007, 43-44.)

The value chain can be used as a framework for identifying international competitive advantage. Value chain is a categorization of a company's activities that are providing value for the customers and profit for the company. The activities of any company can be divided into nine different categories. At every stage of the value chain there is an opportunity to do something better or different from competitors' offers to have uniqueness or advantage in the market. (Hollensen 2016, 28.)

According to Herr & Muzira (2009, 3), "value chain describes the full range of activities that are required to bring a product or service from conception, through the intermediary phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final customers, and final disposal after use". The term value chain itself stands for the fact that the value to the preliminary product is added through combination with other resources (for example utilities, manpower, know-how and skills, other raw materials, or preliminary products). When the product passes through different stages and activities of the value chain, it creates the value of the product. (Herr & Muzira 2009, 3.)

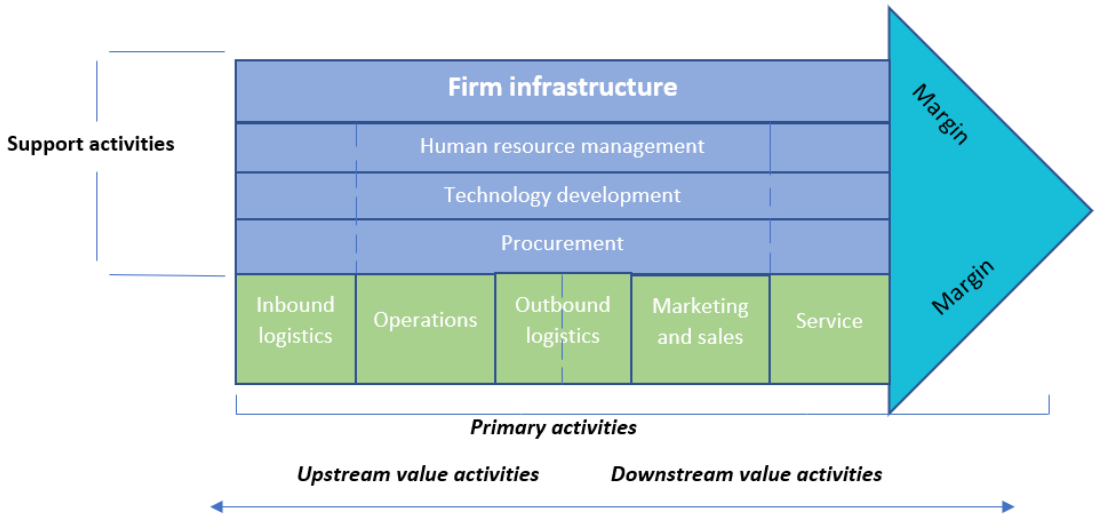


Figure 2. The value chain (Hollensen 2016, 28)

The value chain includes both cost and value drivers. Drivers are the underlying factors that explain the reasons why the cost/value generated by a company's activities differs

from its competitors. In competitive terms, value is the amount that customers are willing to pay for a thing that a company provides them with (perceived value). Basically, a company is profitable if the value of a product or service exceeds the costs that were involved in making the product. The goal of any synergic strategy is to create product that creates more value to customers than costs creating the product. Sometimes the value, instead of cost, is used when analyzing the competitive position. This is because often companies raise the costs on purpose in order to have the premium price through differentiation. (Hollensen 2016, 29.)

Also, the value chain includes activities such as production, design, marketing, distribution and support services up to the final customer (and sometimes even beyond if the recycling activities are considered) (Herr & Muzira 2009, 3).

Before taking a deeper look into the details of the different value chain activities, it is important to understand that a company's value chain is embedded in a larger stream of network activities in the total supply chain. All the firms, such as suppliers, business customers and the company itself that are involved in the process of making the product from raw materials to delivering the final product to customers have their own value chains. (Hollensen 2016, 29.) The activities in the chains can be contained within a single company or split amongst different companies, as well as within a single geographical location or spread over wider areas. (Herr & Muzira 2009, 3.)

The value chain was first introduced in Michael Porter's book, Competitive Advantage, in 1985. It was introduced as a tool to analyze organizations. It was a breakthrough contribution to management because it sympathized the value creation through the activities that a company performs and how the activities interact to create value to the final customer in order to gain competitive advantage. It must be said that the Porter's generic value chain is very straightforward and clear, and it has been significant factor to our understanding of how companies should operate in order to achieve a competitive advantage. (Presutti & Mawhinney 2013, 1.)

In Porter's concept, the value chain displays total value, and it consists of value activities and margin. Value activities can be defined as technologically and physically distinct activities that a company performs and uses to make a product valuable to its

buyers. Margin indicates the difference between the total value and collective costs of activities. (Hollensen 2016, 29.)

Competitive advantage may be defined as a function that generates value more efficiently to a comparable customer than the competitors, or as performing activities at the same cost but in a unique way that brings more value to the comparable customer than the competitors, and thus to define premium price (differentiation). From the value chain, the company might be able to identify the elements that are too costly. In these cases, the company can outsource these elements to be done outside the company to reduce the costs. (Hollensen 2016, 29.)

Value activities can be divided into primary and support activities. Primary activities are the activities that are used in creating the product, selling the product, transferring it to the customer and after-sales assistance. These primary activities can be divided into five different categories: inbound logistics, operations, outbound logistics, marketing and sales, and services. Support activities are the activities supporting the primary activities by providing paid inputs, human resources, technology, and various firm-wide functions. The infrastructure of a company supports the entire chain but it is not associated with the primary activities. (Hollensen 2016, 29.) The support activities in Porter's value chain are split into four support activities including: a firms' infrastructure, human resource management, technology development and procurement. (Presutti & Mawhinney 2013, 2.)

## 5.1 Primary and Support Activities

**Primary activities**

The primary activities of a company are divided into five main categories:

1. Inbound logistics. The activities related to receiving, storing and distributing inputs to the product or service. This includes providing materials, handling, transport and stock control.
2. Operations. Inputs to the final product/service – for example, testing, packaging, assembly and machining.

3. Outbound logistics. Storage and distribution of the product to customers. For physical goods this would include handling the material, warehousing and transport. For services it would be more concentrated with arrangements bringing the customer to the service if the location is fixed, for example to trade show.
4. Marketing and sales. Actions that make customers aware of the product or service and allow them to be able to purchase it. This involves advertising, sales administration and selling. Often communication networks that help users access particular service are important in public services.
5. Service. All the activities that increase or maintain the value of the product/service. After-sales services consists of the following: the installation and start-up of the purchased product, the provision of spare parts for the products and repair services, technical advices, and the provision and support of warranties.

