

Lappeenranta-Lahti University of Technology LUT

School of Business and Management

Supply Management

Kamila Ravzieva

Conceptual Approach for Supplier Management – Case Edutainment

Supervisor/Examiner: Veli Matti Virolainen

Examiner: D.Sc. Sirpa Multaharju

Abstract

| |
|---|
| Author: Kamila Ravzieva |
| Title: Conceptual Approach for Supplier Management – Case Edutainment |
| Faculty: School of Business and Management |
| Major: Supply Management |
| Year: 2019 |
| Place: |
| Master's Thesis. Lappeenranta-Lahti University of Technology LUT 95 pages, 14 tables, 22 figures and 2 appendices Examiners: Professor Veli Matti Virolainen, D.Sc. Sirpa Multaharju |
| Keywords: supplier segmentation, supplier management, supplier development, buyer–supplier relationships, purchasing portfolio matrix |
| <p>The aim of this paper is to develop a new framework to supplier segmentation that fits the purpose of case company and considers company's needs. Developed approach should become purchasers' instrument to organize and monitor suppliers' pool based on required suppliers' characteristics. Moreover, a new approach could be used in supplier development decisions.</p> <p>The framework is developed by using existing literature. The most known studies relate to supplier allocation approach were explored and critically analyzed. Based on previous theoretical studies suitable segmentation framework is proposed and evaluation criteria are provided.</p> <p>Research is based on qualitative methodology. Empirical data given by the case company was gathered by interviews, questionnaires and cross-functional workshops. Based on literature review, empirical data and cross-functional workshops a new supplier segmentation approach was suggested. The segmentation framework contain combination of two approaches: traditional Portfolio matrix with two dimensions: profitability and supply risk and the latest concept of two criteria suppliers' capabilities and willingness. Thesis provide step-by-step implementation instruction for case company.</p> |

Content

| | | |
|--------|--|----|
| 1. | Introduction..... | 8 |
| 1.1. | Purpose of the study | 8 |
| 1.2. | Scope and Goals..... | 9 |
| 1.3. | Research questions | 10 |
| 1.4. | Research methodology and structure..... | 10 |
| 2. | Current situation analysis..... | 13 |
| 2.1. | Edutainment and Family parks Moscow market analysis..... | 13 |
| 2.1.1 | Market overview..... | 13 |
| 2.1.2. | Competitors analysis..... | 16 |
| 2.1.3. | Industry Threats & Opportunities..... | 19 |
| 2.1.4. | Success factors on the market | 20 |
| 2.2. | Case company background..... | 21 |
| 2.2.1. | Company overview | 21 |
| 2.2.2. | Company organization structure..... | 23 |
| 2.2.3. | Company Supply Chain | 26 |
| 2.2.4. | Supply function challenges | 27 |
| 3. | Supply Management in Literature | 29 |
| 3.1. | Purchasing | 30 |
| 3.2. | Purchasing Strategy | 31 |
| 3.2.1. | Process of developing purchasing strategy | 36 |
| 3.3. | Supplier selecting..... | 37 |
| 3.3.1. | Sourcing strategy | 37 |
| 3.3.2. | Identifying criteria for supplier evaluation | 38 |
| 3.4. | Supplier Segmentation | 44 |
| 3.4.1. | Classification criteria | 45 |
| 3.4.2. | Segmentation Model | 49 |
| 3.5. | Supplier Management and Development | 54 |
| 3.5.1. | Supplier relations strategies | 56 |
| 3.5.2. | Factors of successful implementing supplier development strategy | 58 |
| 3.5.3. | Supplier Development Strategies..... | 61 |
| 4. | Developing segmentation framework for case company | 65 |
| 4.1. | Background information about case company..... | 66 |

| | |
|---|----|
| 4.2. Purchasing portfolio analysis | 68 |
| 4.3. Current supply base analysis | 70 |
| 4.4. Segmantation framework | 72 |
| 4.5. Identifying supplier segmentaion criteria | 73 |
| 4.6. Criteria evaluation and agregation phase..... | 74 |
| 4.7. Developing supplier relationship management approach | 83 |
| 4.8. Implementation | 87 |
| 5. Conclusion..... | 90 |
| 6. Summary | 92 |
| Appendix 1 | 93 |
| Appendix 2 | 95 |
| References..... | 96 |

List of Figures

Figure 1. Thesis structure

Figure 2. Market growth rate, percent

Figure 3. Moscow permanent population from 2012 to 2017

Figure 4. Market share

Figure 5. KidZania Parks locations

Figure 6. Organization Structure

Figure 7. Company current supply chain

Figure 8. General Supply Chain

Figure 8. Benefits from using different governance structure

Figure 9. Four levels of Strategy development process

Figure 10. Kraljic's portfolio matrix

Figure 11. Four segment model

Figure 12. Three segment Model

Figure 13. Sourcing options

Figure 14. Benefits from using different governance structure

Figure 15. Segmentation framework development stages

Figure 16. Case company purchasing types

Figure 17. Case company material portfolio matrix

Figure 18. Combined PPM-SPM approach

Figure 19. Industrial design suppliers' allocation according PPM model

Figure 20. Industrial design suppliers' allocation according SPM model

Figure 21. Industrial design suppliers' segmentation combined PPM-SPM model

Figure 22. Implementation steps

List of Tables

Table 1. Comparative matrix of competitors

Table 3. Criteria according to their popularity in selected literature reviews

Table 4. Supply classification criteria

Table 5. The approaches and methods to supplier segmentation

Table 6. Success factors of Supplier development and supplier performance

Table 7. Suppliers regular number of orders

Table 8. Selected criteria

Table 9. Purchasing portfolio Supply risk dimension criteria evaluating results

Table 10. Purchasing portfolio Profit impact dimension criteria evaluating results

Table 12. Capabilities and willingness criteria weights

Table 13. PPM grades calculation

Table 14. Combined model calculation

List of Abbreviations

| | |
|-----|----------------------------------|
| SCM | Supply Chain Management |
| SRM | Supplier Relationship Management |
| PPM | Portfolio Purchase Management |
| SPM | Supply Purchase Management |
| DM | Decision Makers |

1. Introduction

Supply chain issues have emerged as a major concern for both practitioners and researchers, especially nowadays, due to an uncertain and flexible business environment. Market giants from different industries have announced their Supply Chain strategies, and the importance of focusing on supply chain issues closely as well as developing a strategy and an optimal supply system is vital for both small- and medium-size companies.

The purchasing function of a company has become extremely important due to an ongoing process of getting the business more competitive. Procurement to sales ratios are generally falling within the range of 30%-60% for service provider companies, within 50%-70% for manufacturing companies, and within 80%-95% for retailers – and many organizations are seeing a further rise in this percentage (Van Weele, 2010). In addition, Supplier Relationship Management (SRM) concepts are receiving more and more attention and focus from researchers in literature.

1.1. Purpose of the study

The purpose of this study is to develop an organized purchasing process and to rationalize the current supplier base in the case company in terms of medium value purchases. For companies, especially for small ones, it is common that the processes, counteragents, and procedures are historically formed, and the middle management accepts them just as they are without questioning. As a result, this concept leads to inefficient operation and company performance. The case company has started its operations and entered the Russian market in 2016, so there has not been enough attention to the supply function itself. There is no confirmed procedures and stable business processes, and current supplier base is unorganized. All the suppliers and purchases are generally considered as equal while the amount, the type of products and prices are different.

There are no formalized business processes and there is a lack of historical data about the suppliers since all the information has been concentrated around one

person who is involved in the sourcing processes, and there has been no need in sharing it. The relations with suppliers are quite distant because the purchasing function, in general, is transactional in the company. As a consequence, there are no evaluation processes and no available data of suppliers' performance.

The continuing growth of the number of purchasing items and the variation of these items leads to the necessity of rationalizing and developing a general purchasing process. Moreover, it should help the company to improve the efficiency in sourcing, make it easier to share the knowledge with new purchasers and stabilize the process. Since purchasing items and their value are different, the sourcing and supply relations strategies should be appropriate and corresponding. The purpose of this study is to develop a model and a framework that would allow the case company to work with different suppliers accordingly, evaluate their performance and compare them.

1.2. Scope and Goals

The research is based on the case study of an international company operating in 24 countries, which has entered the Russian market in January 2016. The focus is the Supply Chain department, which consist of sourcing and inventory management functions. The scope covers an end-to-end purchasing process of the case company starting at selecting the suppliers and continuing up to the actual delivery and installation if needed. The data and background information for this thesis was gathered through interviews and exploration of documents related to the purchasing process. In addition, some workshops with different functions as well as several interviews with the company management were conducted in order to get a full view of certain business processes of the enterprise.

As the company is small, and so is the volume of purchasing, it is challenging to find a straight answer by comparing it to big industrial players, and that was the main trigger for this study. The goal of the project is to find out how to manage suppliers and different types of purchases successfully. This target could be reached through assessing the current situation in the company (the logistics network, the procurement process, the organizational structure of the company) and by taking into

consideration current theoretical findings from literature. This approach will help to create recommendations for the case company.

1.3. Research questions

The research problem of the study can be formulated from its goal. The aim of the study is to create a conceptual approach to Supplier Management. The focus of the research is supplier relationship management: supplier selection, segmentation, creation of supplier management strategy model. The research is based on a case study, but some components of the study could be used and are applicable to other businesses as well.

This thesis paper will have a general discussion on supply strategy, supplier and purchasing management, particularities of small and medium purchases, and whether suppliers should be managed equally.

All the points mentioned above result in the following research questions:

RQ1. How to develop Supplier Management strategies?

RQ2. What is the efficient supplier management framework for the case company?

RQ3. How should the suppliers of the case company with different characteristics and purchased items be managed?

1.4. Research methodology and structure

The thesis consists of five main parts. It starts with an introduction where, firstly, the idea and the purpose of the study are identified. A high-level overview on the case company situation is given to explain the reason why the study has been initiated at first place. After that the scope and the goal are discussed to identify the desired outcome and research limitations. After the goal of the master's thesis is formulated, it is broken into research questions, which should be answered.

The second part of the study is market analysis. This part will help to understand external and internal environment of the case company. First part will be devoted to Edutainment Market in Moscow, which the case company is part of. The volume of the market, its potential and main challenges as well as success factors will be discovered, and the competitors will be thoroughly analyzed. After that, the internal situation in the company will be explored to define the core problems and to get a big picture. In addition, financial situation, organizational structure and supply chain function will be discussed. The information to conduct the company's current situation analysis was gathered through cross-functional workshops and interviews with the CEO, financial director and the lead of Supply Chain department to gain strategic and sourcing perspective. This part of the study allows to get all the relevant insights and get different perspectives that will help to develop recommendations applicable to the case company.

After the company's current state analysis theoretical chapters will follow. The relevant literature will be discovered to find solutions and concepts that correspond with problems. Based on the theory review, the appropriate methods will be chosen to redevelopment. This part of the thesis is divided into 3 subchapters in which procurement strategies, supplier selection and evaluation, purchasing processes will be discussed. Procurement strategy will be considered at high level, types and factors will be defined. Next chapter is about supplier management: classification, evaluation criteria, selection methods and relations strategies. Purchasing process chapter will discuss factors which are affecting the process. The structure of the study is presented in Figure 1.



Figure 1. Thesis structure

In the third chapter, the empirical part will deep dive into the supply function of the case company. A detailed analysis of current processes will be conducted. This will be followed by the supplier segmentation framework, which is going to be introduced with all the parameters and definitions. Consequently, the road map of each segment and vital business processes will be provided. At the end of the chapter the estimation of the possible economic effect of the recommendations will be defined.

The last chapter will sum up the research and will provide answers to the research questions and research gaps. In addition, the potential of future research related to the study will be discussed.

2. Current situation analysis

In the following paragraph, we are going to analyze the case company and the external environment to identify main problems and potential for improvement and company success. First, it is important to have a look at the company at a glance to understand the current situation of the company position on the global market, and only after that to look deeply into the local company in the chosen market (Russia, Moscow) and identify the main issues in the company which could be a barrier to aim company targets and sustain for the company future sustainable growth. To reach that we should analyse the environment to get the main industry trends, threats and opportunities. The knowledge about competitors allows to identify the market size and the market share, which is essential for developing a strategy. Moreover, it helps to determine the market requirements and key advantages of the company, which should be the core focus for top-management in near future.

2.1. Edutainment and Family parks Moscow market analysis

To understand the real situation in the company, identify the core reasons for company's problems the market analysis is essential. Both internal and external environment analysis are conducted. Firstly, in our market analysis, we look through the market to identify the market size, market growth and industry growth trends to key audience with their requirements and to analyze the rivals. This data lets to determine the key success factors, weakness and threats of case company.

2.1.1 Market overview

We take into consideration Moscow Family Entertainment and Recreational parks market. The research of the Academy of the Industrial Markets Context, the Russian market of amusement parks claims that family entertainment centers are at the initial stage of development. Considering to the international experience of developing the centers for children, the saturation of the children's entertainment market in Russia is estimated at 10-15%. The reserve of growth is 100% even in approximate assessing (Marketing research and analysis of children's leisure time activities: amusement,

game centers, and parks). According to the Russian Association of Parks and Amusement Producers, there are about 600 outdoor amusement parks in the country, and only 30 large ones and 8 reconstructed entertainment family parks. By comparison, in the European market total amount of parks facilities is 1 116 (300 Amusement Parks and Attractions according IAAPA analysis) and 400 in the United States. There are still only a few large amusement parks, but there are some such as Riviera Park in Sochi and St Petersburg's Divo-Island. Family entertainment centers (FECs) are very actively developing. Several new large indoor facilities open each year. Although the amount of entertainment parks is quite big, the quality of the facility and offered service is rather low. Clients' satisfaction of service is by 15-20% lower than in Europe and the US (Russian Association of Amusement Parks & Attractions first-vice president, Igor Rodionov).

The market experts predict expansive growth by five- seven times on the market in coming 2-3 years (Children's entertainment centers in Moscow: market analysis report, by *Academy of Industrial Markets Conjunction*). Last 7 years the market growth steadily keeps on the level of 9-10% (Figure 1). It means that parents are willing to pay to diversify their kids' entertainment and invest in children developing new skills (Sergey Scherbakov – marketing expert in kids' industry, author, Svetlana Knyazeva – CEO BRTG). On the Figure 2 could be indicated slender market falling-off which could be explained by exchanging the rate of volatility in 2016. On the other hand, in Europe the growth rate is only 1-3 % that makes Russian market attractive for local businesses and international investment. The market size is approximately 3,5 billion RUB yearly. Taking into the consideration the climate, demographic statistics, welfare, quality of life, heritage of passed international events the largest tourist centers of Moscow, St Petersburg and Sochi are the most suitable places where this kind of park will work (Russian Gazeta, 2018).

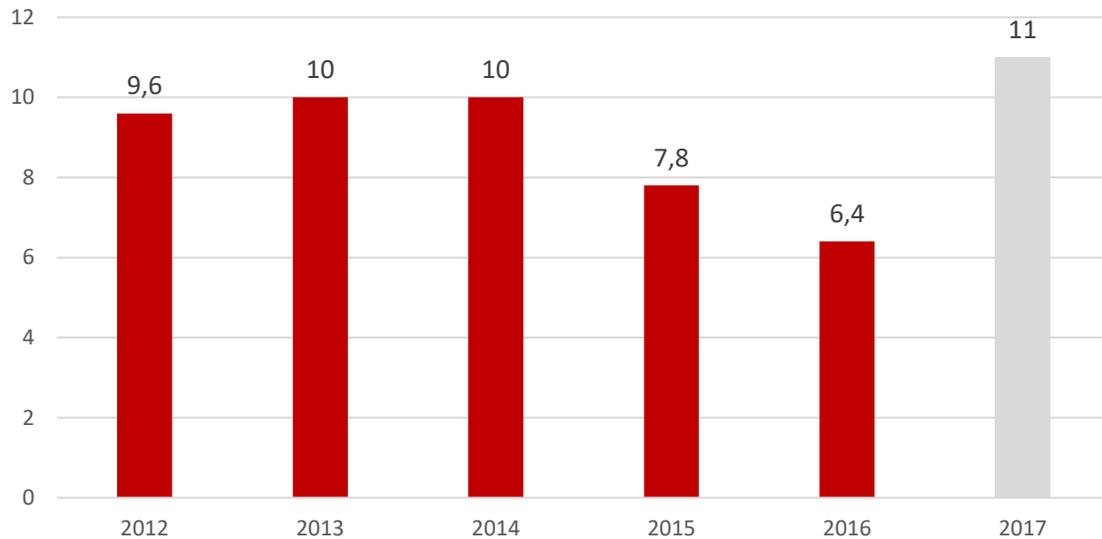


Figure 2. Market growth rate, percent (*Academy of Industrial Markets Conjuncture*)

The other important data for analyzing the market potential is continuous growing of birth rate that could be indicator of the future demand of Family Entertainment Centers (FEC), according to the statistics that given by Russian Federal Service of State Statistics (RFSS) yearly growth of birth in Moscow is 3% (average in 2011-2016). Moscow is the most populous city in Russia (RFSS), 12 400 thousand people live in Moscow (permanent population) plus 7 318 647 people in Moscow region out of 146 544 710 on 1 January 2017 that is 13, 4% growth (RFSS) Figure 3. Females with kids from 4 to 14 are 7,2% of all and 1 847 000 kids from 4 to 14 (target audience of case company KZ Moscow). From overall Russia population 17% are kids from 0 to 14 (RFSS). The level of income in Russia in the past 15 years has grown. The level of well-being adult household population in Russia increased approximately fourfold - from \$ 2,940 in 2000 to \$ 16,770 in 2017 (data from the Global Wealth Report 2017). Moreover, in a very short time, a new middle class has emerged. The other essential parameter is related to the entertainment market growth potential is middle class share, reported Rambler. All explored information allows to enclose the huge potential for the market from the demand perspective.

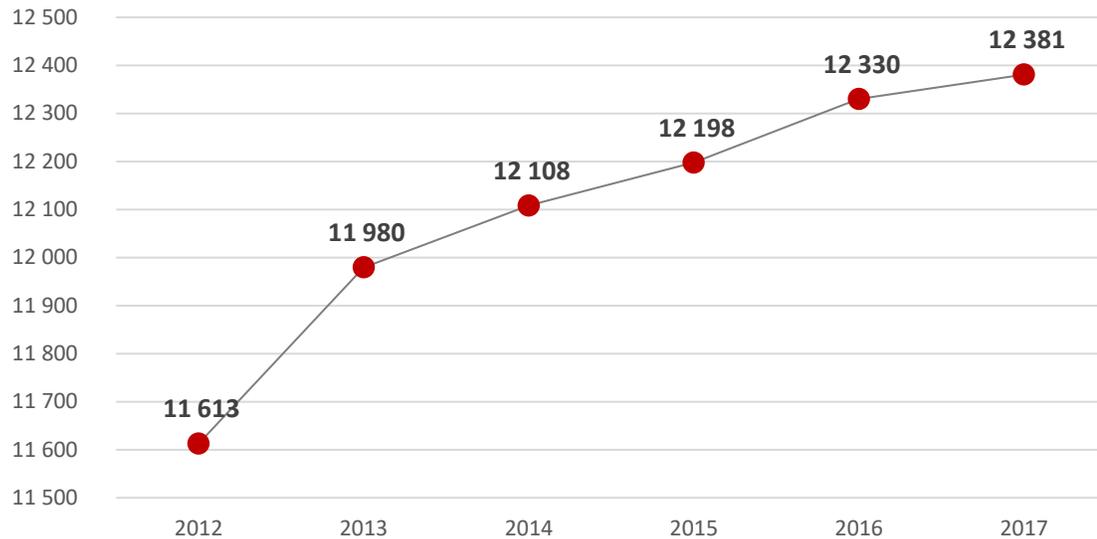


Figure 3. Moscow permanent population from 2012 to 2017 (*Russian Federal Service of State Statistics (RFSS)*)

2.1.2. Competitors analysis

To finalize, the market analysis and identify the trend and clients' requirements it is important to look at case company rivals and market share in the Moscow region. As rivals could be determined the places, which can be alternatives for mothers to go with their child to. In Moscow there're more than 350 museums, 19 zoos, 16 play centers, 40 big play grounds, 70 development and educational centers, 13 circuses, 21 amusement parks. All these organization could be determined as a competitor's landscape. To close in, in the list of competitors it is better to look at target audience and their characteristics.