Each of these five main areas of primary activities are connected to support activities. (Hollensen 2016, 29-30.)

**Support Activities**

These can be divided into four main categories:

1. Procurement. Process of obtaining the different resource inputs for the primary activities but not the actual resources themselves. Procurement occurs in many parts of the company.
2. Technology development. All the activities in the value chain have a technology, even if it is simply knowledge, such as ‘know-how’. The key technologies may be linked directly to the product (e.g. product design, R&D), with processes (e.g. process development) or with a certain resource (e.g. raw material improvements).
3. Human resource management. This is an especially important area that excels all the primary activities. Human resource management includes all the activities in training, recruiting, developing and rewarding people inside an organization.

4. Infrastructure. The systems of finance, quality control, planning, etc. are essential to the strategical competence in all primary activities. Infrastructure consists also of systems and methods of activities that perceive its culture.

As shown in Figure 2 about value chain, differentiation is also made between the more marketing-oriented, ‘downstream’ activities and the production-oriented ‘upstream’ activities. The next Figure 3 is a simplified version of the value chain and it contains only the main activities of a company. (Hollensen 2016, 30.)

Despite the value activities that are the building blocks of competitive advantage, the activities in the value chain are not independent of each other. Instead, value chain is a system of interdependent activities. (Hollensen 2016, 30.)

As Michael Porter notes:

“The value chain is not a collection of independent activities but a system of interdependent activities. Value activities are related by linkages within the value chain. Linkages are relationships between the way one value activity is performed and the cots or performance of another.” (Presutti & Mawhinney 2013, 2.)

In value chain, value activity is connected with horizontal linkages. These linkages are relationships that shows how the value activities are dependent on each other’s performance. (Hollensen 2016, 30.)

The order of the activities is not always chronological in the value chain, like shown previously in Figure 1. In some occasions, sales and marketing functions may take place before the production if the product is ordered before the production of the final product (built-to-order). (Hollensen 2016, 30.)

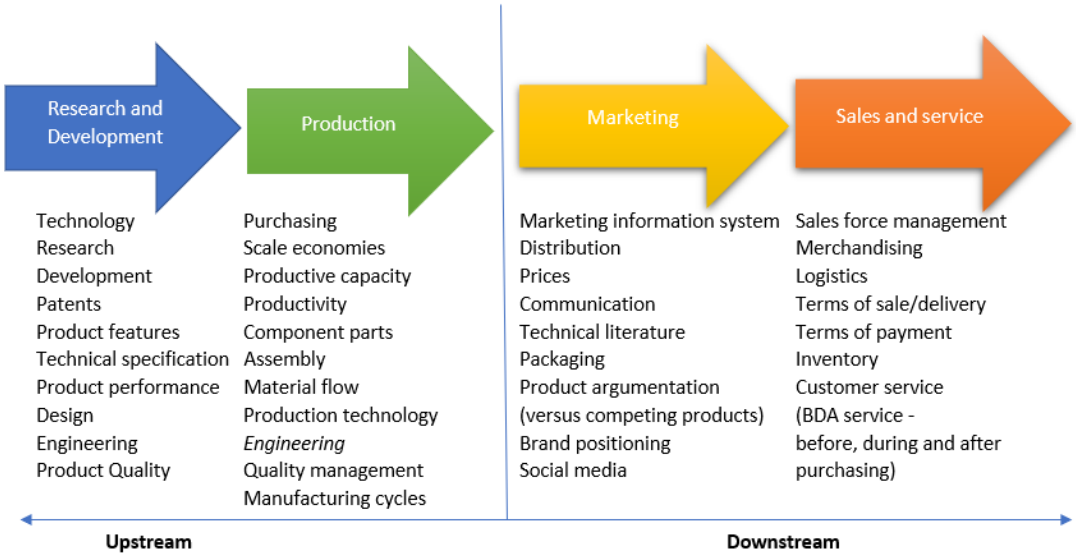


Figure 3. Simplified version of value chain (Hollensen 2016, 31)

## 5.2 Internal and External Linkages

To be able to understand the competitive advantage of company, the strategic importance of the internal and external linkages should be analyzed in order to assess how they affect the cost reduction or value added (Hollensen 2016, 31).

1. Internal linkages are between the activities in the same value chain, but possibly in other planning stages within the corporation.
2. External linkages are between diverse value chains 'held' by the different actors in the total value system. (Hollensen 2016, 31.)

### Internal Linkages

There might be important linkages between the primary activities. Decisions and choices are made based on these relationships and how they impact on the strategic capability and value creation. For example, a decision to keep large amount of stock might help scheduling the production and provide faster delivery times to the clients, but also it might increase the total costs of operations. It has to be evaluated if having bigger stock is more beneficial than the increased costs from it. Sub-optimizing single value chain activities should be avoided because the activity might be in relationship with another activity and hence optimizing it might reduce the competitiveness of the

other value chain activity. For example, when operation activities and market activities are analyzed and assessed independently. The operation activities might seem good because the production is set to be high-volume, low-variety and low-unit-cost, meanwhile the marketing team might be selling flexibility, variety and quickness to clients. Separately they look good, but when analyzed together they appear to be the weakness, because they are not in harmony and the value chain always requires harmony. The link between support and primary activity might be the core of the competitive advantage in the company. (Hollensen 2016, 31.)

External Linkages

Rarely a company does all the value activities by themselves from product design to delivering product to the final customer. Often companies can be part of a wider value system that creates the product. In order to understand how the value is created the firm's internal value chain should not be looked at alone. A big part of the value creation will take place in the supply and distribution chains, and this entire process must be investigated and understood. Suppliers have their own value chains that generate and provide the purchased inputs that are used in the upstream part of a company's value chain. Suppliers can also influence the company's performance in various different ways, more than just by providing the product. Besides, when the products are on the way to the buyer, the products pass through different value chain channels. These channels perform additional activities that affect the customer and impact the company's own activities. The company and its product's role in the buyer's value chain, determined by the needs of the customer, is the fundamental core of the differentation. To gain and sustain competitive advantage, understanding only the company's value chain is not enough. It is also important to know how the company fits into the overall value system. Often there are situations where value can be increased or the overall cost can be reduced by making collabarative arrangements among different businesses in the value system. This is usually the thinking behind down stream collabarative agreements such as in joint ventures, outsourcing, and subcontrating between different companies. (Hollensen 2016, 32-33.)