As the park for children from 4 to 14, the core audience are young mothers from 30 to 39 with kids from 5 to 12, living in Moscow region, active in life and in social media, seeking the best way of family time spending options, needs to be admired by people as good mothers. Family monthly income is RUB 130-150 thousand (EUR 2000+). Therefore, we come up with the list of compactors: Gorky park; Exhibition of Economic Achievements (VDNKh); Children's city of professions "KidBurg"; "Masterslavl" city of professions we focus on similar business models and exploring

Moscow edutainment market members: KidBurg and Masterslavl' as core competitors. The market shares apportion between rivals presented on Figure 3, the shares between the market members are almost identical, however the biggest market share holds case company (41%) then goes Masterslavl park with 34% the Kidburg is less popular but still holds 25%. The reasons why the case company is the lion in the market are successful marketing actions about recent opening; worldwide known brand (franchising); biggest area almost 10 000 m² and quality of the service (conducted interviews).

Kidburg is the chain of parks; the first was open in 2009. Company concept is similar with case company learning through entrainment. They were the first business in new for Russia edutainment industry. Currently 13 projects are launched in Moscow, Rostov-na-Dony and St. Petesburg. The audience are children in age from 1,5 to 14, the average space of the park is 2 000 m² that is five times less than case company. The revenue is approximately 20 mln. RUB.

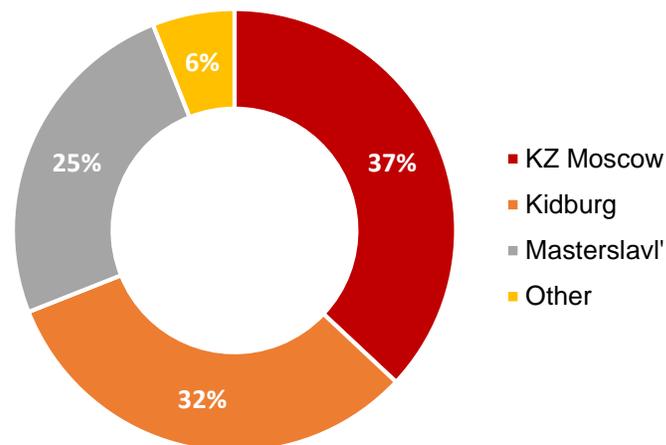


Figure 4. Market share (*Academy of Industrial Markets Conjuncture*)

The city of Masterslavl' in Moscow was the first and the largest family theme park in Russia, where children are acquainted with professions. It is located in the big shopping Mall. It occupies approximately two floors; the area is approximately 6 000 m². The center was opened in 2014. Concept of this park is almost as the same as

with case company, besides the learning through edutainment and trying new professions the park is a commercial and advertising platform for the partners. Partners are the top Russian brands such as bank Sberbank, retailer Azbuka Vkusa, etc.

KidBurg has the best location in the center of Moscow. It is important criteria for the parents especially on the weekdays to visit after the work. But most activities for children at the age from 1,5 to 6, which is under the core audience 4-14. The other disadvantage is the small and stuffy area for maximum 200-300 guests and it doesn't fit well for the big company of up to 10 teenagers looking for fun. The biggest advantage of Masterslavl' is the space and traditional professions and activities. The focus of the company is Russian culture and maintaining Russian traditions. That is a core advantage and difference from KZ Moscow. The comparative matrix according to important for clients' criteria presented on following, with green marker identifying the leader of the criteria. KZ Moscow has acquired 3 out of 5 criteria, and potentially the location could be the advantage as well because of coming opening of the new subway station that is two minutes away from the shopping mall.

Table 1. Comparative matrix of competitors

| | KZ Moscow | Masterslavl' | KidBurg |
|-----------------------|---|---|---|
| Age | 4-14 | 5-15 | 1-14 |
| Space area (m2) | 10 000 | 6 000 | 3 000 |
| Price | Kids – 1200-1500 Adult - 750 | Kids – 1100 Adult - 700 | Kids – 1200 Adult - 400 |
| Number of professions | 100 + | 150 + | 60 |
| Location | Shopping mall 10 minutes by shuttle from subway station | Moscow city near the sab way station | City center Enter directly from the subway station |
| Inclusivity | Fully | Fractional | Fractional |

| | KZ Moscow | Masterslavl' | KidBurg |
|---------------|--|---|--|
| Advantages | Well-known brand, famous partners (brands), historical company experience (international). | Traditional professions, Russian culture and traditions. | Location in the city center. |
| Disadvantages | Expensive food on the park territory. Some of the activities at additional charge. | Tight restrictions; activities; quality equipment interior. | Cramped and stuffy space and crowded and too loud animation. |

The competitors themselves admit the KZ Moscow advantages (big experience; geographical spread; brand; space and high-level quality in service and infrastructure. The overall growth of the attraction industry in Russia experts evaluate by 30% yearly. Market experts emphasize that the edutainment industry will stay a seller's market for minimum 3 years. It means that the demand for the product exceeds supply (number of FECs) (Dmitry Smorodin, CEO "The first general contractor", Kommersant', 2014).

2.1.3. Industry Threats & Opportunities

The Amusement Parks industry has grown strongly over the past five years, driven by a rise in international and domestic visitor numbers and rising consumer spending. Although the industry is not competitive enough comparing to the US and Europe markets. There are no dominants in the industry because of unsaturation in the Russian market yet.

While industry establishments are not well-dispersed throughout Russia at all and the members of the markets concentrated in two-three big cities, there is no opportunity to estimate the allocation of the industry revenue, wages and employment concentration.

IBISWorld identifies 250 Key Success Factors for a business. The most important factors for the Amusement Parks Industry are:

- Access to multiskilled and flexible workforce;
- Proximity to key markets;
- Carrying out all necessary maintenance to keep facilities in good condition;

Experts identify three main threats for the industry:

- **Seasonality** - extreme volatility of the revenue throughout the year
- **Dependence** - many factors driving the industry the main are an expanding economy and travel-related trends
- Large investment and long **pay-off period**

These three factors are putting business at risk. They should be considered by the management at all levels and functions of the company.

2.1.4. Success factors on the market

Based on our research, industry and location specific list of the key successful factors could be identified:

- Easy access (Location)
- Ample and secure parking
- Indoor activities for year-round entertainment
- Providing popular and wide-ranging entertainment activities
- Target high traffic areas for maximum public exposure
- Design facilities to curb overcrowding
- Seasoned management team
- Elaborated marketing plan

The certain risk factors could be minimized by:

- Initial capitalization of the company to sustain operations through year one
- Low overhead using multi-skilled employees and continual training
- Strong customer base through aggressive marketing
- Strong community ties and involvement
- Eliminate collection costs by establishing cash/credit/debit card only facilities

Results of the market analysis give us an understanding of our case company competitor position, the strengths and opportunities make clear the further direction, threats and weaknesses open the required changes. To go deeper in understanding the current company's challenges and formulate a certain question that should be answered by research and limitations, we have to analysis the company itself. Processes, organizational structure, current supply chain department and get insights from internal experts.

2.2. Case company background

In this chapter general information and background of the case company will be discussed. Analysis of company structure and supply function's challenges.

2.2.1. Company overview

In this work, we are going to focus on the KZ Moscow office as a case study. The case company is a worldwide known chain of the family entertainment experiential learning centers currently operating in 24 locations worldwide. It was founded in North America and the first park was opened in 1999 in September. Parks are allowing children to work like adults in the small model of the real city in adult jobs where the participants earn currency and unique educational experiences. It is a place where everyone can be whomever he or she wants and dream to be. Since the first park, opening it has received more than 31 million visitors. Such impressive statistics are making it one of the fastest-growing global edutainment brands in the world.

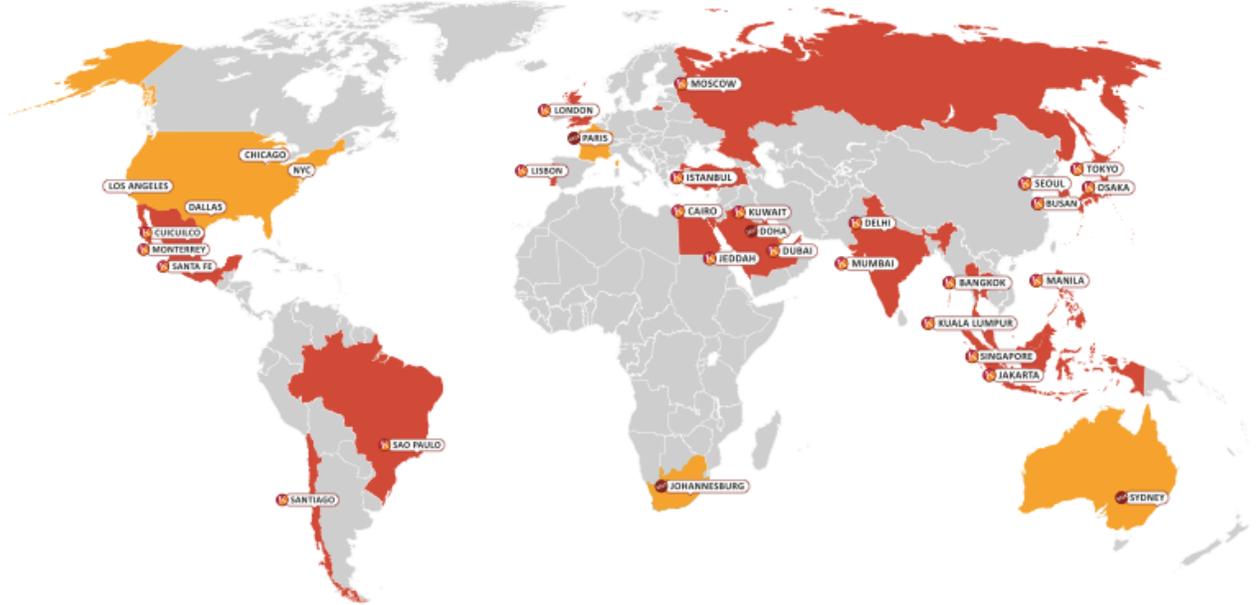


Figure 5. KidZania Parks locations (KidZania, 2018)

Every park is built and themed as a child-sized city, with shops, theaters, buildings, even the vehicles along the city streets. Participants can try more than a hundred professions at each park. This city for children aged from 4 to 14 is a place, where only in that range of age, children could participate in the activities. Almost all activities are branded. Brands depend on the country where the new park is located, it could be from bottling beverages manufacture by Lipton (Unilever) or Coca-Cola, cooking burgers in McDonald's or Burger King restraint, working by dentist in Crest or Colgate office, and using airline tickets or even getting the pilot license from British Airways, American Airlines or Emirates.

It is a real microenvironment with its own currency bank and police office where children earn money during participation in activities and performing the tasks. The money is kept in the Bank and it could be spent at the park's activities or shops. Children are capable to fly a plane, become a firefighter, create their own animation or TV show, and even conduct research in the lab. (KDZ) KZ Moscow was opened in January 2016 in the largest Europe shopping mall – Aviapark.

This project is not only a business and marketing for market giants but also it is a social project with strong security and accessibility requirements. It is a place where

all the children with special needs become an equal part of KZ park society (Company Founder and President). In KZ Moscow children besides master different professions get their basic financial literacy lessons. The first money that children get will not be enough to cover something at once. That will lead to making the first financial decision about spending or earning money. It could be critically important in children future adulthood.

2.2.2. Company organization structure

Revenue in 2016 is 36 bln. USD according annually report the Global company overall. **The margin in 2016** is 48 mln, 4%. This index could not be the core measure of effectiveness for the startup project.

Today in KZ Moscow there are approximately 300 employees. The overall structure of the company allows estimating the effectiveness and exploring the basic interconnection of the company. As we can see from the chart, the case company is the line and staff organization. Such organization structure involves many conflicts in interorganizational communications. It should be mentioned that there are many projects in the company from the small (birthdays events) to the big ones and strategically important (special events and developing new zone with a new partner). More detailed organization structure analysis and identifying the bottlenecks and the other weakness of the structure and suggestions could be made after closer process mining in the following paragraphs.

At the Figure 5 we could see the departments that are direct or indirect procurement process participants and stakeholders which on a regular basis communicate with the procurement department. It is *financial department; accounting group; marketing and sales (commerce group) and legal department*, considering the company specialization we emphasize in addition to *On-the-job safety and industrial security department and park operation department*.

According to the structure logistics and procurement group is directly subordinates to financial director and consists of one senior specialist and two junior procurement specialists with experience less than a year. Juniors positions were entered just a few

months ago to assist the senior as was mentioned in the introduction all the function and knowledge was concentrated in one specialist. The communication between the financial director and the procurement specialist engage assistant in resolving conflicts between lower-level specialists from the financial and procurement departments and approving irregular payments with a large sum. The integrated planning system is not implemented in the company: all the departments are separated and independent that leads to many conflicts between groups and departments, information asymmetry and overlapping. Instead of helping each other and work like a consistent and integrated system there are separated and unconnected units, which are committed to their own goals.

The inventory group as a part of logistics functions provides the procurement group with information about stock and items which are going short, *order quantity based on know-how* without any analysis. As we can see from the structure (Figure 6), the inventory group is subordinated to Administrative departments; the reason is the specialists and their actual functions in the company. Both inventory group members are unskilled and unqualified to manage any inventory management process they are operating warehouse staff with no analytical skills. The name of the group "Inventory management group" is nominal given by human resource (HR) specialist and because. As a result, there is no qualified and skilled labor to oversee the inventory in the company. The information and data about the needed order quantity and time between the orders translated by the warehouse staff is unconfirmed and there is no previous experience and historical data in it. The reasons for the organization's structure weaknesses and as a result inefficient process and operation process are insufficient enrollment on the part of top management into company areas (logistics/cost-efficient/inter-organization business process) and low-level specialists of logistics and procurement group.

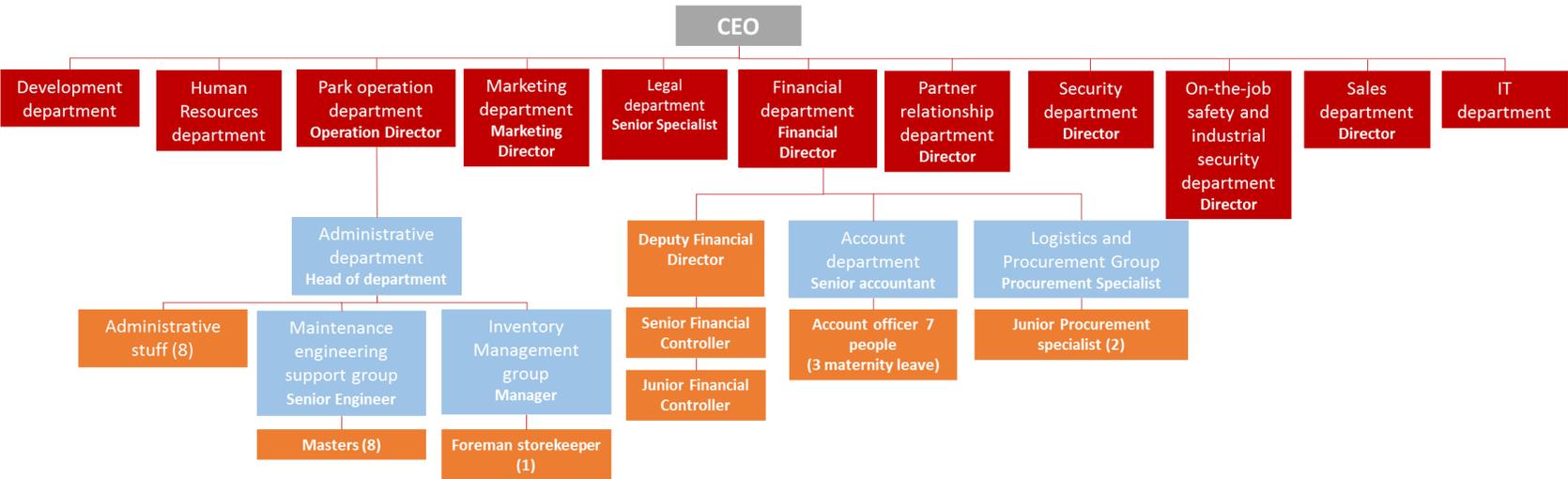


Figure 6. Organization Structure

overall there are up to 73 points and approximately 4 more are going to open in three months. Moreover, there is a reverse flow of the goods from the warehouses, it could be rejected product because of supplier mistakes or returnable items such as pallets.

The company's supply chain demonstrates the big list of suppliers and nomenclature that makes the supplier relationship management and inventory management in the company area of interest. Suppliers are not classified, and all are treated almost the same. The different only depends on the amount of the purchase. If the purchase is under the 100 000 RUB it could be processed without a contract and as a maverick purchase, in other cases, above the 100 000 RUB the contract should be signed.

Besides the long list of challenges mentioned above, there are other ones which cannot be covered by the study: organization structure issues, employee's professionalism, lack of inventory management and deficiency in supplier relationship management. The other problem for the company in supplier relations is a small but frequent orders and small overall capacity to attract the suppliers and build strategic sourcing (conducted interviews).

2.2.4. Supply function challenges

Considering both internal and external environment the core supply function challenges and area for improvement are identified bellow:

- **Inventory management**

Problem: Any analysis, planning of inventory deficiency; qualified labor force deficiency

Optimization in: Purchasing planning corresponding with park admission and seasoning; Inventory control;

- **Supplier relationship management**

Problem: Sourcing strategy deficiency; Supplier classification deficiency; historically developed suppliers base; No suppliers monitoring and assessing process; Price is the only criteria of selection

Optimization in: Relationship strategies; supplier selection model and development tools; Information exchange process;

- **Purchasing process**

Problem: Process mapping deficiency; there is no clearly determined zones of responsibility and recorded procedures; Reactive sourcing; improper information flow.

Optimization in: Instruments of process mapping; modeling requirements and related procedures; Metrics and measurements – department's KPI;

For department, it is essential to analyze the current effectiveness of the department; material flow; planning; inventory management; supplier relationship. Because the company is young and has been only couple of years on the market it has faced a lot of challenges in different functions and departments, in this thesis it is difficult to cover all of them and the focus of the study will be on the supplier relationship management and purchasing process.

3. Supply Management in Literature

In this chapter, through the academic literature review and the analysis of the existing instruments and concepts suitable for the case company issues are identified in the first paragraph.