Product quality and product differentiation are two of the five drivers of change of value chain development. The other three are system efficiency, social and environmental standards and business environment. (Herr & Muzira 2009, 4.) Because

this thesis is related to the product, only the two drivers, product quality and product differentiation, will be discussed.

1. Product quality

   Markets are changing rapidly and competition is getting harder. If companies want to stay in the business, they have to ensure that their products/services meet the continuously changing customer requirements and demand conditions. The thing that matters is the final product the customer receives and the level the of satisfaction it creates. Value chains can compete against each other in the means of product quality and/or production costs. (Herr & Muzira 2009, 5.)

2. Product differentiation

   The better the people cooperate and coordinate in their value chain activities, the more difficult it will be for competitors to copy their product and its process – because in this case, it is not only the product they have to copy, but the whole system. That is why it is important to understand what competitors are doing and how they are doing it, and then to find a way to gain competitive advantage over them. This is a matter of constant inventing and learning inside the value chain and of the question, how do I make my products different and better from competitors' products. Innovation and developing must be made through the entire value chain if company wants to be competitive on world markets. (Herr & Muzira 2009, 5.)

As mentioned before, every company has its individual value chain. This thesis and research phase belongs to the first phase of the value chain, into the "research and development", which is the starting point in the value chain. Every part of the value chain connects to the next one and therefore by doing this research it may lead to a competitive advantage on the later phases. As Hollensen (2016, 28) says that at every stage of the value chain there is an opportunity to do something better or different from a competitors' offer in order to have uniqueness or advantage in the market. The purpose of this initial research stage is to use the information gained to develop product that is valuable to its customers and is better from its competitors' products. The research can help to gain competitive advantage in the market and also to use the

gathered data later for marketing purposes. Also, the product feature that might be developed by the help of this research can later be the thing that the marketing team and salesperson will use to sell the product. This way the whole process is connected to the marketing and sales and service activities and hence to the whole concept of value chain, which is used to define value-adding activities and to recognize international competitive advantage (Skjott-Larsen 2007, 43-44; Hollensen 2016, 28).

# 6 SWOT ANALYSIS

The SWOT (strengths, weaknesses, opportunities, and threats) analysis is commonly used for analyzing the results of external and internal environments (Paul, Cadle & Yeates 2014, 49). The SWOT analysis may be used as a framework for systematic analysis and to consider alternative strategies (Andersen 2013, 64). However, it should not be used as the first analytical tool before preliminary analysis has been done. When SWOT analysis is used as a first approach, the results are usually weak, uncertain and not solid enough to be much use. Thus, the SWOT analysis is used to summarize the main strengths, weaknesses, opportunities and threats in order to have an overall view about the strategic position of a business and its environment. (Paul, Cadle & Yeates 2014, 49-50.)

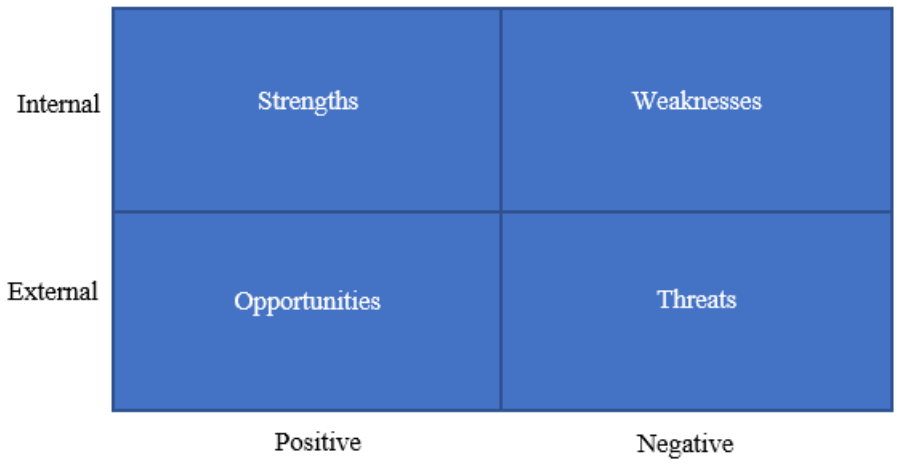


Figure 3. Format of a SWOT matrix (Paul, Cadle & Yeates 2014, 50)

It is important that the language used in SWOT analysis is brief, and that the strengths and weaknesses are linked to crucial success factors that can be measured against the competition. All the statements used in SWOT should be precise, realistic and backed up with evidence. A few examples of it could be (not for the same company):

- **Strengths** – Strong branding of the product – market research shows that a brand is more known compared to the competitors' brands. We have the best coverage in all branches of the top 10 vendors.
- **Weakness** – Poor cash flow. Compared to industry benchmarks, we are in the bottom quartile. Our overdraft limits exceed on 20 days every quarter.
- **Opportunity** – Demographic change in Asia and Australia will provide a better market for our services.
- **Threats** – Low market growth may make the poorest functioning companies collapse.

A main thing to notice from these examples is that strengths and weaknesses are found internally from the company while opportunities and threats are found outside of the company. (Paul, Cadle & Yeates 2014, 50.) *Strengths* refer to internal factors that increase the competitiveness of the company and strengthen its position in the market. *Weaknesses* instead refer to factors such as shortcomings, flaws and limitations that makes the company less competitive and prevent it from achieving its main objectives. *Opportunities* refers to external factors such as new types of product demand, technologies, market niches, etc. that can improve the company's competitive advantage. *Threats* refer to inventions, regulations, economic situation, etc. that may endanger the company's competitive position. (Andersen 2013, 65.)

It is crucial to achieve the balance between the internal and external analysis. Making changes based completely on external analysis might lead to drastic changes but without any guarantee that the change will be fruitful. Basing the decisions only on internal analysis may lead to little or no change, or the changes that are internally focused might totally ignore the needs of the buyers. Using both internal and external analysis, the results are more balanced and more likely to help in achieving successful strategic direction. (Paul, Cadle & Yeates 2014, 50.)