The definition of the Supply Chain in a broad sense is a system of material, information and financial flows which links two or more organizations. These organizations might be producers of components or end products, end consumers themselves and third-party services providers (Figure 8).

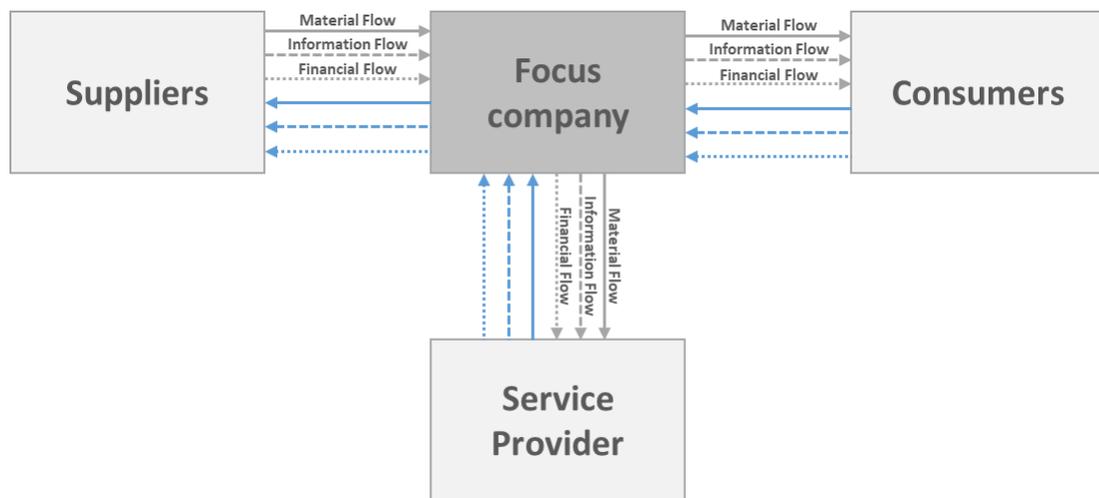


Figure 8. General Supply Chain

The ongoing process of increasing competitive rate because of business globalization trends resulted in the situation where competition exists between integrated the supply chain rather than individual companies. That is why today, companies are paying serious attention to effectiveness in supply chain. To achieve this objective, companies refocus on the core capabilities while increasing the number of services, components parts and functionalities they outsource (Krause 2000).

Nowadays companies are aware of the essential role of the suppliers in achieving competitive performance and arm's length transaction is a thing of the past, they started to change buyer-supplier relationships (Maloni and Benton, 2000). According

to Tan and Tracey (2001), companies should encourage supplier involvement in the supply chain. As a result, the distance between suppliers and buying firm is reduced, parties of relations became partners and they cooperate more closely. However, partnership frequently fails, in addition, suppliers are not able to support buying firms competitive effort (Hendrick and Ellarm, 1993). In case of the underperforming supplier, a purchasing company can decide to look for a new supplier or to help the existing one.

The majority of supply chain management discussion considers that there is no way to manage sourcing in the company. As the supply chains are different with unique features, characteristics and constraints, and the suppliers have they own limitations and operational issues suppliers should be managed differently. The ability of the company to analyze the suppliers strategically, define the suppliers who contributes to core competences and competitive advantage, realize benefits of using both arm's-length and partner models gives an opportunity to develop the effective supply chain and gain future competitive advantage (Kraljic, 1983), (Jeffrey H. Dyer, Dong Sung Cho, Wujin Chu, 1998).

3.1. Purchasing

Clarifying the terms before proceeding with study is essential. It helps to avoid confusion about subject. Do purchasing, procurement and sourcing mean the same? What the supply chain is we have already defined above.

The traditional point of view on purchasing function is that activities relate to the maintenance of the required products (materials) in needed quantity and quality, in the right time and right place with adequate price, from the right source (Robert M. Monczka, 1993). The purchasing function covers all processes of buying. Last decades business started to expand this statement and besides the product, the supplier of this product became to play significant point of interest. A lot of studies and business approaches have been established in the supplier relationship management sphere. Purchasing includes defining the need, supply market research,

choosing supplier, managing proper price and conditions, negotiating, contracting and ensure delivery, developing purchasing system (Monczka et al., 2003). The terms “purchasing”, and “procurement” will use as synonyms in this study.

Sourcing is wider than purchasing it includes all the business processes required to proceed to purchasing the goods. Such as planning and analyzing the demand, setting the goal to optimize the processes and cutting the total costs (Chopra & Meindl, 2010).

3.2. Purchasing Strategy

Purchasing strategy usually discussed as a set of the specific actions that the procurement function should take to achieve the purchasing function’s goals (Carr and Smeltzer 1997). The actions usually cover how to select the suppliers, that what is suppliers are working with, how to operate with them and what kind of relationship to establish (Kraljic, 1983). However, nowadays more studies started to consider the purchasing strategy wider and cover environmental and ethical issues (Murray, 2000). Many companies shift their strategies from the traditional competitive to the partnership relations (Virolainen, 1997). Today, when the fact of ability of the purchasing function to be a strategic advantage of the company and affecting to corporate strategy, is accepted by majority, the researchers define different aspects of this influence and discussing the integrated strategies approach.

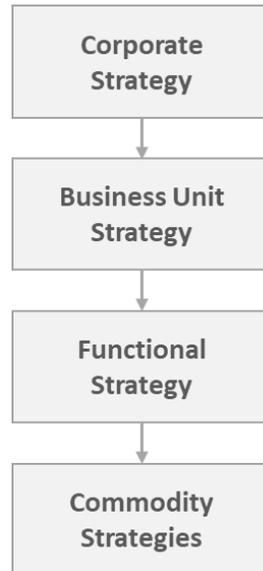


Figure 9. Four levels of Strategy development process (Monczka et al., 2003)

The strategies should not be developed and implemented separately. Supply management strategies as other functional strategies should be aligned with corporate objectives. Monczka et al. depicted four levels of strategies (Figure 9):

Corporate strategy: This strategy answers the questions (1) where the company overall is going in long term future and (2) how it will operate a business and allocate resources.

Business unit strategy: When corporate strategy covers all business in a company business unit strategy concerned only with business units, its' constraints accordingly corporate strategy and conditions of current position maintenance or achieving new goals.

Functional strategy (Supply chain strategy): These strategies at the operational level includes strategies of different functionals (marketing, finance, etc.). Strategies aggregate the direction and objectives of functionality to support the business-level strategy. The supply chain strategy is a part of the functional strategy level.

Commodities strategies: Monczka (2003) identified commodity strategies as the last level in the strategies' hierarchy from Supply Chain point. These strategies on the

level of specific purchased commodity support the supply management, business unit, and corporate strategy.

There are different concepts of commodities strategies, Kraljic (1983) defines four types of purchase classes that are allocated at the two-by-two matrix. Strategies depend on two factors: (1) importance and value of purchases for the company and (2) complexity of suppliers' market. The importance includes profitability, value-adding and total costs. The complexity of the supply market considers suppliers according to different parameters (entry barriers, insufficiency, unique expertise, etc.). Combinations of these two factors give four quadrants each of them means different strategy (figure 10). This concept allows developing customized strategies for different pools of suppliers accordingly to its specifications. Four strategies are materials management, supply management, purchasing management, sourcing management.

Purchasing management is a suitable strategy for purchases with low importance and noncritical items (commodities, specified materials) and low complexity of the supply market where a vast of players on the market. These purchases are mainly routine, and companies use regular contracting and focus on standardization of the processes (Caniels and Gelderman, 2005).

Low supply market complexity while high importance of purchases is the main characteristics of Materials management strategy. Items from this quadrant so-called leveraging products usually with low price but have a vast share of total costs. The main strategy focus is cost/price efficiency, materials flow management and purchasing volume. Supply risk is low because of multiple local suppliers. This situation allows the buying company to manage with suppliers more aggressively (Van Weele, 2000).

Sourcing management strategy is suitable when both importance of purchasing and supply market complexity are high, mainly applicable to specific items. Focusing on

this strategy, typically on the bottleneck products, suppliers primarily have dominant positions with unique new technology hard to copy by other suppliers.

Supply management is valid for purchasing strategic items where the importance of purchasing and supply market complexity are high. These strategic items often could be supplied by a single supplier that makes supply risky. The focus of this strategy is on buyer-supplier relations and building partnerships. Close coordination with suppliers gives an opportunity to improve the quality of the purchased items, reduce lead time, delivery reliability and result in cost reduction and mutual trust and confidence (Tuten and Urban, 2001).

While Kraljic (1983) primary considered strategic items located on Supply management quadrant other categories were discussed more closely by following studies and this gap was filled (Van Weele, 2000, Syson, 1992). These studies reform the original version of the Kraljic and add the recommendations for each purchasing strategy quadrant (Caniels and Gelderman, 2005). Further scholars enlarge the number of strategies and bowl down each initial 4 portfolios into several strategies.



Figure 10. Kraljic's portfolio matrix (1983)

Dubios and Pedersen (2002) stated that the significant part of the fundamental assumption of Kraljic's portfolio concept is power and interdependence, exploitation of purchasing power and minimizing supply vulnerability. Later studies determine the mutual dependency from the perspective of both suppliers and buyers' side (Kumar et al., 1995). While Kraljic in his work argues that there is one strategy in each quadrant for the product group, recent researches emphasized that practitioners identify several supply strategies within each portfolio (Gelderman and Van Weele, 2003). There are two main concepts to division inside one quadrant (1) maintaining the current position of suppliers and (2) switching between quadrants and changing the position (Caniels and Gelderman, 2005).

Recent studies are discussing that it is difficult to develop one comprehensive strategy on the functional purchasing level and it should be a set of diverse integrated strategies and tactics for different types of purchases and suppliers. And to develop this set of strategies diverse levels of integrated analysis should be conducted. Recommendation for developing an effective purchasing strategy will be defined below.

3.2.1. Process of developing purchasing strategy

Above was mentioned that supply management and other functional level strategies should contribute to corporate strategy. To do that management have to translate corporate objectives into the specific management goals on the functional level and develop an integrated strategy.

There are different approaches to build an integrated supply management strategy. Monczka (2003) defined five following steps of strategic sourcing process: (1) building a team to develop a plan and identify work scope; (2) market research to gather the information and understand the current market environment; (3) strategy development to classify suppliers and identify sourcing approach; (4) contracting this part include the negotiation part; (5) supplier relationship management to develop communication tactics and continuous improvement plan.

Virolainen (1998) aggregated several papers and defined a general framework developing an integrated strategy. Framework contain five main phases:

- 1) Information Gathering
- 2) Identification and determination
- 3) Integration
- 4) Decision making
- 5) Implementation and measurement/evaluation

At the first two steps, corporate mission and competitive business unit strategy are defined after analysis. The integration part covers integration of functional-level strategies. Decision-making phase in terms of supply chain strategy contains the answering to question make or buy. And the last phase is an implementation which includes the supplier selection approach, communication concepts, evaluation issues, and performance measuring.

“The success of a strategy depends on doing many things well – not just a few – and integrating among them” (Porter, 1998). This phrase could sum up the purchasing

strategy part. In the following parts supplier selection, segmentation concepts will be discussed, and supplier management issues will be considered.

3.3. Supplier selection

Developing a rational supply base selecting and segmentation is an essential part of supplier management which is part of the supply strategy. Recognition of all suppliers is the first step in building an effective approach for managing suppliers. Supplier selection and segmentation are closely connected after the supplier was selected it should be allocated to a specific supplier portfolio (Park et al., 2010). But before that the supplier selection buying company should determine the so-called sourcing strategy.

3.3.1. Sourcing strategy

Sourcing strategy is a combination of three dimensions (Burke and Vakharia, 2004): a) establishing supplier base criteria; b) criteria for supplier selecting (a subset of the base); c) the quantity of ordering goods from each supplier. Usually, in literature, two basic strategies are mentioned for selecting suppliers: choosing a specialized supplier (single sourcing) or a generalized (multiple sourcing).

The single-sourcing idea is to have one vendor for each inventory item. Single sourcing tends to establish a partnership between buyers and suppliers for effective cooperation and benefits sharing. Just-in-Time (JIT) concept encourages companies to shift supplier relations toward a single supplier strategy to achieve required by supply chain tighter coordination. Technology capabilities and widely used integrated information systems enable closer management of suppliers and cutting down procurement costs. On the other hand, a single sourcing creates dependency and risk of supply chain interruption. In this case, multiple sourcing provides greater assurance and upside-down volume flexibility because of the diversification (Ramasesh et al., 1991).

In the multiple sourcing, companies split the order between several suppliers. The reasons usually limited supplier capacity and reduction of risk. This concept provides volume flexibility, greater assurance on timely delivery, healthy competition between suppliers. However, managing several suppliers is more complicated. For instance, coordination issues, sharing the information and trust, efforts to maintain loyalty (Burke et al. 2007). Because of this option is less risky it is preferable for global companies and companies with outsourcing strategies to reduce dependency risks.

3.3.2. Identifying criteria for supplier evaluation

A lot of the literature in supplier management concentrates on supplier selection and evaluation. Defining criteria is crucial of the supplier selection process and must be done after a deep analysis. The criteria for supplier selection should be based on the company's needs and goals, industry sector where the company operates and the product itself (Vokurka et al. 1996) make a significant impact on the selection criteria. Such as great priority to criteria that related to on-time delivery as a reflection on the Just-In-Time concept. When outsourcing strategy became more popular among the companies, one of the crucial criteria became the supplier geographic location. Later, the recent trend focus on sustainability has made social and environmental related criteria prevail upon traditional criteria.

Below there is a review of criteria used in supply management and the methods of identifying them. Firstly, traditional criteria is explored and then environmental criteria is discussed.

Traditional Criteria

There are many types of researches and analysis conducted to identify a pool of key criteria. In 1966, Dickson identified 23 criteria during the analysis of the survey about supplier selection criteria among the 170 respondents who were purchasing managers and agents. Criteria were ranked according to the value of criteria given by participants. Weber et al. (1991) and Deshmukh et al. (2011) made literature reviews with 74 and 49 articles analysis. In this studies delivery price, the quality was the

most frequently used (Table 2). These studies allow seeing the priority in criteria at the different times. For instance, performance history in the 60's was more relevant than price while it has great importance in 2011. The reason could be that company performance efficiency measured by capacity and distribution costs. On the other side, in the 90's supplier location was on the top five while in the 21st century technical capabilities and supplier financial position took their place. The reason for that fact is started globalization process when the international companies started to switch to outsource strategy and looking for international partners (suppliers) when the geographic location becomes an important criterion. After companies operated with abroad suppliers, financial stability and the ability of information exchange it means the capability of using technology became the priority in selection to further control (Min 1994). In the last column, the last review by Turkish authors has presented. The study includes analysis of 90 articles made from 2011 to 2015. It is important to emphasize that in this review Flexibility become one of the top ten criteria. The reason is that together with ongoing global competition, extremely fast-changing of global and business environment suppliers must be flexible to meet buyers' requirements.

Table 2. Criteria according to their popularity in selected literature reviews

| Criteria | Dickson (1966) | Weber et al. (1991) | Deshmukh et al. (2011) | Yildiz (2015) |
|-----------------------|----------------|---------------------|------------------------|---------------|
| Net price | 6 | 1 | 1 | 4 |
| Delivery | 1 | 3 | 2 | 2 |
| Quality | 2 | 2 | 3 | 1 |
| Capacity | 5 | 4 | 4 | |
| Technical capability | 7 | 6 | 5 | 9 |
| Financial performance | 8 | 9 | 6 | 5 |
| Geographical location | 20 | 5 | 7 | 8 |
| Performance history | 13 | 7 | 7 | |
| Operating controls | 3 | 9 | 7 | |
| Management | 14 | 13 | 7 | |
| Flexibility | | | | 6 |

There is a classification that divides the criteria into three categories: element of exchange criteria, relationship-related criteria, supplier-related criteria (Rezaei and Ortt 2012). However, traditional supplier selection methods mostly include only the first category of exchange-related criteria. The combination of all three criteria allows to identify a wider perspective of supplier willingness and capabilities to develop and maintain a potential long-term partnership.

Sustainable Supplier Criteria

Social Criteria

There is a limited number of researches, who have focused on and consider environmental factors as a part of supplier evaluation (Seuring 2013, Govindan and Kannan et al. 2015). Environmental and social criteria are important for developing and enhancing overall supply chain performance. Klassen and Vereecke (2012) consider social aspects in the supply chain that affect the community and human welfare, the safety they define them as product or process-related issues of company operations. Authors identified core social management capabilities through the related relevant literature: collaborating, monitoring and innovation.

Companies may use following instruments for developing social criteria (Benoît and Vickery-Niederman 2010):

- **Forums.** In business forums, organizations share their experience with social and supplier issues, there are a lot of them such as Business Leaders Initiative on Human Rights (BLIHR), Business for Social Responsibility (BSR) etc.
- **Implementation Guidelines of Social Responsibility.** As an example of Social Responsibility is ISO 26000. It is a standard provides some orientations on processes.
- **Sustainable Reporting Frameworks.** They provide principals of responsibility. Through developing indicators, evaluation and monitoring process are implemented.

- **Auditing and Monitoring Frameworks.** Includes set of tools to monitor following the Codes of Conduct. Until 2000s companies mostly use their own Code of Conduct and measuring methodologies, today there are several overarching frameworks.
- **Financial Indices.** The most widely used sustainability index is Dow Jones. These indices collect the data from public companies to evaluate their level of sustainable and overall performance.
- **Social Assessment.** Beside instruments, frameworks there are methodologies that are important to consider such as Human Rights Impact and Value Chain Analysis, Social Impact Assessment.

Green Criteria

Ellram, Tate and Carter (2004) included in supplier selection criteria as an identification for the companies pioneers in environmental supplier management. Handfield et al. (2002) through the AHP and Delphi method based on the expertise of Fortune 500 companies establish environmental indicators. A framework to integrate environmental factors into the supplier selection process was generated by Humphrey (2003) through collecting data from the literature. The Framework includes criteria and sub-criteria:

6) Management competencies

- Senior management support
- Information exchange
- Environmental partners
- Training

7) Design for environment

- Reuse
- Recycle
- Re-manufacture
- Disassembly

- Disposal
- 8) Green image
- Green market share
 - Customer's purchasing retention
 - Stakeholders relationship
- 9) Environmental management system
- Environmental policies
 - Environmental planning
 - Implementation and operation
- 10) Environmental competences
- Clean technology availability
 - Use of environmentally friendly materials
 - Pollution reduction capability
 - Returns handling capability

Kumar and Jain (2010) provided a comprehensive approach for supplier selection through carbon footprint monitoring. This approach is universal almost all businesses could use it. It could help companies to reduce their carbon footprint and encourage to go green.

Companies become more often include environmental criteria in the traditional set of selection, on the other hand, environmental criteria still more challenging for companies to follow. Munda (2005) determine those general challenges for the firms are dealing with environmental supply chain:

1. **Measuring complexity.** Although traditional performance indicators usually quantitative, environmental and social criteria require qualitative more often. Qualitative metrics are measured in nominal or ordinal scale while quantitative information on ratio scale or intervals.

2. **Non-compensability.** The situation of inconsistency between the real theoretical meaning and the way weights are actually are. For example, man-made capital cannot completely substitute some natural capital as trees.
3. **Incommensurability.** Value conflict exists when there is a tentative comparison with one common term of different units of measure to represent the real world.
4. **Simplicity.** There is a possibility of an existing lack of transparency because of a large number of criteria, on the other hand, using several criteria allows to improve transparency and adequacy of any decision model.
5. **Uncertainty.** Dealing with sustainable problems means issues with data lack of precipitance, certainty, exhaustion.
6. **Risk.** Should be assumed by the researcher and decision-maker.