# 7 RESEARCH PROCESS

The main research methods are quantitative and qualitative research. Quantitative research is often used as a synonym for a method that generates or uses numerical data through any data collection technique (e.g. questionnaire) or data analysis procedure (such as statistics or graphs). Whereas qualitative research is often referred to as a method that generates nonnumeric data through any data collection technique (e.g. interview) or data analysis procedure (such as categorizing data). (Saunders, Lewis & Thornhill 2019, 175.)

The primary research methods, qualitative and quantitative research, may be used if the answers to the market researchers' questions are not answered by secondary data. Then it may be necessary to collect additional information and data by qualitative research or quantitative research. (Hollensen 2016, 193.)

## 7.1 Secondary Research

The method used in this research was secondary research, because it best suits the research objective: to collect information and data about competitors' products and to get familiar with the products in the industry to help the company to design the product for the European Union market area. All the information about the products were found from the competitors' official company webpages.

In secondary research the sources that are used contain data that has been collected and used for another purpose and the secondary data consists of information that others have collected and made available through websites, magazines, journals, books and other publications (Krishnaswamy & Satyaprasad 2010, 86; Clippinger 2018, 77).

The way to find competitor companies and products was simple but it took a lot of time and effort. Of course, it helped that at the beginning of the research the case company already knew some competitors in the industry (Wemas, Nissen, Schake, etc.) and mentioned them.

The first of the research process was to find keywords about the plastic delineator panel in different languages and collect the working keywords to an Excel file. The way to determine if the word was efficient was to have a look at Google's image search and to note if many pictures of the product appear in the search. After this step, the keywords were used in a search and all the websites of the searches were opened and then the found websites of the companies who were either selling or manufacturing plastic delineator panels were collected to the Excel file and separated by country.

The key factors in the products of the competitors that were noted are the design of the model, features, size and picture of the product. Weight of the product is especially important to note because it indicates how much material (plastic) is used in the product. The amount of plastic used is a significant factor of the price. For example, the lighter the product is, the more cost-effective it will be to manufacture and deliver. Shipping from China to Europe is a long way and the shipping costs can have significant differences depending on the weight of the freight.

Another reason for collecting the pictures of the product besides learning the market trend is that the pictures can be used to learn the differences between the different models and manufacturers and to recognize from whom the sales prospect buys from. Then the sales offer can be targeted more accurately and competitively. For example, in a situation when it is recognized that the prospect has a product from Schake and the selling price of Schake is known, lower price for the prospect client can be offered which increases the chances to close the deal.

Later the case company can find product samples of the competitors' products to compare quality and designs to have ideas for the new product model to be manufactured.

## 7.2 Validity and Reliability

The value of research depends on the validity and reliability of the data gathered for the research (Clippinger 2018, 75). Reliability and validity are important because they ensure that the research findings and results are believable (Saunders & Lewis 2018,

13). Validity can be defined as: “extent to which (a) data collection method or methods accurately measure what they were intended to measure and (b) the research findings are really what they profess to be about” (Saunders & Lewis 2018, 134). Whereas reliability can be defined as: “extent to which a data collection methods and analysis will produce consistent findings” (Saunders & Lewis 2018, 135).

The findings of the products were conducted from official company webpages and therefore the information about the products may be seen as reliable. All the websites that were used were up to date, which adds reliability of the gathered data although as time goes by, the product models might change and the research findings may get outdated. Sometimes reliability is seen as evaluation of whether the same research results would be obtained if the research were repeated (Quinton & Smallbone 2006, 129). The used research method was web-based search with Google as a search engine and according to Quinton & Smallbone, using a search engine as a tool, there tends to be lack of consistency in results (Quinton & Smallbone 2006, 72). Because the research was conducted as a secondary research, there was not any usual factors that may have threatened the validity of the research (Saunders & Lewis 2018, 135).

# 8 RESEARCH RESULTS

As a result of the research, total of 536 companies who are either retailers or manufacturers of the plastic delineator panel, were found and listed to the Excel file. An example of the conducted Excel file can be seen in Appendix 2.

The largest competitors for the reflective plastic delineator panels are the following companies: Wemas, Nissen, Schake, Müba, Traffimex and Klemmfix. They all very well-known companies in the industry and each company manufactures their own model of plastic delineator panel. Some of the less known plastic delineator manufacturers are: Kwazar, Vaivora Ir Ko, Beilharz and Val Plastika.

During the research it could be noticed that the most popular brands in Europe are WEMAS, Nissen, Klemmfix and Schake. Müba is also popular but mostly in Germany and Traffimex is popular mainly in Belgium. In countries such as Poland, Italy, Czech, the product is popular but there are various manufacturers that are smaller and less significant. The industry is very competitive as there are various manufacturers and there is no obvious leader in the market even though WEMAS seems to be the largest by a slight margin.

The plastic delineator panel is placed on a stand made of recycled PVC. Often the stand is a base plate that has different size of holes such as 1x60x60mm, 3x40x40mm and hole of Ø42mm. The amount and measures of the recycled PVC base plate holes can vary depending of the model and manufacturer.

Mainly there are two types of plastic delineator panels on the market. One where the bottom connection size is different from the top connection size and it is possible to attach a warning lamp on the top of the panel. The other model is known as ‘reversible plastic delineator panel’ and it can be placed on the base plate both ways because the top and bottom connection of the delineator panel are the same size (either 40x40mm or 60x60mm). The advantage in the reversible delineator panel is that the reflective film is needed only to the other side of the panel and it saves time because the panel can be quickly turned around to change guidance direction of driving.

As a conclusion, the most common model is the model with 60x60mm bottom and top connection of ø42mm, except in Belgium the model with 40x40mm bottom connection with supporting steel tube inside is more popular.

The proposition for the case company is to start to manufacture the plastic delineator panel with dimensions of 60x60mm bottom connection and ø42mm top connection for the European Union market area. It also should be considered that the reversible type of delineator panel is also very common among the companies in the industry.

## 8.1 Competitor and Product Information

### WEMAS Absperrtechnik GmbH

WEMAS is a German company founded in 1971 as a trading company for tool technology and machines. In 1978, the company expanded to manufacture road safety products. (Website of the WEMAS Absperrtechnik GmbH 2020.) The company has 90 employees and revenue of $59 million (Website of the Gimv 2020). The company advertises that their products, production and processes and people are what have made them a market leader by a clear margin. While conducting the research it was easy to note that WEMAS is the most popular plastic delineator panel manufacturer in Europe. All the core products (more than 85% of the product portfolio) are made in Gütersloh, Germany. WEMAS is manufacturing six types of plastic delineator panels, but in this study, only two of their export models will be noted, because the rest of the models are aimed only for the German market. (Appendix 1) (Website of the WEMAS Absperrtechnik GmbH 2020.)

### Schake GmbH

Schake is one of the biggest players in the market after WEMAS and Nissen. Their plastic delineator panels are spread into many countries in Europe. The company is a family enterprise located in Germany founded in 1908 by Johann Schake. (Website of the Schake Gmbh 2016.) At first it focused on manufacturing building hardware. Turnover of the company is approximately $36 million (Website of the Manageo 2020). Schake is said to be a synonym for progress, customer focus and quality. Today, their production and warehouses are located in Hagen, Germany. Schake has six models of plastic delineator panels. The plastic delineator panel models with a continuous aluminium support tube inside are not considered in this research. Schake's model type (60W) 60x60 mm has a top and bottom connection so it can be mounted to the stand both ways around ('reversible model'). Model 'type 40' is exactly the same as 'type 60', but the bottom connection on 'type 40' is 40x40mm and in the model 'type 60' it is 60x60mm. (Appendix 1) (Website of the Schake Gmbh 2016.)

Müba GmbH

Müba is one of the most popular manufacturers in the market, especially in Germany. The company was created in 1960 by Willi Mueller and Siegmar Baum. The company is based in Germany and they have over 250 employees. The company is manufacturing construction equipment and scaffolding. The company advertises their strengths to be high quality standards, solid price strategy, professional customer advisory service and continuous development. Müba offers two plastic delineator models. Model 'type one' is with the supporting plastic tube inside. It has to be noted that Müba does not seem to have a product model with 40x40mm bottom connection. (Appendix 1) (Website of the Müba Gmbh 2020.)

Klemmfix GmbH (Horizont group GmbH)

Klemmfix is a German company that was founded by Heinz Mueller in 1945. The business started with electric fencing equipment and later the company specialized in the road safety industry. The company has been in the road safety industry for nearly 40 years. In 2000 the Horizont group acquired and merged with Klemmfix GmbH. The combining of these two companies offered an advantage by bringing two businesses together with complementary product ranges and product families. (Website of the Horizont group GmbH.) Turnover of the Horizont group is around $75 million (Website of the Manageo 2020). Today, the company has over 50 patents and designs and is recognized worldwide for its reputation as one of the leaders in the industry. The headquarters of the company are located in Korbach, Germany. Klemmfix has four model types of plastic delineator panels. It should be noted that Klemmfix does not have models with 40x40mm bottom connection. (Appendix 1) (Website of the Horizont group GmbH.)

Adolf Nissen Elektrobau GmbH + Co. KG

The company was founded by Adolf Nissen in the middle of the 1950s when the company entered to the traffic management industry. The breakthrough of the company came with the development of the first electric warning lamp. (Website of the Adolf Nissen Elektrobau GmbH 2020.) Turnover of Nissen is around $26 million (Website of the Manageo 2020). Today, Nissen has branches in Germany, England, Switzerland, Poland, Spain, Austria and Belgium. The company NissenPlast is also part of the Nissen group. NissenPlast produces plastic parts for road safety, and also

the steel elements are produced by their own production facility. Nissen has five types of plastic delineator panels, but only two of them are without aluminium tube inside. All the models Nissen has with 40x40mm bottom connection has supporting aluminium tube inside. (Appendix 1) (Website of the Adolf Nissen Elektrobau GmbH 2020.)

Traffimex SA

The company is located in Belgium and they have 29 employees. The turnover of the company was not found. Traffimex is the most popular brand in Belgium. Traffimex offers two models of plastic delineator panels, but they offer the option to choose with or without steel tube inside and between 40x40mm and 60x60mm bottom connection (Appendix 1) (Website of the Traffimex SA 2020.)

Beilharz GmbH & Co. KG

The company is based in Germany and was established in 1938 by John Beilharz. After the 1950's the company entered into the industry of highway maintenance. Beilharz is mentioned to stand for high-quality steel, wood and plastic products for over 75 years. (Website of the Beilharz GmbH & Co. KG 2020.) Turnover of the company is nearly $15 million (Website of the Manageo 2020). Beilharz has six types of plastic delineator panels. Two models of the plastic delineator panels are with rotary adapter connecting system (Appendix 1). (Website of the Beilharz GmbH & Co. KG 2020.)

Kwazar Corporation Sp. z o.o.

Kwazar is one of the leading manufacturers and plastic processors in Poland. The company offers various plastic products for different industries, for example garden sprayers and road guidance equipment. Kwazar's products are distributed today to about 100 countries globally. (Website of the Kwazar Corporation Sp. z o.o. 2020.) Turnover of the company is $13.8 million (Website of the Manageo 2020). The company has subsidiaries in Russia and in the UK. Kwazar offers only one type of plastic delineator panel, which has 60x60mm bottom connection and a top connection for a lamp (Appendix 1). (Website of the Kwazar Corporation Sp. z o.o. 2020.)

Val Plastika d.o.o.

The company is located in Slovenia and been in the industry for 50 years. The main business of the company is to manufacture road safety products. Their main products are delineators, snow poles, marking poles and other equipment for enhanced road functionality and visibility. (Website of the Val Plastika d.o.o. 2020.) Turnover of the company is approximately $1.9 million (Website of the Manageo 2020). The company mentions that their products are CE certificated, and that they have machines for plastic blow molding, extruding and an entirely automized line for product blowing. Val Plastika's products are represented in Slovenia, Germany, Austria, Switzerland, Macedonia, Serbia and Hungary. Val Plastika has two models of plastic delineator panels. Val Plastika does not offer delineator panels with dimension of 40x40mm bottom connection or with a supporting steel tube inside. (Appendix 1) (Website of the Val Plastika d.o.o. 2020.)