Above general issues were determined, beside them there are several problems specifically with incorporating environmental and social criteria.

1. Data collection complexity
2. Data collection costs
3. Lack of standardized criteria and metrics
4. Lack of criteria addressing the supply chain

Criteria should be driven by company specificity and priorities. Company managers should mitigate risks and consider all accompanied challenges.

3.4. Supplier Segmentation

Supplier segmentation is allocating and ranking suppliers according to specific criteria variables. Segmentation is staying close with supplier selection, but it is not well researched and developed by scholars as selection issues (Rezaei and Ortt, 2012). Supplier allocation and segmentation could be considered as subprocess of supplier selection, but in this study supplier segmentation been viewed as part of supplier relationship management and development.

Segmentation generally bases on diverse criteria: purchase item characteristics, logistic flow type, type of supplier and relationship. Some literature argues that criteria should consider specific industry characteristics and the current business environment. Syensson (2004) as the first step in supplier segmentation identified the importance of choosing a segmentation framework which is a way of suppliers' allocation and a number of segments.

The fundamental concept of supplier segmentation is Kraljic's (1983) portfolio approach that was discussed in the supply strategy chapter above. In his research segmentation was based on purchased items typology and suppliers' market complexity. The variables in the portfolio approach were profit impact and supply risk. Even if his study was published a long time ago it is still the basis of the current supplier evaluation concepts. His approach had been implemented by big business players including Siemens, Philips and Shell (Gelderman & Van Weele, 2002). Gelderman and Van Weele (2003) focused on measurement issues and supply strategy feasibility and bowl down strategies on the commodity level. Pagell, Wu, and Wasserman (2010) considered sustainability challenges and developed a portfolio model which is applicable for sustainability supply chain management.

Luzzini et al. (2012), Karjalainen and Salmi (2012) developed a sourcing category classification approach based on different competitive priorities of the company as the purchasers are using several strategies for suppliers allocated in one portfolio

quadrant. The authors defined the following priorities: efficiency, cost, quality, sustainability, delivery, innovation.

There are scholars focused on segmentation on the supplier's development dimension. Wynstra and Ten Pierick (2000) identify two classification parameters: development risk and degree of development responsibility. This concept might be relevant for strategic suppliers but will not be relevant for transactional purchases suppliers. Ollsen and Ellarm (1997) proposed classification formed on two dimensions: purchase situation complexity and strategic importance of the purchase, this approach is close to Kraljic's portfolio. Dyer et al. (1998) identified two main supplier categories: strategic partners and arm's-length suppliers. The first category supply valuable items relate to buying the company's core competence and the second type is supply non-critical items. Classification focused on relationship length (long-term and short-term) was proposed by Masella and Rangone (2000).

All the segmentation approaches that were considered above have limited number of parameters/variables. Rezaei and Ortt (2012) proposed the first attempt to develop an integrated approach so-called supply potential matrix that will cover all the relevant parameters. Moreover, the authors consider the shifting trend from product-characteristics-based portfolio to a combination of product and relation attributes (Hudnurkar et al., 2016). All the variables were divided into two main dimensions: (1) Supplier capabilities and (2) Supplier willingness. Capability covers the supplier expertise and knowledge; supplier willingness means suppliers' motivation to collaborate with the purchasing company.

3.4.1. Classification criteria

To be able to analyze and differentiate the suppliers establish a set of criteria is required. This is where supply classification comes in. According to Kraljic (1983) organizations' purchasing strategy depends on two factors. The first factor is the strategic financial impact of the purchase and the second is the complexity of the supply market. Other authors have suggested other ways to classify suppliers that

vary from different complexity perspectives to the effects of the suppliers' brand on purchasing organizations operations (Olsen & Ellram 1997).

When applying supply classification certain precautions should be taken. Classification criteria like effects of the image, procurement risk, or other abstract measures may be extremely difficult and thus the recommendations given by these measures should be used with care. (Gelderman & Van Weele 2003) In addition, when choosing and defining the criteria the measurer should be positive the chosen criterion and the factors associated with it are related in a meaningful way.

The supply classification criteria can be sorted into six main categories that are usability class, financial impact, strategic importance, procurement risk, supplier relationship and the complexity of the purchase. All of them provide a different aspect of the company purchase process. The classification criteria are explained in the following subchapters. A summary of the supply classification criteria considered by authors is demonstrated below.

Table 4. Supply classification criteria

| Criteria | Description |
|-------------------------------|---|
| Usability class | By type Gadde & Håkansson 1993, 13 - 20, |
| Financial impact | Classification through monetary impact Kraljic 1983, Burt 1989 |
| Strategic importance | Classification through their long-term impact Olsen and Ellram 1997, Bensaou 1999 |
| Procurement risk | Purchase classified by their potential problems Harland et al. 2003, Kraljic 1983, Van Weele 2005, |
| Supplier relationship | Classification based on supplier relationship Olsen & Ellram 1997, Cox, 2001, Dubois & Pedersen 2002 |
| Complexity of purchase | Classification is done according to their technical complexity Van Weele 2005, 37 |

The simplest way to classify suppliers is to divide them into groups by their technical or other properties. Technical properties can be anything from how the product or service is used. Gadde and Håkanson (1993 13 - 20) have found five classes that

purchase can be classified according to their use. The groups are devices, components, processed material, maintenance and services. Another and higher perspective for this type of classification is ranking them according to their financial use. This kind of ranking can be direct, indirect and investment purchases.

A typical way to classify purchases is to look at their financial impact. The main aspect of the financial impact is how much the purchase affects the organization's profits. However, the direct profit is not the only perspective to financial impact: the financial impact can be explored in the following questions. "How much did the purchases spend?" asking how much is used on the current purchase or the substitutable purchases, "How much is the profit per purchase?" (Kraljic 1983) and "How much of bad quality costs come from the purchase?" (Burt 1989).

The strategic impact is an important aspect of supply classification. With supply classification insights can be gained about the purchase's long-term effects. Olsen and Ellram (1997) consider how does the purchase bring benefits for the final offering to the customer and how much-added value it brings. In addition, the authors recommend considering the spillover effects of the purchase, including the effect of other purchases that affect the prices of items from the same supplier.

Bensaou (1999) has introduced two ways to categorize purchases in a strategic manner. The first of them is to categorize suppliers with the investment size the purchaser commits to the supplier. Investments can include purchasing organizations investments to equipment and machinery, modifications to the process to fit the supplier's products and training of personnel to be able to realize the benefits of the supplier. Bensaou (1999) also notes that investments to modifications can lead to a vicious circle, which demands more and more investments in the future. The other perspective introduced by Bensaou (1999) is to look at the supplier's investments to the supplier-purchaser relationship. These investments can be capacity and warehousing. Additionally, they can be changes to the supplier's ERP system to be compatible with the purchasing organization.

According to Olsen and Ellram (1997) competence and image factors of the supplier relationships should be considered when assessing the purchase. By competence, it is meant how close the purchase is to the core competence of the company. Additionally, development of competence should be understood. The authors have additionally presented an image perspective that is related to corporate responsibility as environmental and security factors are mentioned. Thus, the supplier's image and the potential input of it on business should be considered to understand the whole potential strategic effect of the purchase.

Purchases can be classified by the measuring and grouping factors of the supplier relationship. These factors include division of the power between the supplier and the purchaser and the technological and commercial competence of the supplier. (Olsen & Ellram 1997) Power division is an important perspective of what looks at the dyad gains of the transactions is important. (Cox 2001) It is difficult to evaluate the supplier relationship precisely by revenue and spend. Evaluation is difficult because the supplier relationship can affect the organization in many ways other than a purchasing case. (Dubois & Pedersen 2002)

Early researchers presented a classification category that is based on the analysis complexity of the purchase. When assessing the complexity of the purchase it should be considered how the purchase affects the organization. (Van Weele 2005 37). According to Van Weele (2005), the purchase and its complexity may affect the organization when completely new systems or machines are procured which's use requires organizational change. The change can vary from personnel training to a variety of process changes.

Rezaei and Ortt (2012) according to the proposed two dimensions approach listed a pool of factors attributing to each dimension that led to a multi-criteria portfolio model.

Defined factors that were discussed by other scholars are not equally important for each business and in every industry. Every case has its their own critical factors that should be identified as variable to be evaluated. The process of selecting criteria

should base on knowledge and get experts and decision-making team involved. The whole selecting process steps must be agreed and determined: how the criteria would be assessed and by whom (Rezaei and Ortt, 2012).

3.4.2. Segmentation Model

The number of segments depends on segmentation objectives and industry characteristics. The decision of the segmentation model should be taken by experts and the model could be modified on demand. If the suppliers from different portfolios managed equally it is a sign to reduce the number of segments. And on the other hand, if in one portfolio segment suppliers could not be managed by common strategy the number of segments should be increased. Together with a number of segments scale of segmentation should be defined (Rezaei and Ortt, 2012). In this chapter the segmentations frameworks provided by other researchers will be discussed and aggregated.

All segmentation approaches mentioned in the introduction of this chapter could be divided into three methods:

- 1) The process method
- 2) The portfolio method
- 3) The involvement method

These methods were summarized by Rezaei and Ortt (2012) as a result of relevant literature analysis. Bellow a table provided with main scholars in supplier segmentation subject and defined variables, supplier segments, methodology and segmentation method.

Table 5. The approaches and methods to supplier segmentation (Rezaei and Ortt, 2012)

| Authors | Variables | Suppliers Segments | Methodology | Method |
|--------------------------|--|---|--------------------|-------------------------|
| Parasuraman 1980 | - | - | Conceptual | Process |
| Kraljic 1983 | <ul style="list-style-type: none"> Profit impact Supply risk | <ol style="list-style-type: none"> 1) Non-critical items; 2) bottleneck items; 3) leverage items; 4) strategic items | Conceptual | Portfolio |
| Olsen and Ellram 1997 | <ul style="list-style-type: none"> Difficulty of managing the purchase situation; strategic importance of the purchase | <ol style="list-style-type: none"> 1) Non-critical; 2) leverage; 3) bottleneck; 4) strategic | Conceptual | Portfolio |
| Dyer et al. 1998 | Recourse allocation | <ol style="list-style-type: none"> 1) Durable arm's-length 2) strategic partnership | Empirical | Involvement |
| Bensaou 1999 | <ul style="list-style-type: none"> Supplier's specific investments; buyer's specific investments | <ol style="list-style-type: none"> 1) Market exchange; 2) captive buyer; 3) captive supplier; 4) strategic partnership | Empirical | Portfolio & Involvement |
| Kaufman et al. 2000 | <ul style="list-style-type: none"> Technology; Collaboration | <ol style="list-style-type: none"> 1) Commodity supplier; 2) collaboration specialist; 3) technology specialist; 4) problem-solving supplier | Empirical | Portfolio & Involvement |
| Masella and Rangone 2000 | <ul style="list-style-type: none"> Time frame; Content | <ol style="list-style-type: none"> 1) Short term & logistic; 2) long term & logistic; 3) short term & strategic; 4) long term & strategic | Conceptual | Portfolio & Involvement |
| Van Weele 2000 | <ul style="list-style-type: none"> Profit impact; Supply risk | <ol style="list-style-type: none"> 1) Partnership; competitive bidding; 2) securing continuity of supply; 3) systems contracting | Conceptual | Portfolio & Involvement |
| Svensson 2004 | <ul style="list-style-type: none"> Supplier's commitment; Commodity's importance | <ol style="list-style-type: none"> 1) Friendly; transactional; 2) family; business partner | Empirical | Portfolio & Involvement |
| Hallikas et al. 2005 | <ul style="list-style-type: none"> Supplier dependency risk; buyer dependency risk | <ol style="list-style-type: none"> 1) Non-strategic; 2) asymmetric (captive supplier); 3) asymmetric (captive buyer); strategic | Empirical | Portfolio & Involvement |

The process method

This supplier segmentation method was described as one of the first by Parasuraman (1980). The author focused on the supplier segmentation steps and the processes of

each step itself. One of the steps was selecting the relevant variables and under consideration was the process of identifying the relevant variable instead of specifying them.

The portfolio method

Supplier segmentation approaches based on product characteristics use portfolio methods that were introduced by Kraljic (1983). While Parasurman describes the process Kraljic provides specified segments and variables that already determined in previous chapters.

The involvement method

The third method classifies suppliers according to their involvement in buying companies. The stage of suppliers' involvement determines the segment and buyer-supplier relations. There are diverse classifications of involvement levels. Dyer (1998) determine the arm's length and strategic partnership. Ellarm (1991) assess involvement considering the type of contracts: short-term contracts, long-term contracts, joint ventures and equity interests.

Meanwhile, the are later papers were the authors proposed a hybrid model with a combination of methods Kaufman et al. (2000), Van Weele (2000), Rezaei and Ortt (2012) and others. Table 5 shows that almost all the studies used four segments, two of eight papers used three segments in the following part these two segments will be considered.

3.4.2.1. Four segment Model

The four-segment model is a classical two-by-two matrix that is used in different concepts. The most known two-by-two matrix is the BCG matrix so-called growth-share matrix, it is an instrument to assist the company in assess the company's product portfolio. This approach provides a big picture of the options, and the structure is mutually exclusive and collectively exhaustive (MECE) that allows to lay down a structure. In the supply chain, the most known is Kraljic's matrix which was

already depicted in previous chapters. Recent researchers proposed alternative frameworks.

Rezai and Ortt (2012) according to their concepts of capability and willingness dimensions presented new matrix with relative axis. Concept could be applied using both four and three segment model: (1) Strategic supplier segment; (2) Potential supplier segment; (3) Volume supplier segment; (4) Transactional supplier segment.

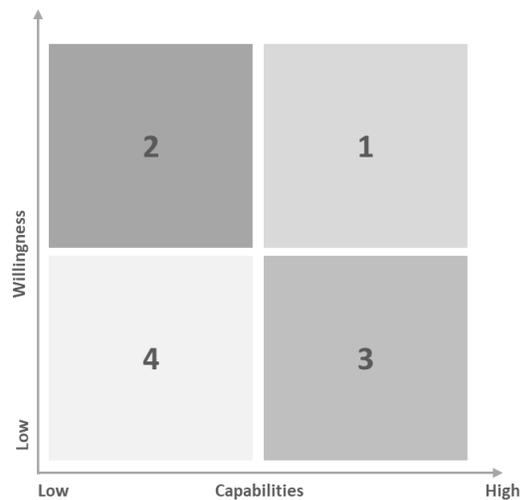


Figure 11. Four segment model

The fourth segment is transactional suppliers with low capabilities and willingness. Market relations should predominate in this quadrant and purchases usually are non-critical. Volume suppliers allocated in the third quadrant with high capabilities and low willingness. Typically, suppliers from this segment dominate in buyer-supplier relations. It is big players or highly qualified and they are not interested in building close communication with buyer although have a high capability. Potential suppliers characterized by high willingness and low capabilities. It is the situation when suppliers are ready to build strong relations, but they have no opportunity. The strategic segment with high willingness and high capabilities are the most important suppliers in the supplier base. Purchasers should pay particular attention to them as suppliers could make an invaluable contribution to company growth.

The weakness of the four-segment framework is uncompromising in other words the segments come from one extreme to another. Some of the suppliers from the transactional segment with zero willingness and zero capabilities are not interested to collaborate with buying company for mutual benefits, but in the same segment will be allocated suppliers that have average willingness and capabilities and according to this framework they should be managed equally. However, with proper relationship and supplier development activities suppliers with average potential could be switched to another segment.

3.4.2.2. Three segment Model

Three segment model proposed by Park et al. as the four-segment framework, it is presented in the two-axis model. In the study Park et al., supplier segmentation discussed as a part of the supplier relationship assessment. Supplier relationship assessment includes two parts of the strategic material evaluation and supplier evaluation. Suppliers are divided into the four segments: prime, collaboration, improvement and maintenance (Figure 12).

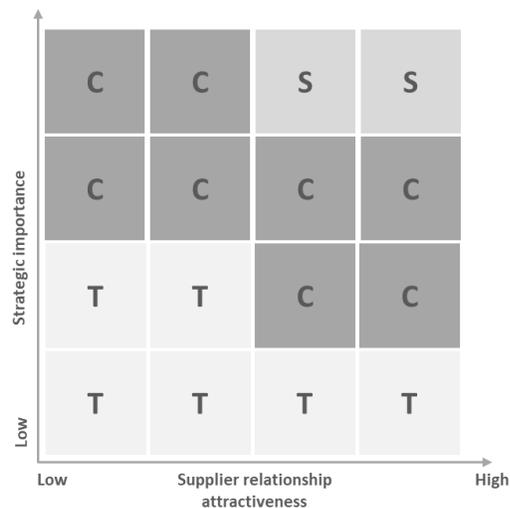


Figure 12. Three segment Model (Park et al.)

Meanwhile strategic material evaluation framework consists of the three groups: (1) Strategic relationship segment; (2) collaborative segment; (3) transactional segment.

Rezai and Ortt (2012) emphasized that their capability and willingness concept is applicable for the three-segment model as well and even more depending on the available data and complexity capability and willingness concept is applicable for the three-segment model as well and even more depending on the available data and complexity

Collaborative segment the dominant segment in this segmentation model, completely different suppliers in this concept may end up in the same supplier strategy. The third segment is transactional suppliers, this segment includes all the suppliers with low strategic importance.

While reviewing the literature relates to supplier segmentation relevant segmentation approaches and criteria were defined and highlighted in the 3.4. section. These approaches and segmentation variables formed the basis for the recommended framework developed for the case study in the following section.

3.5. Supplier Management and Development

In this study supplier segmentation is discussed as a part of the supplier development and evaluation process. Supplier management and development strategies should move suppliers from one segment to another. In this chapter, the list of supplier development activities is suggested and success factors to supplier development strategy are clarified.

Supply chain collaboration led to leverage the resource and knowledge of suppliers and valued customers to reduce uncertainty, build core competence, lower transaction costs and improve competitive position. Buyer-supplier relations where parties work together, share information, resources, risk and through joint decisions accomplish mutual benefits (Golic, 2003).

Krause et al. (2000) emphasized suppliers direct impact buyers' dimensions such as cost, technology, quality, delivery, financial performance. This impact could be either

positive or negative; besides benefits, buying firms faced problems of inconsistent with requirements suppliers, deficient performance and capabilities. The supplier development activities become a new phenomenon in 1996 (Hartley and Choi, 1996) buying firm trying to improve suppliers' performance through implementing feedbacks, evaluation and training program (Krause and Ellarm, 1997).

3.5.1. Supplier relations strategies

To develop strategic sourcing, the traditional purchasing function cannot cope with new requirements and a fast-paced supply chain. The role of purchasing has changed its nature. Old perception is based on the idea that purchasing is concerned with simple exchanges, with buyer and sellers interacting with each other on arm's length basis. The underlying interest of the buyer in this rather simple scenario is to acquire as much resources as possible for as little money as it is necessary to pay (Peter Baily, David Farmer, David Jessop, David Jones, 2005).

In figure 13, three main sourcing options are identified, each option includes several strategies and ways of buyer-supplier communications. The decision should be made by sourcing specialists taking into consideration asset specificity; type of the product (materials).