UAB Vaivora Ir Ko

The company is located in Kaunas, Lithuania. It is the only Lithuanian company that produces plastic road warning signs. The company also produces rubber products. The company has been in the industry for over 15 years. (Website of the UAB Vaivora Ir Ko.) Turnover of the company is $1.5 million (Website of the Manageo 2020). Vaivora Ir Ko is manufacturing two plastic delineator panel models (Appendix 1). (Website of the UAB Vaivora Ir Ko.)

| Company | Country | Turnover (M $) | Model amount | 40x40mm connection | 60x60mm connection | Support tube option |
|---|---|---|---|---|---|---|
| WEMAS | Germany | $59 | 6 | Yes | Yes | Yes |
| Schake | Germany | $75 | 6 | Yes | Yes | Yes |
| Müba | Germany | n/a | 2 | Yes | Yes | Yes |
| Nissen | Germany | $26 | 5 | Yes | Yes | Yes |
| Traffimex | Belgium | n/a | 2 | Yes | Yes | Yes |
| Beilharz | Germany | $15 | 6 | Yes | Yes | Yes |
| Kwazar | Poland | $13.9 | 1 | No | Yes | No |
| Val Plastika | Slovenia | $1.9 | 2 | No | Yes | No |
| Vaivora Ir Ko | Lithuania | $1.5 | 1 | No | Yes | No |

Table 1. Overall information about the competitor companies and products

From Table 1, it may be noticed that most of the companies in the industry are located in Germany. They tend to have multiple models of plastic delineator panels, and they have the option for 40x40mm and 60x60mm bottom connection and for the supporting tube inside. Only Müba makes just two product models among the largest manufacturers. The smaller companies like Traffimex, Val Plastika and Vaivora Ir Ko and Kwazar have only one or two product models in comparison to the market leaders who tend to have five or six models of the plastic delineator panel for different purposes. It can be stated that all the companies listed have model with 60x60mm bottom connection but not all the companies have model with 40x40mm dimension of bottom connection. It can be seen as a conclusion, that the 60x60mm model is more commonly preferred than the model of 40x40mm among the listed manufacturers.

## 8.2 SWOT Analysis of the Company

This SWOT analysis evaluates strengths, weaknesses, opportunities, and threats of the case company when entering to the European Union market area with the new product, plastic delineator panel.

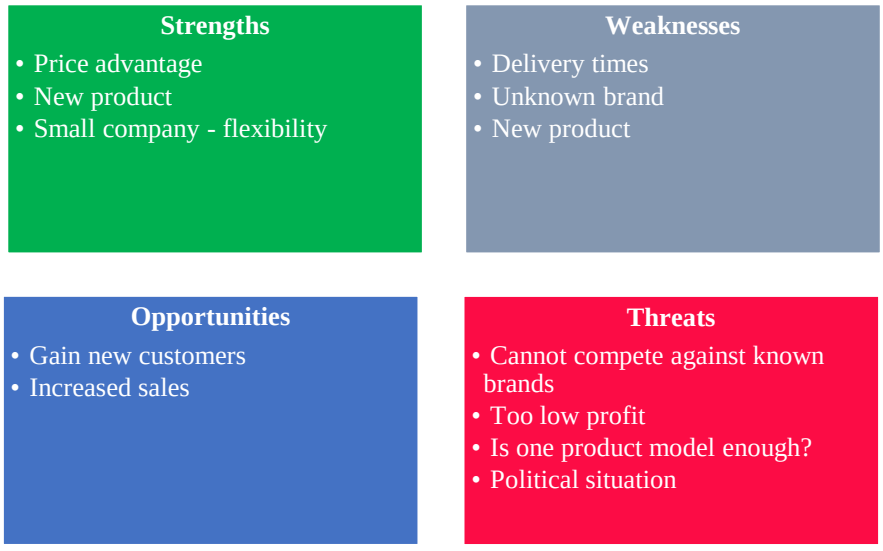


Figure 4. SWOT analysis of the company

**Strengths** – The product is new, so it can be attractive for some companies (e.g. retailers or wholesalers) to have something new in their product range. Also, the product might have some new features that raise its value to the customers. Assuming

manufacturing costs can be lower than in Europe, the product will be cheaper than the competitors' products. Because the case company is relatively small compared to the other companies in the industry, they have flexibility to customize the product according to the customers' needs and preferences.

**Weaknesses** – China is far from Europe, so the delivery times may be longer than from the competitor manufacturers that are located in Europe. Also, because the company is entering into a bit of a new market niche (plastic construction signs), the prospect clients might be skeptical about the quality of the new product.

**Opportunities** – New products might attract new clients that may be interested in the other products of the company which leads to increased sales.

**Threats** – The existing manufacturers of this product might have good reputations in the market which is hard to compete against. Competitors' prices and manufacturing costs might be lower than expected because of the advanced manufacturing technology and some factories might be located in Baltic countries or in Poland which has low manufacturing costs as well. Also, the political situation and the relationship between China and Europe might change because of the coronavirus. The atmosphere in Europe might not be in favor to do business with companies that are located in China. It may be a threat that the company is planning to create only one product model, because nearly every other manufacturer (competitor) has several plastic delineator panel models with different dimensions and features.

# 9 CONCLUSION

The objective of this thesis was to do marketing research of the plastic delineator panel models in the European Union market. The goal in the end was to come up with a proposition for the case company about the product to be manufactured to the European Union market area. The research successfully reached its objective and answered the main research problem: "What type of plastic delineator panel should the

case company start to manufacture to the European Union market area?" and answered the subproblems: "Which companies are the biggest competitors?", "What measures and features should the product have?" and "What are the most used models and brands in Europe?". The goal to have a proposition for the case company about the product was successfully met. In the theoretical part, the concept of value chain was discussed to make the reader conscious about the importance of the fact that on every activity of the value chain there is something that can be done better than competitors in order to gain international competitive advantage such as on product research activity like this. The theories of SWOT analysis and five forces analysis were used to analyze the case company's situation when launching the new product to the market, and to hand insight to the reader about the state of the industry.

The chosen research method, secondary research, was well suited for the objective of the research. The competitors' webpages presented information about the products that were beneficial to reach the objective of the thesis. As a result of the web-based research, 75 keywords about the product and 536 companies of either retailers or manufacturers of plastic delineator panel were listed to the Excel file. The case company will later use this conducted Excel file in marketing after the launch of the product, because it contains a large database of potential buyers of this new product. The pictures of the products separated by different manufacturers can be used as a tool to recognize from whom the prospect client buys from, and this is beneficial in order to gain an understanding of the market segment. When the current manufacturer of a prospect clients' plastic delineator is distinguished, it can be used as an advantage if the selling price of the manufacturer is known, because then a more attractive offer with lower price can be given. This leads to the point that is a bit unfortunate - the prices of the competitors were not public information and therefore not included in this study.