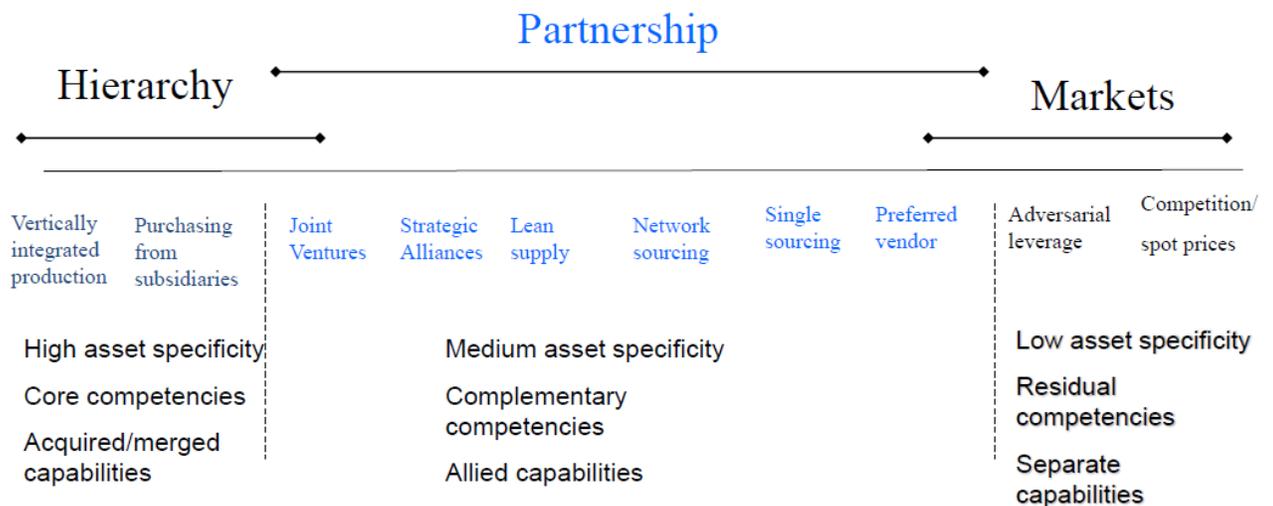


Figure 13. Sourcing options (*Blomqvist, K., Kyläheiko, K., & Virolainen, V. M. (2002)*)

In the following, we illustrate (figure 8) the main benefits provided by different governance structures.



Figure 14. Benefits from using different governance structure (*Blomqvist, K., Kyläheiko, K., & Virolainen, V. M. (2002)*)

Since each of the types has own benefits and risks, it is important to classify the suppliers and develop different relations strategies to follow for each of the supplier group. Supplier classification criteria are already mentioned above.

Buyer-Supplier relations

The development supplier relations were taken into consideration by researches two decades ago (Krause 1997, Krause and Ellarm, 1997, Leenders, 1989, Talluri et al., 2010), selecting suppliers, successful implementation factors of supplier development approach (Handfield et al. 2000, Krause and Ellarm, 1997), process of suppliers' development and development strategies. (Krause, 1999) and implementing barriers. According to Krause, suppliers' development is any effort has been done by the company to it is a supplier to increase the performance results and give the opportunity to be able to meet the future buyer firm's requirements. This definition indicates that supplier development initiatives come from a buyer firm's only side, moreover developed and managed by it. Suppliers willingly adapt supplier development programs imposed by the company (Mortensen & Arlbjørn, 2012). This effort could be in different range from limited to extensive, previous studies identify a variety of suppliers' development activities used by buying firms (Hines, 1994; Krause and Ellram, 1997; Monczka and Trent, 1991; Sanchez-Rodriguez et al., 2005). The limited effort contains an evaluation of suppliers and requests addressed to suppliers

about performance improvement. Extensive development activities contain conducting trainee sessions for supplier's personnel and investment in their operations. There are many examples of implementing supplier development activities and mostly from the automobile industry, for example, Toyota has own Support Center for training where suppliers studying the implementation of lean production concept; GM involved at least 10 people from supplier full-time to participate in development workshops (Hartley and Choi, 1996).

Supplier development issue literature considers the importance of a strategic viewpoint on supplier's relation and supplier's development (Krause, 1999). Buying firms need to manage suppliers strategically for the competitive market. Developing appropriate communication strategies between supply chain members could resolve the generality of problems (Morh and Nevin, 1990) we will discuss different strategies closely in the following chapter. Furthermore, supplier performance has a significant role in maintaining the buyer firm's competitive advantage (Watts and Hahn, 1993; Humphreys et al., 2001; Krause, 1997). Currently, plenty of supplier development approaches used by business and presented in academic literature, we summarized tools into Table1.

Hartley (1997) defined one of the supplier development advantages, in the article concept was presented as a catalyst and accelerant for changes within suppliers' operations and strategies. General Motors' workshops mentioned above, an average, give a 50 percent growth in productivity. In the process of development implementation, the team generate a list of improvement alternatives and given by the buyer's feedback stimulate suppliers for continues improvement, which is vital for the company in the current changing and dynamic environment. Gained knowledge and best development practice could be spread among other suppliers' customers.

3.5.2. Factors of successful implementing supplier development strategy

Suppliers nowadays become more than traditional suppliers of resources and/or goods but strategic partners for the firms that declare the importance of supplier in the

value chain (Kwon et al., 2010). Buyer-supplier relationship management required different skills and knowledge to gain targeted objectives and performance (Lintukangas, 2011). As already mentioned these relationships provide an opportunity to developing strategically global competitive advantage and parties of relations become strategic collaboration as competitive or transact relations (Loppracher, 2011).

There are identified success factors of supplier development program including:

1. Mutual commitment
2. Effective communication
3. Partnership attitude
4. Top management support

These factors allow succeeding in developing supplier development strategy and ultimately led to an ongoing improvement process which is a resource to competitive advantage (Sucky and Drust, 2013). Emphasized two different view of buyer-supplier relations: first is relational viewpoint and second is process-oriented. Hartley and Choi (1996) create a process model of supplier development this model includes five factors:

1. Supplier's team
2. Top management commitment
3. Joint-development team
4. Success of model line
5. Data driven changes

Previous studies considered supplier assessment, supplier award program and supplier training as a sufficient effort from buyers in supplier development (Krause and Ellram, 1997). According to 2016-year IPSERA conference traditional view where

suppliers were an element of external sub-system transforms to a more open and complex view, where distinctive systems are mutually dependent, synchronized. Factors as well transform to more engaging in buyer-supplier operative relations (Krause, 1999). Humphreys (2004) develop two lists of factors one of the infrastructure factors of supplier development and second is supplier's performance improvement factors, lists represented in Table 6.

Table 6. Success factors of Supplier development and supplier performance Humphreys (2004)

| <i>Factors of supplier development</i> | <i>Factors to improve supplier performance</i> |
|--|--|
| Strategic goals | Updating supplier performance goals |
| Long term commitment | Technological, investment and equipment |
| Effective communication | Conducting training with supplier |
| Top management commitment | Personal exchanging |
| Supplier strategic objectives | Monitoring supplier results through awarding |
| Supplier assessing | Supplier performance evaluation |
| Trust | |

Few studies define critical factors for effective and successful supplier development activities implementation most common are an effective communication (Krause and Ellarm, 1997; Krause 1999), purchasing company top management involvement (Watts and Hahn, 1993; Humphreys et al. 1997), and long-term perspective (Handfield et al. 2000). In opposite there are positions that too much communication led to non-optimal outcomes (information overload) and an optimal level of communication should be found (Wagner and Hoegl, 2005). These factors were identified to highlight the strategies of supplier relations development in the next chapter to gain both short and long-term development objectives through a detailed study of literature.

3.5.3. Supplier Development Strategies

Recognition supplier development strategies help to clarify development approaches which could support buyer-supplier relations improvement and mutual performance result. This research of strategies led to link development strategies with performance outcomes defined in the following chapter of implications.

Supplier Development strategies according Modi and Mabert

In the following supplier, development strategies considered by Modi and Mabert (2000) represented:

Competitive pressure

Competitive of multiply suppliers stimulate other suppliers to improved performance and quality of supplied services. Moreover, this strategy helps to make a comparing analysis of suppliers, their competence and performance. Multiply suppliers motivate them to maintain and improve quality services, delivery and other characteristics of high supplier' performance by rewarding them with increased volume of future business (Tezuka, 1997). This method allows buying firms to receive competitive offers from suppliers and attain cheaper purchase price and high-quality service, being less dependent on the supplier (Krause et al., 2000). Buyers develop relations with more than one supplier provide parallel sourcing in the meantime building strong relations with just one supplier – soul sourcing. Although, switching costs are stopping buyer's firm from treating suppliers for quality deviation (Richardson and Roumasset, 1995).

Evaluation system

System assist buying firms to see the progress of suppliers' performance and achieving the objectives. It stimulates suppliers to improve performance (Krause et al. 2000). This strategy contains a certification as well, besides improvement motivation systems are instruments of communication between buyer and suppliers. Supplier evaluation allows buying firm to compare supplier performance result of others and

set perspective direction standards of their performance (Krause, 2000). Assessing include managerial and technical competencies, cost, quality and delivery capabilities (Hahn et al., 1990). The feedback approach helps to buy firms' identify the achievements, lack of performance and capabilities, and encourage suppliers to improving (Krause et al.2000).

Incentives

Financial rewarding suppliers, meeting the objectives, implementation cost-saving sharing, priority consideration future business aspects, current business volume expansion, etc. (Monczka et al., 1993; Krause et al., 1998). Incentives are key motivators in building effective communication to supplier development and mutual performance result. Studies suggest that supplier incentives enhance supplier's satisfaction and possibility to fellow firm's requirements (Ghijsen et al., 2010). Positive improvement in operational knowledge, which could be transferred, follows suppliers' concentration on the quality of delivered serves to the firm and meet the required standards for future development (Modi and Mabert, 2007).

Direct involvement

Proactive buyer firm initiates suppliers' development through direct involvement (Monczka et al., 1993; Krause et al., 2000). Direct involvement could take various forms of development activities. In the case of direct development strategies buyer plays a more active role, strategy include the following approaches: equipment or capital investment, partial supplier's acquisition and investment in human and organizational resources. Direct development strategy contains direct involvement in supplier development activities by buying a firm regarding development process sponsorship. Williamson at his study (1985) correlation between buyer's investment (non-monetary) and both buyer-supplier relations and supplier development approaches emphasized that direct involvement could reduce uncertainty and transactional costs of the firm. Moreover, in literature stated that direct involvement in

supplier development enhances the benefit for both parties (Krause and Ellarm, 1997; Sánchez-Rodríguez and Martínez-Lorente, 2004; Humphreys et al., 2004).

Direct and Indirect strategies

Together with represented above classification of supplier development strategies, there is another way of distinguishing development programs at this Thesis we will examine two more strategy classifications. The first one is direct and indirect supplier development strategies to implement activities, partly it was mentioned above. Mostly in previous studies with few exceptions (e.g. Sánchez-Rodríguez, Hemsworth and Martínez-Lorente, 2005; Martínez-Lorente, 2005; Hartley, Jones, 1997) classified strategies by the buyer company's commitment to supplier (e.g. Krause, 1997; Krause, Calantone, Scannell, 2000; Wagner, 2006; Humphreys, Wen-Li, Cadden, 2011) accordingly, two types Direct and Indirect development strategies were identified (Porch et al., 2016).

On the one hand, indirect strategies where the buying firm does not commit at all or limited resources only for specific suppliers. Indirect supplier development strategies include activities such as implementing competitive pressure, performance goal setting, supplier's operations evaluation, providing feedback (Krause, Calantone, Scannel, 2000; Wagner, 2010). Indirect activities motivate suppliers to put additional effort to aim the company's requirements and standards. On the other hand, direct supplier development that was explained in the previous classification, we will give examples that were not mentioned such as technical assistance, supplier site visit, education and training of the suppliers, and other alternatives of investment (Wagner and Jonson, 2004). Implementing direct strategy brings about risk because of commitment. There threat of opportunistic behavior of the supplier side (Wagner, 2006) as far as active buyer's firm investment increase buyer-supplier dependence.

Basic/Moderate/Advanced development strategies

Sanchez-Rodriguez et al. (2005) analyzed the third type of development approach in his study: basic, moderate and advanced. It is a process related approach where

strategies implementing consistently. Firstly, the basic strategy should be implemented as a tool for relationship improvement, this construct characterized by minimal investment and lower buyer firm's involvement. The moderate practice contains moderate resource using and involvement of the firm to the supplier's internal operations. The latest strategy is advanced where the highest involvement and level of resource investments, this supply development program carry out in cooperation and collaboration atmosphere. The author state that advanced strategy provides the greatest supplier improvement and developed capabilities (Sanchez-Rodriguez et al., 2005). This classification is not mutually exclusive because may occur at the same time as far as the buyer could communicate with few suppliers simultaneously.

Although the literature identified the variety of supplier development strategies, they are not fixed and should be strongly followed by companies. Supplier development strategy is a combination of identified development activities implemented following success factors and process represented in the last part of the chapter.

4. Developing segmentation framework for case company

This chapter is the essence of the study. Based on the literature review and current suppliers' analysis segmentation framework for the case study will be proposed with segments, boundaries and evaluation criteria. Suppliers and material portfolio analysis will be conducted in the first paragraph of this chapter (4.1.). Finally, the implementation recommendations (road map) for the case company will be provided and the potential impact will be determined.

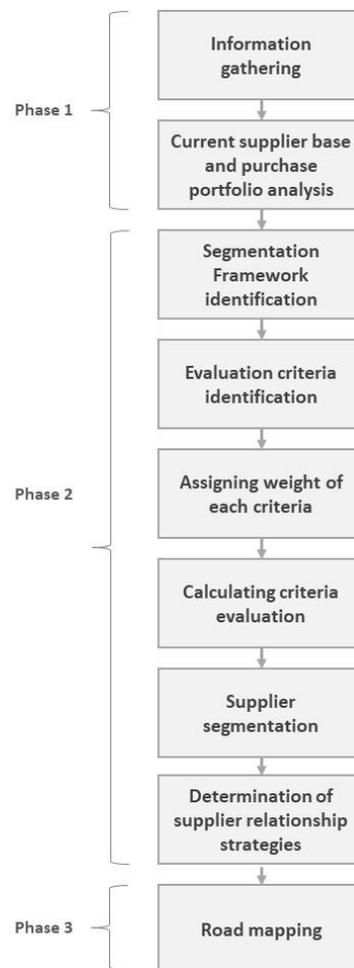


Figure 15. Segmentation framework development stages

The structure of the chapter corresponds with supplier segmentation framework development steps. This structure depicted in the Figure 15 bellow.

4.1. Background information about case company

As was mentioned in the second paragraph case company has more than 350 suppliers and there is no formed procedure for purchasing process or supplier selection and evaluation. There is no difference in managing suppliers except for contract requirements. Meanwhile, the assortment is diverse, there are items with completely different characteristics such as simple products that could be easily purchased from the market and at the same time, there are customized objects that should be produced by suppliers.

According to supply specialist interview the decisions are typically based on his own knowledge and previous experience with suppliers. *I have in my head which suppliers are preferable and I made decision by myself without any clear supplier selection structure. (Supplier specialist) Most of the information is only in my head, there is no requirements to purchase process. There is one goal to deliver the needed items on time.* After specialist decided the potential suitable suppliers for the order request for proposals were sent.

Financial director emphasized the irregular financial flows and cost efficiency issues. *There is no supplier assessing activities conducted by supply department. We as a financial function should be confident in efficiency of spending but the current situation does not allow to do that. (Financial Director)* Management of the company realizes that the company needs to develop a more strategic and integrated framework to work with the supplier base. The company wants to build a more transparent supplier selection process and to know how to manage the suppliers and what the supplier could become trusted partners. *I have requested more people involved in strategically valuable purchases decisions to diversify the risks and share the responsibility of this decisions not only in supplier specialist hands. Especially with*

customized products more holistic view is significantly important in selection phase such as engineers' expertise. (Project Manager)

Supplier specialist is concerned that the company does not pay enough attention to the important suppliers. *I, as a specialist conducting the meetings with top management of our important suppliers, as we are important clients for some of them. Meanwhile no one from our side on the high level ever tell the suppliers how valuable they are.* What is important to mention that there is no clear understanding in the case company which items are “*strategically valuable purchases*” and who are “*important suppliers*”.

Also, the prioritizing and segmentation was emphasized. *Each supplier is different and we need to get the best out of everything. I need to distinguish which suppliers I need to put more time and coordinate closely and what suppliers could be managed in a standard way. (Supplier specialist 2)* Today there is no difference between managing small volume suppliers and several million contracts suppliers.

Supplier evaluation is not conducted on a regular basis. There is one regular assessment conducting by financial department, the evaluation is only from the cost perspective. *Once I was analyzing the group of suppliers providing substitutes upon the director request of any statistics.*

The company has diversified activities and cost structure with decentrilized spending centers, moreover, the specialists during the interview (Financial department and Procurement department) mentioned the situation when the financial department have no opportunity to pay promptly the unplanned and unexpected amount (regular consumables and urgent purchase).

Interviews detect case company demand to develop sourcing segmentation framework and recommendations on how to operate with different suppliers.

4.2. Purchasing portfolio analysis

Only by understanding current supplier base characteristics and purchasing items portfolio relevant criteria for segmentation framework could be defined. To do this company's expert was interviewed. Segmentation framework suitable for the case company will be a hybrid of presented in previous chapters approaches.

The case company has four completely different purchased items groups: (1) Incidental procurement; (2) Regular consumables; (3) Promo from partners; (4) Industrial design suppliers. The share of the procurement type according to supplier numbers is depicted on Figure 16. The characteristic of each type is unique so the purchasing process, segmentation criteria and supplier relations strategies should be defined for each group.

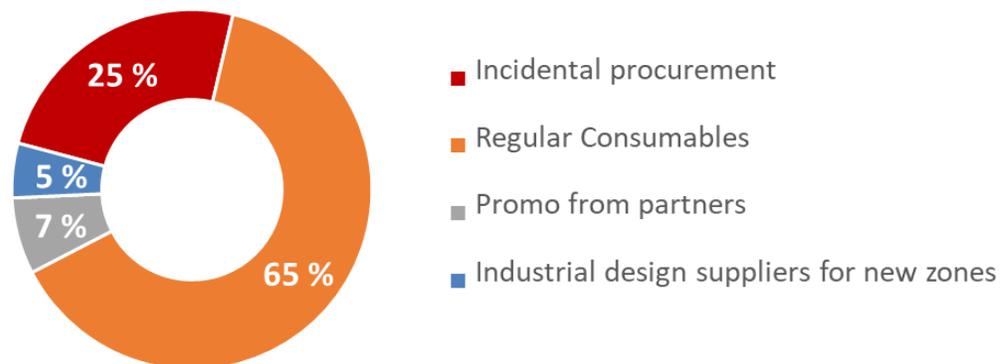


Figure 16. Case company purchasing types

Regular consumables (2) and promo from partners (3) are characterized as a regular assortment with regular demand. Consumables have almost fixed assortment that can be updated twice a year. This group includes the largest number of suppliers of the company. The main issue of this group is the suppliers' power because of the purchase volume. It results in a number of alternative suppliers to provide a continuous supply. Promo products that provided by our partners are unique case.

The supply and delivery conditions usually agreed during the partnership contract negotiation process and without any supply specialist. The conditions might be different for each partner. The purchasing specialist has no opportunity to change these conditions or suppliers.

Incidental procurement (1) and industrial design (4) are the unpredictable purchases. Incidental purchases mainly occur due to customized events. The difficulty of the purchasing of this type is rigid time restrictions and typically new items that take more time to find and select the suppliers. But the items itself are generally simple and easy to purchase. The industrial design group is the most time-consuming and costly group. These purchases are the most difficult because of customized products generally customized engineering machinery. The sourcing process for this group takes the longest time about 4-6 months. Closely the process will be presented in paragraph 4.6. Company has 7-10 suppliers to send a request for proposal (RFP).

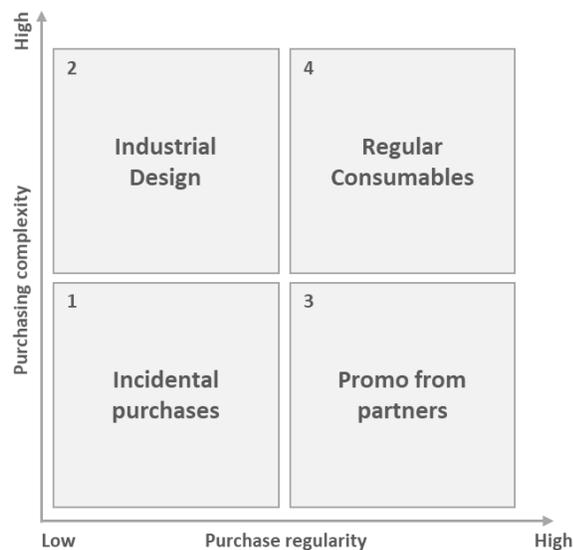


Figure 17. Case company material portfolio matrix

All the purchases items could be allocated into two dimensions matrix: Purchasing regularity and Complexity (Figure 17). Based on portfolio matrix dimensions appropriate ones for the case company were defined. As there is no need to classify and evaluate single time suppliers in incidental purchases and partners provided the promo, further supplier segmentation framework is developed only for industrial design type. Appendix 1 provided more detailed description of items' characteristics.

4.3. Current supply base analysis

The current supplier base should be analyzed to develop an effective segmentation framework, supplier monitoring system and the right relationship strategy. In this paragraph we discuss the amount of the suppliers and the way they are managed by purchasers.

According to the interview there are a plenty of suppliers and the process of selecting them is different and depends on the situation. For example, if the specialist is too busy because of an increasing number of orders from the park or in high season (school vacation, public holidays, etc.) the decision will be made in favor of the last supplier or supplier that suggested the shortest lead time. Another problem is that almost all the suppliers are found in a rush when the park was just open, and no one is analyzing their performance and conduct the benchmarking. There is no KPI or performance evaluation system in the department to encourage purchasers. The primary analysis shows opportunities to cut down the costs and find a more effective way to manage current suppliers.

The company has an overall 350 suppliers, 20 of them working with the case company in a regular base. The company has no supplier relationship development activities and strategies actions are the same for all suppliers. The supplier base is not organized, there are just several different documents and some of the suppliers are not entered in any document. The only master data for the supplier base is purchasers.

For our analysis all the suppliers were aggregated in one document, a few orders, prices, contracting states as it is the only information documented. Information access is the factor that affected the developing methods. Open information allowed to conduct a cost analysis. The analysis depicted that the majority of purchases were managed without contracts with buying company. Four out of fourteen regular consumables suppliers work without the contract (28,5%). The reason is a small amount of purchases for regular contracting. And fast changes of the consumables.

Table 7. Suppliers regular number of orders

| Supplier on regular | Number of orders | Share of Orders (%) | Contract |
|---------------------|------------------|---------------------|----------|
| Supplier A | 41 | 5% | Yes |
| Supplier Q | 29 | 3% | No |
| Supplier X | 26 | 3% | No |
| Supplier B | 26 | 3% | No |
| Supplier D | 24 | 3% | Yes |
| Supplier C | 17 | 2% | No |
| Supplier M | 16 | 2% | No |
| Supplier W | 16 | 2% | No |
| Supplier D | 15 | 2% | Yes |
| Supplier G | 15 | 2% | No |
| Supplier I | 15 | 2% | No |
| Supplier F | 17 | 2% | Yes |
| Supplier S | 15 | 2% | No |
| Supplier J | 19 | 2% | No |

Frequency, amount and product characteristics of the suppliers are different, which makes the analysis of the supplier base before segmentation complicated. In the following paragraph the adopted segmentation approach is proposed. The first step for the case company lies in developing effective sourcing after the segmentation

framework will be confirmed is the proper data collection that will allow evaluating performance.

4.4. Segmantation framework

Based on previous chapters new segmentation framework for case company was defined with segments and boundaries, and suppliers' relations strategies. The segmentation framework will include all the relevant criteria that will be evaluated to allocating suppliers in relative segments. The best way to implement effective concept is by arranging a dialogue while conducting a workshop with stakeholders in the company. So in this study there will be provided recommendations based on one related workshop, further it should be a series of them to validate the framework.

Recent studies criticize the purchasing portfolio matrix (PPM) and refocused on the new supplier potential matrix (SPM) as the methods that cover all the relevant variables. The supplier potential matrix is based on capabilities and willingness dimensions presented above. While Kraljic's purchasing portfolio focuses on *supply*, the potential approach focuses on *relations*. For the case company it is important to consider both aspects. There are suppliers from the industrial design where the relations between the case company and suppliers are essential. A framework that developed for the case company is a combination of two approaches. This combination approach was presented by Rezaei and called the PPM-SPM matrix and shown in Figure 18.

With combined framework suppliers from one group could be divided and managed in four different ways, according to their potential (willingness and capabilities). On Figure 18 proposed for the case company approach is visualized. Each quadrant from the portfolio matrix is segmented into four groups where LC and HC are low and high capability relatively, LW and HW are low and high willingness relatively.

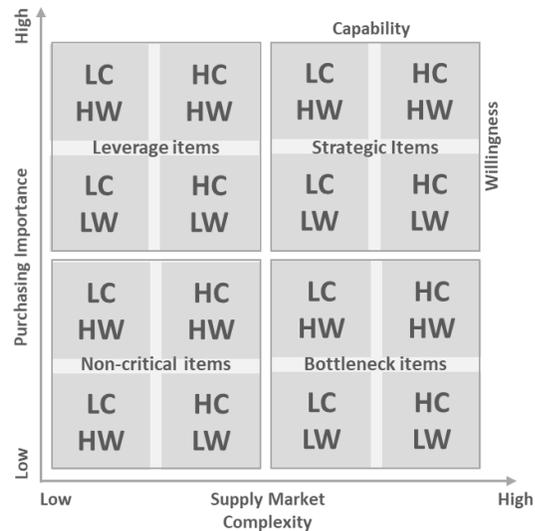


Figure 18. Combined PPM-SPM approach (Rezaei, 2018)

The combination approach allows to evaluate suppliers by taking into consideration variables from each concept. Firstly, a set of criteria for each dimension should be identified and evaluated. After that, all the scores should be aggregated under each dimension. In the next section criteria for the case company are identified.

4.5. Identifying supplier segmentation criteria

To identify the relevant criteria questionnaire was prepared and the decision-makers were asked to fill in. The initial list of proposed criteria was defined from the factors provided by literature and discussed in section 3.4.1. Respondents were asked to pick the relevant criteria place into one of the given categories (capability, willingness, profit impact and supply risk). After criteria were selected decision group evaluate each of the suppliers according to criteria. List of the chosen criteria shown in the Table below.

The segmentation model will be applied to each purchasing group separately because of different items characteristics and different purchase types. Supplier segmentation criteria should different because of different goals and different

relations. As an example, in this section suppliers provided Industrial Design items evaluated.

Table 8. Selected criteria

| PPM | | SPM | |
|-----------------------------|---------------------------|---------------------------|---------------------------------|
| <i>Profit impact</i> | <i>Supply risk</i> | <i>Willingness</i> | <i>Capabilities</i> |
| Total amount | Geographical location | Commitment | Management and organization |
| Payment arrangements | Delivery time | Information openness | Expertise |
| Product price | After sale support | Effective communication | Performance history |
| | Quality | Long term relations | Delivery/Implementation in time |
| | Previous experience | Adaptability | Collaboration |

It is important to mention that before sending questionnaires to responders first workshop was arranged. During this workshop the proposed framework was introduced. The meaning of every proposed criterion and way how the data is going to be used was explained to the decision-makers. This step was significantly important to be sure that everyone was on the same page and have an equal understanding of the terms.

4.6. Criteria evaluation and agregation phase

After the criteria for dimensions were identified, the evaluation of each characteristic was conducted by structured questions that were sent to decision-makers. The result was determined values of each criterion that will help to get a final score and allocate the suppliers into the segmentation matrix.

Respondents were asked to estimate a weighting to each criterion from section 4.4. according to their perception of the relative criteria's importance. Decision-makers had 25 points to evaluate *Supply Risk*, *Willingness* and *Capabilities* dimensions and

15 points to allocate *Profit impact*. The average score was five points. In the section below the aggregated results of the qualitative data presented. The results of characteristics' weighting are summarized in Tables 10, 12 and 13. In Table 9 and 11 the results of respondents questioning are represented.

Portfolio performance

Results of *supply risk* criteria evaluation show that the highest scores 5,80 received Quality of the supplying items and Previous experience of the supplier that lost only 0,02 points. The lowest score was received by characteristic Geographical location. This parameter was chosen among the initial pool of variables but get the lowest score from experts. Delivery time get a higher score than After-sale support which received a score below the average 4,60 points.

Table 9. Purchasing portfolio Supply risk dimension criteria evaluating results

| Role | Supply Risk | | | | |
|----------------------|-----------------------|---------------|--------------------|-------------|---------------------|
| | Geographical location | Delivery time | After sale support | Quality | Previous experience |
| Supply Specialist 1 | 4,49 | 4.9 | 4.43 | 5.63 | 5,55 |
| Supply Specialist 2 | 3.76 | 5.03 | 4.10 | 5.75 | 6.45 |
| Product Manager | 4.03 | 5.00 | 6.02 | 4.25 | 5.70 |
| Engineer | 2.60 | 4.75 | 4.20 | 6.45 | 7.00 |
| Financial Controller | 3.00 | 7.00 | 3.10 | 6.25 | 5.65 |
| CEO | 4.33 | 4.33 | 5.76 | 6.45 | 4.35 |
| Total | 3.69 | 5.13 | 4.60 | 5.80 | 5.78 |
| | C_{s1} | C_{s2} | C_{s3} | C_{s4} | C_{s5} |
| Weighting | 0.147 | 0.205 | 0.184 | 0.232 | 0.231 |

Total weighting results of supply risk dimension are presented in the bottom of Table 9. Looking at the scores given by employees they varied which indicates the differences of the company's experts view.

The same process of weighting was conducted with Profit impact dimensions from the portfolio concept and both dimensions of Supply potential part. The results of the Potential impact are presented at the Table 10. Variation of Profit impact between the lowest and the highest scores is bigger. Product price and Payment arrangements more relevant for the case company than the total purchased amount. Payment arrangements are the purchasing and payment conditions provided by suppliers.

Table 10. Purchasing portfolio Profit impact dimension criteria evaluating results

| Role | Profit Impact | | |
|----------------------|------------------------|----------------------|---------------|
| | Purchased total amount | Payment arrangements | Product Price |
| Supply Specialist 1 | 3.80 | 5.20 | 6.00 |
| Supply Specialist 2 | 2.81 | 6.32 | 5.78 |
| Product Manager | 4.50 | 3.80 | 6.70 |
| Engineer | 4.47 | 5.21 | 5.32 |
| Financial Controller | 2.50 | 6.10 | 6.40 |
| CEO | 2.90 | 6.65 | 5.45 |
| Total | 3.50 | 5.55 | 5.96 |
| | C_{P1} | C_{P2} | C_{P3} |
| Weighting | 0.224 | 0.365 | 0.411 |

The weights of Capability and Willingness variables were aggregated the same way. In table below the results are shown (Table 11).

Table 11. Capabilities and willingness criteria weights

| Capabilities weight | Management and organization | Expertise | Performance history | Delivery/Implementation in time | Collaboration |
|---------------------|-----------------------------|----------------------|-------------------------|---------------------------------|---------------|
| | C_{C1} | C_{C2} | C_{C3} | C_{C4} | C_{C5} |
| | 0.183 | 0.215 | 0.203 | 0.247 | 0.152 |
| Willingness weight | Commitment | Information openness | Effective communication | Long term relations | Adaptability |
| | C_{W1} | C_{W2} | C_{W3} | C_{W4} | C_{W5} |
| | 0.245 | 0.234 | 0.174 | 0.152 | 0.195 |

As it is shown in Table 9 Quality and Previous experience are the most important criterion followed by Delivery time and After sales support regarding supply risk dimension. Geographical location is the least important. For the Profit impact, Product price is the most important criterion, after Payment arrangements.

Table 11 summaries supply relations criteria and Delivery and Implementation lead time receive the highest score as the most important characteristic, suppliers' expertise and performance history become the next most important criteria. Management and collaboration were evaluated by employees as the least important regarding capabilities. Suppliers' commitment and willingness to share the information and knowledge received the highest scores in the willingness dimension. Long term relations were evaluated as the least important characteristic.

The weighting of the different characteristics was used together with the scoring system to map each supplier in the relative segment. The next step of the segmentation model is evaluating suppliers according to criteria and allocating into the relative segments.

Table 12. PPM grades calculation

| Role | Supply Risk | | | | | | Profit Impact | | | |
|---------------|-------------|----------|----------|----------|----------|-------|---------------|----------|----------|-------|
| | C_{s1} | C_{s2} | C_{s3} | C_{s4} | C_{s5} | Total | C_{p1} | C_{p2} | C_{p3} | Total |
| Weight | 0.147 | 0.205 | 0.184 | 0.232 | 0.231 | | 0.224 | 0.365 | 0.411 | |
| S1 | 1 | 3 | 4 | 4 | 5 | 3.73 | 2 | 4 | 5 | 3.96 |
| S2 | 4 | 5 | 5 | 2 | 3 | 3,69 | 1 | 5 | 5 | 4.10 |
| S3 | 1 | 1 | 4 | 4 | 5 | 3.76 | 2 | 3 | 3 | 2.78 |
| S4 | 5 | 4 | 2 | 4 | 2 | 3.31 | 4 | 2 | 2 | 2.45 |
| S5 | 4 | 5 | 4 | 3 | 1 | 3.28 | 5 | 1 | 2 | 2.31 |
| S6 | 3 | 4 | 5 | 2 | 2 | 3.80 | 5 | 4 | 5 | 4.64 |
| S7 | 4 | 5 | 5 | 4 | 5 | 4.62 | 1 | 3 | 4 | 2.96 |
| S8 | 1 | 1 | 5 | 4 | 2 | 2.66 | 1 | 4 | 4 | 3.33 |
| S9 | 5 | 5 | 3 | 3 | 4 | 3.93 | 3 | 5 | 5 | 4.55 |
| S10 | 3 | 2 | 2 | 5 | 4 | 3.30 | 0 | 4 | 5 | 3.52 |
| S11 | 4 | 2 | 4 | 5 | 1 | 3.13 | 3 | 3 | 5 | 3.82 |
| S12 | 4 | 3 | 3 | 3 | 2 | 2.91 | 4 | 3 | 4 | 3.64 |
| S13 | 5 | 3 | 5 | 5 | 4 | 4,35 | 4 | 2 | 2 | 2.45 |

| | | | | | | | | | | |
|-----|---|---|---|---|---|------|---|---|---|------|
| S14 | 5 | 2 | 4 | 4 | 4 | 3.73 | 2 | 1 | 4 | 2.46 |
|-----|---|---|---|---|---|------|---|---|---|------|

Because the company did not keep any statistics we have no quantitative data. The evaluation was made by experts during the two hours workshop. As an example, in the study, we represent the result of segmentation one of the four supplier group (Industrial Design) that were identified in section 4.2. The group includes 14 suppliers. Purchasing items could be characterized as a piece of complex technological machinery with a long supply period including production, implementation and after-sales support. Table 14 shows the supplier segmentation based on the PPM model.

According to the scores from Table 14 suppliers were allocated in a matrix, presented in Figure 19. As can be seen, almost all the suppliers are allocated in the Strategic (PPM4) segment which comes from items characteristics. But there are four suppliers which allocated in PPM3 (Improvement) segments with lower profit impact to the case company.

During the workshop name of the PPM segments were agreed, for better users understanding:

- Maintenance - PPM1 (low supply risk and low profit impact) 0 suppliers
- Collaboration - PPM2 (low supply risk and high profit impact) 0 suppliers
- Improvement - PPM3 (high supply risk and low profit impact) 4 suppliers
- Prime - PPM4 (high supply risk and high profit impact) 10 suppliers

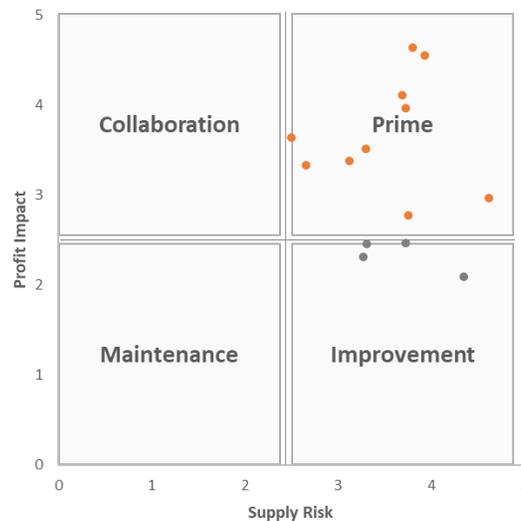


Figure 19. Industrial design suppliers' allocation according PPM model

The next step of the segmentation is calculating the capabilities and willingness scores of each supplier in the group. The results are presented in the Table 13 below.

Table 13. SPM grades calculation

| Role | Capabilities | | | | | | Willingness | | | | | |
|---------------|--------------|----------|----------|----------|----------|--------|-------------|----------|----------|----------|----------|--------|
| | C_{C1} | C_{C2} | C_{C3} | C_{C4} | C_{C5} | Tot al | C_{W1} | C_{W2} | C_{W3} | C_{W4} | C_{W5} | Tot al |
| Weight | 0.183 | 0,215 | 0.203 | 0.247 | 0.152 | | 0.245 | 0.234 | 0.174 | 0.152 | 0.195 | |
| S1 | 0 | 1 | 2 | 2 | 4 | 1,72 | 5 | 5 | 2 | 3 | 1 | 3,39 |
| S2 | 0 | 3 | 5 | 2 | 4 | 2,81 | 2 | 1 | 1 | 3 | 1 | 1,55 |
| S3 | 2 | 1 | 1 | 5 | 4 | 2,63 | 1 | 3 | 2 | 2 | 4 | 2,38 |
| S4 | 1 | 2 | 3 | 4 | 5 | 2,97 | 3 | 5 | 1 | 3 | 4 | 3,31 |
| S5 | 2 | 2 | 1 | 3 | 1 | 1,89 | 5 | 1 | 1 | 0 | 1 | 1,83 |
| S6 | 5 | 3 | 3 | 1 | 4 | 3,02 | 1 | 0 | 4 | 2 | 5 | 2,22 |
| S7 | 4 | 3 | 5 | 2 | 1 | 3,04 | 3 | 1 | 3 | 4 | 2 | 2,49 |
| S8 | 2 | 3 | 2 | 2 | 3 | 2,37 | 2 | 1 | 5 | 3 | 1 | 2,25 |
| S9 | 1 | 2 | 2 | 5 | 3 | 2,71 | 0 | 0 | 1 | 5 | 0 | 0,94 |
| S10 | 1 | 5 | 2 | 1 | 2 | 2,22 | 0 | 3 | 1 | 5 | 3 | 2,34 |
| S11 | 3 | 1 | 0 | 1 | 2 | 1,32 | 2 | 2 | 1 | 0 | 2 | 1,52 |
| S12 | 3 | 3 | 5 | 3 | 4 | 3,56 | 1 | 5 | 3 | 2 | 2 | 2,63 |
| S13 | 5 | 2 | 2 | 4 | 5 | 3,50 | 5 | 1 | 5 | 1 | 5 | 3,45 |
| S14 | 0 | 1 | 3 | 5 | 5 | 2,82 | 2 | 2 | 3 | 4 | 3 | 2,67 |

Figure 20 shows the visual result of allocating all fourteen suppliers into the SPM matrix. As can be seen regarding the second approach, vast of the suppliers concentrated in the center of the matrix. Although twelve out of 14 suppliers distributed equally 4 suppliers each.