It would be interesting if this research were to be continued further and the research problems were developed. The next phase would be to find out what type of plastic delineator panel is the most used in each country in the European Union market area, and also to do qualitative research by interviewing companies who are using this product to learn about their product preferences. It may be argued that in this study a different type of research method could have been also used. For example, a primary

research method such as qualitative research could have been used to obtain information about the product preferences and to answer to the main research problem by interviewing companies who are familiar with the product. This method was not chosen because the main purpose was to gain knowledge about the competitors' products and by interviewing and conducting customers' preferences, the results may not have been comprehensive enough and securing enough for companies that are willing to participate in interview may be difficult.

The challenging part besides the research process was the theoretical part. From the beginning, the research method and the need for this type of product and competitor research was clear and in accordance with the requirements of the case company but the aspects to be covered in the theoretical part were lacking. The whole process of writing this thesis was quite exhausting and took a lot of time and effort even though I finished it in a short schedule, it kept me busy every day from the morning till the evening. I must say that I am quite happy with the result. Working on this thesis taught me the most about product research, research methods, competitor analysis and value chain. The most valuable aspect for me was that I learned how to conduct this type of product research. Doing this thesis taught me various things that I believe to be useful in the future and in the workplace.

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## Competitors' products

**Wemas:**

Model: LEITBAKE TYP 60 EXPORT
Weight: 2.85kg
Size: 1300mm x 290mm x 60mm
Bottom connection: 60mm x 60mm
Top: ø42mm connection for lamp
(Website of the WEMAS Absperrtechnik GmbH 2020)

Picture 1. WEMAS LEITBAKE TYP 60 EXPORT

Model: LEITBAKE TYP 40 EXPORT
Weight: 3.4kg
Size: 1300mm x 250mm x 50mm
Bottom connection: 40mm x 40mm
Top connection: not written
(Website of the WEMAS Absperrtechnik GmbH 2020)

Picture 2. WEMAS LEITBAKE TYP 40 EXPORT

**Schake:**

Model: Plastic traffic panel type 60
Weight: 2kg
Size: 1260 mm x 300 mm
Bottom connection: 60 mm x60 mm
Top connection: top socket Ø 42mm
(Website of the Schake Gmbh. 2016)

Picture 3. Schake Plastic traffic panel type 60

Model: Plastic traffic panel type 60W

Weight: 2kg

Size: 1260mm x 300mm

Bottom connection: 60mm x 60mm

Top connection: 60mm x 60mm

(Website of the Schake Gmbh 2016)

Picture 4. Schake Plastic traffic panel type 60W

**Müba:**

Model: Type One

Weight: 2kg

Size: 1250 mm x 300 mm x 7 mm

Bottom connection: 60 mm x 60 mm

Top connection: Not written

(Website of the Müba Gmbh 2020)

Picture 5. Müba Type One

Model: Type Two

Weight: 2kg

Size: 1320 mm x 290 mm x 7 mm

Bottom connection: 60 mm x 60 mm

Top connection: Ø 42mm

(Website of the Müba Gmbh 2020)

Picture 6. Müba Type Two

**Klemmfix:**

Model: Standard delineator R605

Weight: 2.3kg

Size: 1225mm x 300 mm

Bottom connection: 60 x 60 mm

Top connection: Ø 42mm

(Website of the Horizont group GmbH)

Picture 7. Klemmfix Standard delineator R605

Model: Standard delineator D605S and D605SS

Weight: 3.5kg

Size: 1225mm x 300 mm

Bottom connection: Klemmfix twist and plug system

Top connection: Klemmfix twist and plug system

(Website of the Horizont group Gmbh)

Picture 8. Klemmfix Standard delineator D605S and D605SS

Model: Plug and twist, reversible delineator

Weight: 4.15kg

Size: 1280mm x 300 mm

Bottom connection: Klemmfix twist and plug system

Top connection: Klemmfix twist and plug system

(Website of the Horizont group GmbH)

Picture 9. Klemmfix Plug and twist, reversible delineator

Model: Reversible delineator 60/60

Weight: 2.3kg

Size: 1225mm x 300 mm

Bottom connection: 60 x 60 mm

Top connection: 60 x 60 mm

(Website of the Horizont group GmbH)

Picture 10. Klemmfix Reversible delineator 60/60

**Nissen:**

Model: Wendebake WeBani 60

Weight: 2.6kg

Size: 1415mm x 287 mm x 60 mm

Bottom connection: 60 x 60 mm

Top connection: 60 x 60 mm

(Website of the Adolf Nissen Elektrobau GmbH)

Picture 11. Nissen Wendebake WeBani 60

Model: Standard-leitbake

Weight: 2.6kg

Size: 1335mm x 287mm x 60 mm

Bottom connection: 60 x 60 mm

Top connection: No information available

(Website of the Adolf Nissen Elektrobau GmbH)

Picture 12. Nissen Standard-leitbake

**Traffimex:**

Model: Balises type 1 Belgique
Weight: Not written
Size: Not written
Bottom connection: 40 mm x 40 mm or 60 x 60 mm
Top connection: Not written
Extra information: In accordance with
Belgian Highway Code (AM 7 mei 1999)
(Website of the Traffimex SA 2020)

Picture 13. Traffimex Balises type 1 Belgique

Model: Balises type 2 Belgique & Europe
Weight: Not written
Size: Not written
Bottom connection: 40 mm x 40 mm and 60 x 60 mm
Top connection: Not written
(Website of the Traffimex SA 2020)

Picture 14. Balises type 2 Belgique & Europe

**Beilharz:**

Model: TL-Safety-Reversible-Beacon with rotary system
Weight: 2.3kg
Size: 1350 mm x 300 mm
Bottom connection: rotary adapter connecting system
Top connection: 40 x 40 mm
(Website of the Beilharz GmbH & Co. KG)

Picture 15. Beilharz TL-Safety-Reversible-Beacon with rotatory system

Model: TL-Safety-Standard-Beacon with rotary system

Weight: not written

Size: 1310 mm x 300 mm

Bottom connection: 60 x 60 mm

Top connection 60 x 60 mm

(Website of the Beilharz GmbH & Co. KG 2020)

Figure 16. Beilharz TL-Safety-Standard-Beacon with rotary system

Model: Standard-Beacon type 60 and type 40

Weight: 2.3kg

Size: 1220 mm x 300mm

Bottom connection: 60 x 60 mm or 40 x 40 mm

Top connection: 40 x 40 mm

(Website of the Beilharz GmbH & Co. KG 2020)

Picture 17. Beilharz Standard-Beacon type 60 and type 40

Model: Reversible-Beacon type 60 and type 40

Weight: 2.3 Kg

Size: 1280 x 300 mm

Bottom connection: 60 x 60 mm or 40 x 40 mm

Top connection: 60 x 60 mm or 40 x 40mm

Top connection has to be same size with bottom part.