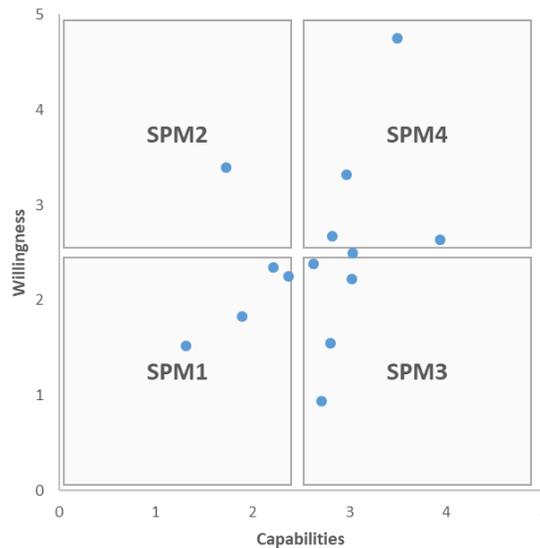


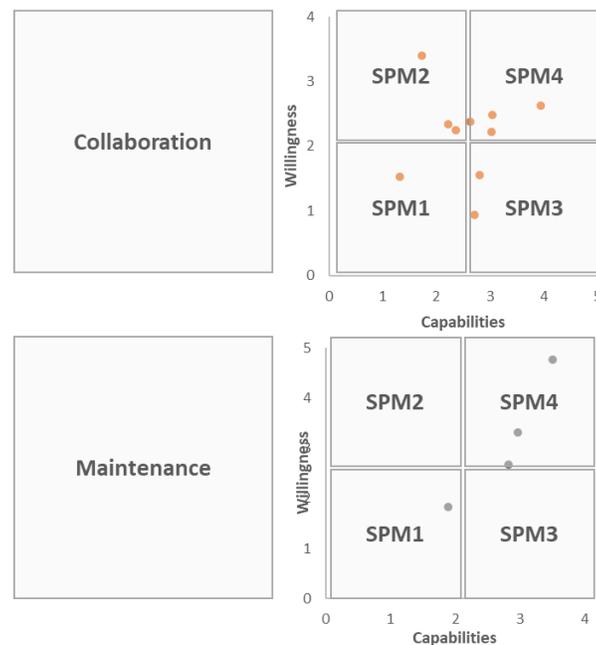
Figure 20. Industrial design suppliers' allocation according SPM model

The final step of the segmentation process is calculating combined scores. The table below shows the quantitative results. These results were represented at Figure 21 where all fourteen suppliers of the Industrial Design group were segmented by a combined PPM-SPM segmentation framework.

Table 15. Combined model calculation

| Weight | Supply Risk | Profit Impact | PPM Segment | Capabilities | Willingness | Capabilities level | Willingness level | SPM Segment |
|--------|-------------|---------------|-------------|--------------|-------------|--------------------|-------------------|-------------|
| S1 | 3,73 | 3,96 | PPM4 | 1,72 | 3,39 | LC | HW | SPM2 |
| S2 | 3,69 | 4,10 | PPM4 | 2,81 | 1,55 | HC | LW | SPM3 |
| S3 | 3,76 | 2,78 | PPM4 | 2,63 | 2,38 | HC | LW | SPM3 |
| S4 | 3,31 | 2,45 | PPM1 | 2,97 | 3,31 | HC | HW | SPM4 |
| S5 | 3,28 | 2,31 | PPM1 | 1,89 | 1,83 | LC | LW | SMP1 |
| S6 | 3,80 | 4,64 | PPM4 | 3,02 | 2,22 | HC | LW | SPM3 |
| S7 | 4,62 | 2,96 | PPM4 | 3,04 | 2,49 | HC | LW | SPM3 |
| S8 | 2,66 | 3,33 | PPM4 | 2,37 | 2,25 | LC | LW | SMP1 |
| S9 | 3,93 | 4,55 | PPM4 | 2,71 | 0,94 | HC | LW | SPM3 |
| S10 | 3,30 | 3,52 | PPM4 | 2,22 | 2,34 | LC | LW | SMP1 |
| S11 | 3,13 | 3,37 | PPM4 | 1,32 | 1,52 | LC | LW | SMP1 |
| S12 | 2,50 | 3,64 | PPM4 | 3,94 | 2,63 | HC | HW | SPM4 |
| S13 | 4,35 | 2,08 | PPM1 | 3,50 | 4,76 | HC | HW | SPM4 |
| S14 | 3,73 | 2,46 | PPM1 | 2,82 | 2,67 | HC | HW | SPM4 |

All the suppliers from the Industrial design group end up in two PPM quadrants Strategic and Bottle-neck according to Kraljic and Prime and Improvement according to case company agreed on terms. Supplier from Improvement segment and SPM1 segment with low capabilities and low willingness have to be analyzed closely by purchasers and further managing model should be developed and agreed. Following the same process of segmentation could be done for the other three purchase



groups.

Figure 21. Industrial design suppliers' segmentation combined PPM-SPM model

The combined approach allows to get insights and manage suppliers' relations relatively to get better results and performance. Having several suppliers' segments lead to different buyer-supplier relations and the next step after the segmentation model was developed and suppliers were evaluated is deciding how each category of suppliers has to be managed. This subject is discussed in the next section.

In the next section, the definition, policies and objectives of each segment are introduced. Provided descriptions of what suppliers with which characteristics could be in that segment and what type of relations should be. Applying the results of

suppliers' segmentation are discussed in the next paragraph with the implementation instructions for the case company.

4.7. Developing supplier relationship management approach

Building buyer-supplier relationships are one of the key functions for procurement specialists but in the case company it is not. Because of the supplier base was historically formed there are no supplier management activities. After supplier segmentation phase it is possible to develop an individual supplier management approach. The strategies should consider both supply and relationship dimensions.

Prime Supplier Segment

Prime suppliers' segment is for key suppliers big enough, who can deliver high-quality products, have enough resources to cover regular demand and capabilities to develop communication. Long term relations and developing close collaboration is a key in those segments. Supplier from that segments should be ready to share the information and be deeply involved into the purchasing process. Items from this segment have a significant profit impact and characterized by a high level of risk.

Establishment of regular deliveries in time is a critical characteristic for the suppliers but mostly for Regular consumables suppliers while for the Industrial Design suppliers are crucial to creating effective communication and information sharing environment. Increasing integration is the overall goal for the segment.

Improvement Segment

Suppliers from the Improvement segment have a high potential. In the case company as shown in Figure 21 suppliers from this quadrant have a high level of capabilities and high willingness. These suppliers could deliver bigger volume products and provide flexible conditions. Objectives of suppliers from that quadrant are maintaining good relationships and possibly to elaborate on it. One of the suitable development strategies is incentives. A case company could engage suppliers for smaller contracts on short-term projects as the supply risk is high.

Collaboration Segment

Suppliers from collaboration segments are characterized by high-profit impact and low supply risk. From industrial design items it could be the general contractor for building up the zone because on one hand, this part is the most expensive and costly part of the project but on the other - general contractor could not be changed and it is a trusted company with minimum supply risks. The main objectives of managing this kind of suppliers are building strong relationships and maintain mutual trust. The number of meetings could be minimum once-twice a year to discuss the conditions and contract prolongation.

Maintenance Segment

Maintenance segment includes both low-profit impact and supply risk. For the case company in these segments should be allocated suppliers of regular consumables as a standard product provider. These items are cheap and easy to find substitutes on the market and replace suppliers. The main objective in this segment is to maintain the critical number of the suppliers to have an opportunity to choose the best price conditions. A development strategy that should be used is competitive strategies. The case company should develop a standard procedure of supplier selection and purchasing process for these items to minimize the lead time. The pool of the maintenance segment suppliers should be evaluated regularly.

Maintaining a strategic partnership is a general strategy for this segment. Capabilities and willingness level help to formulate management strategies more accurate.

Suppliers from the SPM4 segment with high capabilities and high willingness are the best ones. Buyers should not be worried because suppliers are making great impact on the profit and have both capabilities and willingness to work with the case company. The company should focus on building strong relations, use and develop the concept.

Suppliers from the SPM3 segment with high capabilities and low willingness are valuable for buyers. The company should try to improve suppliers through trust-building and long-term commitment strategies.

Suppliers from the SPM2 segment with high willingness and low capabilities are the most reliable ones because of readiness to collaborate. Development is the best strategy for this group, buyers could support the growth of suppliers and its' capabilities. On the other hand, limits of suppliers' capabilities could result in a situation where the company has to replace them. Such as in a case where three suppliers are allocated in this segment and two of them have higher capabilities but the lower willingness and one of the suppliers have the highest willingness but only two-point of capabilities.

Suppliers from SPM1 segment with low capabilities and low willingness that located in Prime segment are weak spot for the case company. Because of the high level of profit impact and supply risk, these suppliers jeopardize the ongoing process. Replacement is one of the strategies for that quadrant. If the suppliers could not be replaced the buying company should provide regular feedback and evaluation sessions.

For Regular consumables multiply sourcing from different suppliers will give 12% economy, on the other hand, the contract with Supplier 5 will give the 10% cost reduction and stable partnership with the average size player with more than 6 years' experience on the market. The similar actions realized for the rest of the nomenclature and approximately 5-6% could be reduced. But supplier specialist should on regular basis analyze the market and conduct the similar tender of update the supplier base on a regular consumable.

*On the other hand, for the **Industrial design suppliers for new zones type** of purchasing the supplier relationship and supplier development operation are essential. The companies have to build a partnership with high level of information sharing, level of trust; and high level of mutual planning and coordination; continues*

control through the projects. This factor allows to minimize the potential hazards that could turn to additional expense.

4.8. Implementation

Current reactive procurement process results in inefficient decisions when purchasers have no time to follow the selection procedures and make in order from random supplier with the lowest price and fastest lead time, sometimes suppliers have no history that put the company into a risk. It is essential for the company to separate the suppliers and implement a different process of supplier relationship management for each of the group and supplier segment. Identified Suppliers types in suppliers' analysis section and conducted segmentation framework led to establishing specific sourcing strategies mentioned in the previous section that will lead to developing the strong relations with each of the group.

Implementation of the segmentation model in case company needs time and could not be presented at a full-scale in the Thesis. In this section successive steps of the implementation are provided with a short explanation of each. These steps are shown in Figure 22 below.

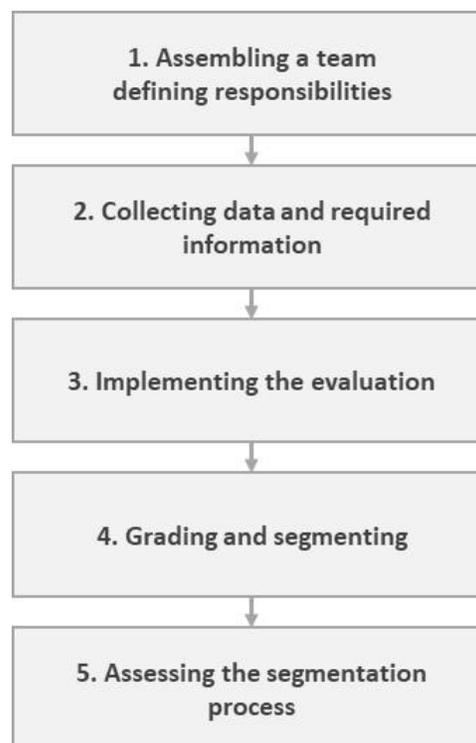


Figure 22. Implementation steps

The steps are almost the same as the framework development stages that were identified at the beginning of the fourth paragraph. Some of the stages are unified and two new stages were added: defining the team and evaluating the segmentation process itself.

The process of applying evaluation and supplier's development strategies should be done with involvement of all the employees of the case company who are related to the sourcing process. A person who purchases and has access to the required information should be the main responsible of the project. Onboarding meeting with the team, project goals and timing should be arranged where top management has to be involved.

Collection of the part of the required data has already been done during the study. As an additional information, case company supplier should be interviewed to get feedback and insights. Moreover, it is important to get feedback from internal final users who make the orders inside.

The main responsibility for the evaluation should prepare and provide all the evaluation materials: questionnaires, instructions on how to evaluate, evaluation tables, grading guidelines. The grading system should be simple enough so that users and respondents were able to easily fill in the forms and interpret the results. The grading system should consider different types of criteria and make all of the comparable. The optimal number of respondents should be decided to get a wider range of opinions on one hand and to do not make the process of evaluation to a complex on another. Besides, knowledge-based evaluation should contain a statistical base to reduce subjectivity. To do that parameters and indicators should be chosen by decision-makers.

After the evaluation stage suppliers will be placed on the segmentation framework based on total points, the example of arranging suppliers shown in Figure 21. The updated conceptual supply chain after supplier segmentation is presented on Appendix 2. The segmentation process could be organized in excel where suppliers' coordinates will be found automatically after entering scores, aggregation and

multiplying with weighting coefficients. Chart of suppliers' allocation could change dynamically.

The final stage is the evaluation of the segmentation process considering if the approach provided expected results. The main concept should be openness, the way of conducting evaluation could be either an anonymous questionnaire or open dialog with all the stakeholders. This stage is important to understand does the current segmentation framework is suitable for the company.

The overall process of implementation should be slowly made step-by-step. Stakeholders including suppliers should be engaged in the process. The supplier segmentation framework is not strictly unchangeable, it should be flexible, adaptable and develop by iterative agility approach.

Suggestions of key performance metrics for Supply Chain and Purchasing department estimation.

As it was mentioned case company has no KPI for supply management. Bellow are given some recommended metrics that will help the case company to keep the process under the control.

Supplier team effectiveness:

- Share of suppliers with contracts (%)
- Share of contracts with post payment (%)
- Cost optimization rate (%)
- Order lead time (days)
- Internal rejections after payment (%)

These metrics allow for controlling critical issues of the process: inter-organization communication with owners and financial department; unappropriated orders with overvalued needed and prioritization that led to higher costs

5. Conclusion

A number of unstructured supplier base with different characteristics were the main reason for that study. Due to the fact that purchase items are completely different with different characteristics and different purchasing process, the lack of planning and forecasting in the case company as well as reactive sourcing style result in pricing and delivery of time-oriented decisions. Many different suppliers make it difficult to prioritize and evaluate the supplier base. The lack of efficiency of any evaluation system of supply function creates disincentives for employees to change that situation. This thesis provides an approach with tools for the case company to manage the wide supplier base. The developed framework gives an opportunity to provide instructions for each supplier. Following the recommendations would allow to increase the performance effectiveness and the quality of the cooperation. Clear management policies and the systematic management of suppliers enable better assessment among suppliers.

The main issues related to suppliers' management and development were defined. In the case company, where a considerable number of suppliers provided different items and services, it can be difficult to make the right decisions when time is limited. However, when suppliers are segmented according to their abilities it is easier to select a proper supplier with certain capabilities. For the case company, unorganized supplier base resulted in delivery delays and product quality issues that tainted the image.

The steps to be taken based on the thesis are the following recommendations of implementing. These guidelines should be followed after the required data was gathered and cross-functional workshops was arranged. Recently, there has not been sufficient data enough to consider all the factors. The suggested variables should be tested after all the required information is collected before the supplier segmentation is executed. Variables can be modified by the company in case the evaluation cannot provide enough variation between suppliers. Suppliers objectives and management

instructions should not conflict with the segment, otherwise, it has to be modified. Answers to the research questions raised in the first paragraph are as follows:

RQ1. How to develop Supplier Management strategies?

Developing a supplier management strategy should, first, take into consideration the company's corporate strategy and, second, be based on certain supply process requirements and limitations. Supplied items characteristics, on the one hand, and specific industry and business elements on the other should be a baseline of a company's supplier management. A supplier management strategy could not be created and executed in isolation, and as any other strategy should be integrated into the general company's strategy structure.

RQ2. What is the efficient supplier managing framework for the case company?

Supplier segmentation is one of the possible ways to systematically allocate the unorganized supplier base and manage suppliers according to their segments. Segmentation could be based on various factors: resources, financial aspects, supplied products' characteristics, suppliers' potential and abilities. The suggested framework is a combination of resource and supplier relation-based concepts. Supplier management policies and supplier development strategies should be developed according to suppliers' segments.

RQ3. How should the suppliers of the case company with different characteristics and purchased items be managed?

In the case company, supplier specialists had no differentiation in managing suppliers that provided consumables for the park on regular basis, suppliers that provided high technological machines and suppliers that provided a one-time use product. The supplier management strategy, which was developed, based on dividing the supplier pool in segments, where each one of them had equal characteristics. This segmentation considered both supplier potential and special aspects of purchased items. Suppliers of each segment have their objectives, roles and supplier development strategy. The variety of criteria covered by the suggested framework allows the case company to take decisions faster and more properly.

6. Summary

Today, procurement professionals have a huge opportunity to make a powerful impact on business performance. The business contribution expectations for procurement professionals are increasing. The right approach for development of a system and selecting supply strategies can be a key advantage in this competitive environment. The management of companies is increasing their expectations on the contribution of effective supply chain to the company's performance. An interest and attention to supply processes is enhanced not only by business, but also by the scientific community. Various approaches, hypotheses and information systems are being developed that allow optimizing processes, increasing accuracy and speed.

In this Thesis, the problem of constructing an efficient and sustainable supply management strategy was attempted to be solved. As an example, the company which provides services in the field of edutainment was chosen and analyzed. The main strategic components of the supply system were examined, as well as recent concepts of supplier segmentation and supplier development were studied to apply them for the case company. A qualitative analysis of the company, including the detailed analysis of the external environment and players in the market has made it possible to distinguish the company's competitive advantages. Internal analysis of the company, existing processes, organizational and technical solutions allowed to identify the main supply problems and potential for improvement. Based on the data obtained and the existing limitations of the system, the approach was developed and a list of tools, the application of which provides reliability and reduces current risks of the supply process. Given recommendations make it possible to release financial resources and increase the stability of the system, considering the organization as a complex system. One of the main advantages of the work is the universality of the recommendations. The proposed approaches can be implemented in other locations, which are currently 24 across different countries. Although the suggestions were provided for the case company, they can be applicable to other business models as well.