(Website of the Beilharz GmbH & Co. KG 2020)

Picture 18. Beilharz Reversible-Beacon type 60 and type 40

**Kwazar:**

Model: U-21 road edge delineator

Weight: 2.67kg

Size: height 1245mm

Bottom connection: 60mm x 60 mm

Top connection: n/a

(Website of the Kwazar

Corporation Sp. z o.o. 2020)

Picture 19. Kwazar U-21 road edge delineator

**Val Plastika:**

Model: Standard Delineator Board T-60-D45

Weight: 2.5 Kg

Size: Not written

Bottom connection: 60mm x 60 mm

Top connection: Ø 45 mm

(Website of the Val Plastika d.o.o. 2020)

Picture 20. Val Plastika Standard Delineator Board T-60-D45

Model: Reversible Delineator Board T-60-60

Weight: 2.5 Kg

Size: Not written

Bottom connection: 60 x 60 mm or 40 x 40 mm

Top connection: 60 x 60 mm or 40 x 40mm

(Website of the Val Plastika d.o.o. 2020)

Picture 21. Reversible Delineator Board T-60-60

**Vaivora Ir Ko**

Model: Type 1

Weight: not written

Size: not written

Bottom connection: 60 x 60 mm

Top connection: not written

(Website of the Vaivora Ir Ko)

Picture 22.
Vaivora Ir Ko
Type 1

Model: Type 2

Weight: not written

Size: 1350 mm x 290 mm

Bottom connection: 60 x 60 mm

Top connection:

(Website of the Vaivora Ir Ko)

Figure 22.
Vaivora Ir Ko
Type 2

APPENDIX 2

# Examples of the conducted excel file.

| N° | Company | URL | Name | Base and top | Film and body size | Weight | Price | Comments | Turnover | Picture |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Wemas | https://www.wemas.de/de/shop/product/21729/Leitbaken/leitbake-typ-60-export/ | 60 Export | 60 x 60mm<br>Top: ø42mm | Body size: 1300 x 290 MM<br>Film size: 1300 x 290 x 60 MM | 2.85 Kg | 35.00 € | HDPE | $32 Million |  |
| | | https://www.wemas.de/de/shop/product/21733/Leitbaken/leitbake-typ-40-export/ | 40 Export | 40 x 40 | Body size: 1300 x 250 x 50 MM<br>Film size: 1000 x 245mm | 3.4 Kg | 38.41 € | HDPE | |  |
| | | https://nissen- | | | | | | | |  |

... Germany | Austria | Netherlands | France | Poland | Belgium | Denmark | Estonia | Latvia | Lithuania | Slovenia ...

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Schake<br><br>Team page: https://www.schake-gmbh.de/en/kontakt/personal-contact-partners.html | https://www.schake-gmbh.de/en/building-equipment/road-construction/traffic-panel/36055.html | Type 60 | 60 x 60<br>Top: ø42mm | Body size: 1260 x 300 MM<br>Film size: 1000 x 250mm | 2.4 Kg (no steel) | | HDPE | $36.2 Millior |  |  |
| | | https://www.schake-gmbh.de/en/building-equipment/road-construction/traffic-panel/36045.html | Type 40 | 40 x 40<br>Top: ø42mm | | | | | |  | |

| N° | Company | Link | Name | Base and top | Ilm and body siz | Weight | Price | Comments | Turnover | Picture |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **VBTraffic** | https://www.vbtraffic.com/produkty-bezpieczenstwa-ruchulpachol ki-i-slupki-drogowe/tabli ca-kierujaca-u-21-typ-1/<br><br>https://sklepznagar.pl/urzadzenia- | Traffimex | 40 x 40<br>Top: 42 mm | Body size: 1100 x 300 x 50mm | 3.7 Kg (including steel) | | PP<br><br>one side with a 40 x 40 pin for mounting in the base, and on the other with a ø 50 pin to mount a road lamp on it. | $1.9 Million |  |
| 2 | **Kwazar**<br><br>**Team page: https://kwazar.com.pl/contact** | https://kwazar.com.pl/en/produkty-drogowe/ogranicznik-skrajni-drogi-u-21 | Kwazar | | Height 1245 MM | 2.67 Kg | | Manufacturer | $13.8 Million |  |
| 3 | **PZM Wimet** | http://www.pzmwimet.pl/ | PZM Wimet | | | | | | 4.8 Million (https://www.pb.pl/gazele/gazela/24490) |  |
| 4 | | http://sklep24.pzmwimet.pl/cat,56_Urz%C4%85dzenia_BRD_Ograniczniki_s | Picture of Traffimex but manufacturer | 60 x 60 | Body size: 1245 x 300 MM | 2.7 Kg | | | |  |

... | Germany | Austria | Netherlands | France | **Poland** | Belgium | Denmark | Estonia | Latvia | Lithuania

| Company | Link | Name | Base and top | Ilm and body siz | Weight | Price | Comments | Turnover | Picture |
|---|---|---|---|---|---|---|---|---|---|
| **BUKO infrasupport** | https://infrasupport.buko.nl/producten/geleidebakens | BUKO | | | | | | $122 Million |  |
| **Verkeesborden** | https://www.verkeersborden.com/geleideb aak-baakschild-met-pijp-10x | LC Model<br>Brand: Trip | 60 x 60 | Body size: 1370 x 295 MM<br>Film size: 1000 x 250 MM | 3.42 Kg | 42 | With plastic pipe.<br><br>PVC-plastic pipe with a diameter of 40 mm. This internal tube is located over the entire height or length of the guide beacon. Thanks to this pipe, this beacon shield is extremely robust. The beacon therefore feels a lot more solid. | $4.5 Million |  |
| | https://www.verkeersborden.com/geleideb aken-kx | KX Model | 60 x 60 x 95 | Body size: 1310 x 310 MM<br>Film size: 1000 x 250mm | 2.54 Kg | 37 | Equipped with 2 x base 60 x 60 mm, height base: 95 mm | |  |

... | Germany | Austria | **Netherlands** | France | Poland | Belgium | Denmark | Estonia | Latvia | Lithuania | Slo