Appendix 1

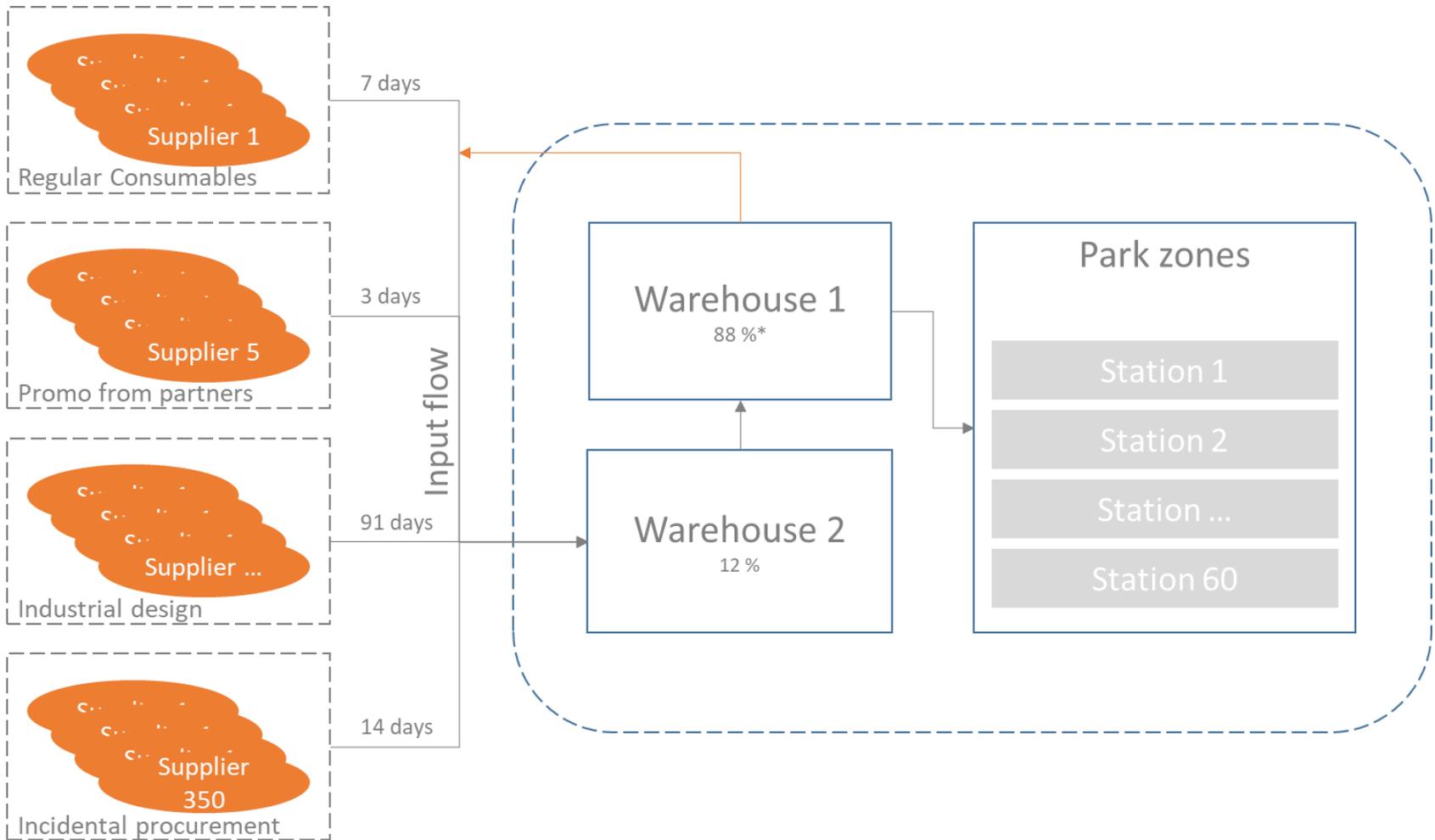
Case company items profile

| Parameters | Consumables type | | | | |
|--|---|---|--|--|--|
| | Promo partners from | Regular Consumables | Collaterals | Industrial design suppliers for new zones | Incidental procurement |
| Product characteristic | Identified items; agreed regular demand | Make to stock; Big list of items; The items are appearing and removing out of the list; The quantity is quite small for big suppliers and contracts; | Make to order; Big amounts orders are preferred for economy of scale; Long turnover period; Space consuming; Rare orders; | Engineering to order; One-time order; Complex product with equipment and programming; Aftersales service needed; Difficult to estimate the price; | Could be both make to stock and make to order product; Urgent delivery needed; |
| Demand characteristic | Stable | Volatile and seasonal demand; | Stable | Unpredictable | Unpredictable |
| Supplier characteristic | Dominant | Big supplier base; without any engagements (no contracts); | Clients' market; Company who interested in small and stable demand; Short lead time; | Just a few suppliers on the market; | Depends on the product characteristic |
| Time to make supplier selection | No needed | Short reorder period; 1-2 days maximum | Average reorder period; 5-7 day; | Strategic orders and tender take 3-6 weeks | 2-3 days |
| Communication | Regular monthly communication to make an order; Making mutual plan delivery schedule; | Communication to make an order or request for proposal; Communication to arrange the documents; Arrange the delivery process; | Communication to make an order or request for proposal; Communication to arrange the documents; Arrange the delivery process; | Regular communication during the contract period; Closely mutual work with regular control from the buyer; Cole communication after sale; | Minimum communication: require of proposal; agreed the price and delivery time; documentation arrangement; |
| Competitive pressure | No needed | Needed | Needed | Needed | No needed |
| Supplier outcomes | Regular evaluation report | Information should be conducted regular to make an analysis and future selection; | Information should be conducted regular to make an analysis and future selection; | Assessing the suppliers' work and ask feedback from them to improve the future projects; | No needed |

| Parameters | Consumables type | | | | |
|----------------------------|--------------------|---|---|--|---|
| | Promo partners | from Regular Consumables | Collaterals | Industrial design suppliers for new zones | Incidental procurement |
| Selection procedure | No needed | One-year tender for developing supplier base; Multiparameter regular tender; Period agreement for supply; | Selecting 3-5 key suppliers; Price for stable regular items should be fixed for period; Incidental purchase through multiparameter tender (1-2 days); | Long-term tender with a lot of technical description documents; Several sessions with the potential suppliers; multiparameter selection; | Short tender; the price and delivery time as the key decision criteria. |
| Strategy | Partnership | Market Transactional | Hybrid Relational | Hierarchy Investment | Market Transactional |

Appendix 2

Modified company supply chain



References

- Benoît, C., & Vickery-Niederman, G. (2010). Social sustainability assessment literature review. The Sustainability Consortium.
- Bensaou, M. (1999). Portfolios of buyer-supplier relationships. *MIT Sloan Management Review*, 40(4), 35.
- Bhutta, K. S., & Huq, F. (2002). Supplier selection problem: a comparison of the total cost of ownership and analytic hierarchy process approaches. *Supply Chain Management: an international journal*, 7(3), 126-135.
- Blomqvist, K., Kyläheiko, K., & Virolainen, V. M. (2002). Filling a gap in traditional transaction cost economics: Towards transaction benefits-based analysis. *International Journal of Production Economics*, 79(1), 1-14.
- Burke, G. J., Carrillo, J. E., & Vakharia, A. J. (2007). Single versus multiple supplier sourcing strategies. *European journal of operational research*, 182(1), 95-112.
- Caniels, M. C., & Gelderman, C. J. (2005). Purchasing strategies in the Kraljic matrix—A power and dependence perspective. *Journal of purchasing and supply management*, 11(2-3), 141-155.
- Carr, A. S., & Smeltzer, L. R. (1997). An empirically based operational definition of strategic purchasing. *European Journal of Purchasing & Supply Management*, 3(4), 199-207.
- Choi, T. Y., & Hartley, J. L. (1996). An exploration of supplier selection practices across the supply chain. *Journal of operations management*, 14(4), 333-343.
- Chopra, S. & Meindl, P., 2010. *Supply Chain Management - Strategy, Planning and Operation*. New Jersey: Pearson Education.
- Choy, K. L., Lee, W., & Lo, V. (2003). Design of a case based intelligent supplier relationship management system—the integration of supplier rating system and product coding system. *Expert Systems with Applications*, 25(1), 87-100.

- Cox, A. (2001). The power perspective in procurement and supply management. *Journal of Supply Chain Management*, 37(2), 4.
- De Boer, L., Labro, E., & Morlacchi, P. (2001). A review of methods supporting supplier selection. *European journal of purchasing & supply management*, 7(2), 75-89.
- Deshmukh, Ashish J., and Archana A. Chaudhari. "A review for supplier selection criteria and methods." In *technology systems and management*, pp. 283-291. Springer, Berlin, Heidelberg, 2011.
- Dickson, G. W. (1966). An analysis of vendor selection systems and decisions. *Journal of purchasing*, 2(1), 5-17.
- Dubois, A., & Pedersen, A. C. (2002). Why relationships do not fit into purchasing portfolio models—a comparison between the portfolio and industrial network approaches. *European Journal of Purchasing & Supply Management*, 8(1), 35-42.
- Dyer, J. H., Cho, D. S., & Cgu, W. (1998). Strategic supplier segmentation: The next "best practice" in supply chain management. *California management review*, 40(2), 57-77.
- G. Burke, A. Vakharia (2004). *Supply Chain Management*, The Internet Encyclopedia Wiley, New York
- Gadde, L. E., & Håkansson, H. (1993). *Professional purchasing*. Routledge.
- Govindan, K., Rajendran, S., Sarkis, J., & Murugesan, P. (2015). Multi criteria decision making approaches for green supplier evaluation and selection: a literature review. *Journal of Cleaner Production*, 98, 66-83.
- Gordon Murray, J. (2000). Effects of a green purchasing strategy: the case of Belfast City Council. *Supply Chain Management: An International Journal*, 5(1), 37-44.

- Hallikas, J., Puumalainen, K., Vesterinen, T., & Virolainen, V. M. (2005). Risk-based classification of supplier relationships. *Journal of Purchasing and Supply Management*, 11(2-3), 72-82.
- Handfield, R., Walton, S. V., Sroufe, R., & Melnyk, S. A. (2002). Applying environmental criteria to supplier assessment: A study in the application of the Analytical Hierarchy Process. *European journal of operational research*, 141(1), 70-87.
- Hartley, J. L., & Choi, T. Y. (1996). Supplier development: customers as a catalyst of process change. *Business Horizons*, 39(4), 37-44.
- Hartley, J. L., & Jones, G. E. (1997). Process oriented supplier development: building the capability for change. *International journal of purchasing and materials management*, 33(2), 24-29.
- Klassen, R. D., & Vereecke, A. (2012). Social issues in supply chains: Capabilities link responsibility, risk (opportunity), and performance. *International Journal of Production Economics*, 140(1), 103-115.
- Kraljic, P. (1983). Purchasing must become supply management. *Harvard business review*, 61(5), 109-117.
- Krause, D.R. (1997) 'Supplier development: current practices and outcomes', *International Journal of Purchasing and Materials Management*, Vol. 33, No. 2, pp.12–19.
- Krause, D.R., Scannell, T.V. and Calantone, R.J. (2000) 'A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance', *Decision Sciences*, Vol. 31, No. 1, pp.33–54.
- Kumar, A., & Jain, V. (2010, October). Supplier selection: a green approach with carbon footprint monitoring. In *Supply Chain Management and Information Systems (SCMIS), 2010 8th International Conference on* (pp. 1-8). IEEE.

- Kumar, N., Scheer, L. K., & Steenkamp, J. B. E. (1995). The effects of perceived interdependence on dealer attitudes. *Journal of marketing research*, 32(3), 348-356.
- Liker, J. K., & Choi, T. Y. (2004). Building deep supplier relationships. *Harvard business review*, 82(12), 104-113.
- Lintukangas, K. (2011) 'Supplier relationship management capability in global supply management', *International Journal of Procurement Management*, Vol. 4, No. 1, pp.1–19.
- Luzzini, D., Caniato, F., Ronchi, S., & Spina, G. (2012). A transaction costs approach to purchasing portfolio management. *International Journal of Operations & Production Management*, 32(9), 1015-1042.
- Mandal, A., & Deshmukh, S. G. (1994). Vendor selection using interpretive structural modelling (ISM). *International Journal of Operations & Production Management*, 14(6), 52-59. management on environmental performance outcomes. In *Environmentally Conscious Manufacturing IV* (Vol. 5583, pp. 94-106). International Society for Optics and Photonics.
- Maloni, M.; Benton, W. C. (2000): Power influence in the supply chain, in: *Journal of Business Logistics*, Vol. 21, 1, p. 49-73.
- Masella, C., & Rangone, A. (2000). A contingent approach to the design of vendor selection systems for different types of co-operative customer/supplier relationships. *International Journal of Operations & Production Management*, 20(1), 70-84.
- Michael Tracey, Chong Leng Tan, (2001) "Empirical analysis of supplier selection and involvement, customer satisfaction, and firm performance", *Supply Chain Management: An International Journal*, Vol. 6 Issue: 4, pp.174-188
- Min, H. (1994). International supplier selection: a multi-attribute utility approach. *International Journal of Physical Distribution & Logistics Management*, 24(5), 24-33.

- Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L. (2015). *Purchasing and supply chain management*. Cengage Learning.
- Monczka, R. M., Trent, R. J., & Callahan, T. J. (1993). Supply base strategies to maximize supplier performance. *International Journal of Physical Distribution & Logistics Management*, 23(4), 42-54.
- Mortensen, M., & Arlbjørn, J. (2012). Inter-organisational supplier development: the case of customer attractiveness and strategic fit. *Supply Chain Management: An International Journal*, 17(2), 152-171.
- Munda, G. (2005). Multiple criteria decision analysis and sustainable development. In *Multiple criteria decision analysis: State of the art surveys* (pp. 953-986). Springer, New York, NY.
- Ng, W. L. (2008). An efficient and simple model for multiple criteria supplier selection problem. *European journal of operational research*, 186(3), 1059-1067.
- Olsen, R. F., & Ellram, L. M. (1997). Buyer-supplier relationships: alternative research approaches. *European Journal of Purchasing & Supply Management*, 3(4), 221-231.
- Pagell, M., Wu, Z., & Wasserman, M. E. (2010). Thinking differently about purchasing portfolios: an assessment of sustainable sourcing. *Journal of supply chain management*, 46(1), 57-73.
- Parasuraman, A. (1980). Vendor segmentation: An additional level of market segmentation. *Industrial Marketing Management*, 9(1), 59-62.
- Park, J., Shin, K., Chang, T. W., & Park, J. (2010). An integrative framework for supplier relationship management. *Industrial Management & Data Systems*, 110(4), 495-515.
- Porter, M. E. (1996). *What is strategy*. Published November.

- Ramasesh, R. V., Ord, J. K., Hayya, J. C., & Pan, A. (1991). Sole versus dual sourcing in stochastic lead-time (s, Q) inventory models. *Management science*, 37(4), 428-443.
- Ravindran, A. R., & Warsing, D. P. (2013). Supplier selection models and methods. *Supply Chain Engineering: Models and Applications*, 293-362.
- Ravindran, A. R., & Wadhwa, V. (2009). Multiple Criteria Optimization Models for Supplier Selection. *the Handbook of Military Industrial Engineering*, Badiru, A. and Thomas, M.(Editors), CRC Press, Boca Raton, FL.
- Rezaei, J., & Fallah Lajimi, H. (2018). Segmenting supplies and suppliers: bringing together the purchasing portfolio matrix and the supplier potential matrix. *International Journal of Logistics Research and Applications*, 1-18.
- Rezaei, J., & Ortt, R. (2012). A multi-variable approach to supplier segmentation. *International Journal of Production Research*, 50(16), 4593-4611.
- Sanayei, A., Mousavi, S. F., Abdi, M. R., & Mohaghar, A. (2008). An integrated group decision-making process for supplier selection and order allocation using multi-attribute utility theory and linear programming. *Journal of the Franklin institute*, 345(7), 731-747.
- Seuring, S. (2013). A review of modeling approaches for sustainable supply chain management. *Decision support systems*, 54(4), 1513-1520.
- Sharafi, Z., & Parvizian, J. (2011, December). Supplier development: a decision-making problem. In *Industrial Engineering and Engineering Management (IEEM), 2011 IEEE International Conference on* (pp. 1199-1203). IEEE.
- Svensson, G. (2004). Supplier segmentation in the automotive industry: A dyadic approach of a managerial model. *International Journal of Physical Distribution & Logistics Management*, 34(1), 12-38.

- Talluri, S., Narasimhan, R., & Chung, W. (2010). Manufacturer cooperation in supplier development under risk. *European Journal of Operational Research*, 207(1), 165-173.
- Tate, W. L., Ellram, L. M., & Carter, C. R. (2004, December). The impact of supply
- Tuten, T. L., & Urban, D. J. (2001). An expanded model of business-to-business partnership formation and success. *Industrial marketing management*, 30(2), 149-164.
- Van Weele, A. J. (2010). *Purchasing and supply chain management: Analysis, strategy, planning and practice*. Cengage Learning EMEA.
- Virolainen, V. M. (1998). A survey of procurement strategy development in industrial companies. *International Journal of Production Economics*, 56, 677-688.
- Vokurka, R. J., Choobineh, J., & Vadi, L. (1996). A prototype expert system for the evaluation and selection of potential suppliers. *International Journal of Operations & Production Management*, 16(12), 106-127.
- Weber, C. A., Current, J. R., & Benton, W. C. (1991). Vendor selection criteria and methods. *European journal of operational research*, 50(1), 2-18.
- Wynstra, F., & Ten Pierick, E. (2000). Managing supplier involvement in new product development: a portfolio approach. *European Journal of Purchasing & Supply Management*, 6(1), 49-57.
- Hendrick, T. E., & Ellram, L. M. (1993). *Strategic supplier partnering: An international study*. Center for Advanced Purchasing Studies.
- Ho, W., Xu, X., & Dey, P. K. (2010). Multi-criteria decision-making approaches for supplier evaluation and selection: A literature review. *European Journal of operational research*, 202(1), 16-24.
- Hong, G. H., Park, S. C., Jang, D. S., & Rho, H. M. (2005). An effective supplier selection method for constructing a competitive supply-relationship. *Expert Systems with Applications*, 28(4), 629-639.

Hudnurkar, M., Rathod, U., & Jakhar, S. K. (2016). Multi-criteria decision framework for supplier classification in collaborative supply chains: Buyer's perspective. *International Journal of Productivity and Performance Management*, 65(5), 622-640.

Humphreys, P. K., Wong, Y. K., & Chan, F. T. S. (2003). Integrating environmental criteria into the supplier selection process. *Journal of Materials processing technology*, 138(1-3), 349-356.

Yildiz, A., & Yayla, A. Y. (2015). Multi-criteria decision-making methods for supplier selection: A literature review. *South African Journal of Industrial Engineering*, 26(2), 158-177.

Surinov A. (2017). *Russian Statistical Yearbook 2017: Stat .book/Rosstat*, 84 – 192.

Web references

<http://www.iaapa.org/docs/default-source/iaapa-europe/iaapa-europe-economic-impact-study-2014.pdf>

<https://rg.ru/2018/02/08/reg-szfo/nazvany-samye-populiarnye-u-turistov-goroda-rossii.html>

[http:// www.gks.ru](http://www.gks.ru)

<https://finance.rambler.ru/markets>