

The Objective Segmentation Process of Supplier or Product Groups Using the Kraljic Matrix

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Abstract:

Background and originality: Contemporary purchasing employs methods and procedures that comprehensively enhances the competitive advantages of the organisation with their strategically oriented management. The first step in the process of designing an efficient purchasing strategy is the segmentation of suppliers or product groups according to the method Kraljic Matrix. Assuming that different situations require different activities and that the process of segmentation of suppliers or product groups is subjectively oriented, we conclude that the result of generalised segmentation leads to passive purchasing behaviour. From this point of view, we have developed a scientific research question: "What actually is an effective objective segmentation process of suppliers or product groups"? The main objective is to gain an understanding of the Kraljic Matrix and the segmentation process and to obtain key guidelines for developing an effective and objective segmentation process.

Method: In the first part of this scientific investigation, the existing literature on the topic Kraljic Matrix is studied in order to gain an understanding of the segmentation process of suppliers or product groups. In continuation, selected experts are interviewed to give their opinion on this topic and discuss the implementation of the Kraljic Matrix in practice. In a final step, we used a qualitative thematic network analysis tool based on the scope of the literature reviewed and the interviews conducted with three experts.

Results: The results show the process of developing a thematic network based on the literature reviewed and a case study of the objective segmentation process of suppliers or product groups using semi-structured interviews.

Society: Society as a whole is gaining a common organisational understanding that encompasses concepts such as sustainability, environment, society, culture, and progress. The indirect impact on the organisation is seen in lower purchase prices, a reduction in overall costs, a reduction in supply chain risk and significant innovations in the supply market.

Limitations / further research: This research is limited to the cited literature sources and a small number of interview participants. We recommend continuing the research by examining a broader range of existing literature and conducting a fully structured interview with a larger and/or homogeneous group of respondents.

Keywords: strategy, purchase function, Kraljic Matrix, segmentation, suppliers, product groups.

1 Introduction

Nowadays, organisations are forced to adapt to the rapid changes in market conditions and increase their competitiveness. Therefore, the role of purchasing is becoming more and more important. In addition to cost management and purchasing activities, they focus on cooperation with other organisational functions, management of the supply market and ultimately on objectives that represent the greatest added value for the success of the organisation.

The strategically oriented purchasing function requires active collaboration with all other functions inside and outside the organisation to manage suppliers, trends, technologies, and other key inputs. Older strategies that involve proactively "copy-pasting" outdated models, using repetitive levers, and generalising situations reduce the function's efficiency and, consequently, the organization's overall competitiveness. Contemporary purchasing strategy requires appropriate segmentation of suppliers or product groups to select the most appropriate strategy and leverage.

Several authors, e.g. Vörösmarty and Dobos (2019, p. 20), recommend the Kraljic Matrix as the most appropriate tool for segmenting suppliers or purchasing groups. They recognize the advantages of this matrix, which requires only basic mathematical knowledge and provides relatively quick results. The process of segmenting suppliers or product groups depends mainly on the subjective understanding of the matrix, the categorization process and the understanding of the supply market. The result of generalized segmentation leads to repetitive purchasing strategies and a narrower selection of purchasing levers and passive challenges.

In this research, an effective objective process of segmenting groups of suppliers or products is researched and demonstrated. The purpose was to find an effective way to classify suppliers or product groups into the Kraljic Matrix, not subjectively, but with precise segmentation. In the first part of the scientific study, the existing literature on supplier or purchasing group segmentation is reviewed. The scientific study will be continued by interviewing a selected population of professionals in strategic management of procurement functions from different industries in Slovenia, which will help us to gain an understanding of the use and implementation of the Kraljic Matrix in practice. In the next part, a qualitative analytical study of the reviewed literature and semi-structured interviews using the thematic network tool will be conducted. The aim of the latter series of studies is to master the identification of a structured and objective segmentation of product groups.

The results of the study serve as a guide for identifying processes to automate the identification of suppliers or purchasing groups using soft logic and/or the use of Artificial Intelligence. Vörösmarty and Dobos, (2019, p. 23) state that in supplier selection processes, the critical criteria must be carefully selected in the initial stages of the process to achieve effective results. The aim of this study is to develop a design that reduces the customer's subjective influence on automated system tools, thus providing an effective approach to strategy implementation activities..

2 Theoretical approach

In the past, purchasing focused on lowering purchase prices, and therefore preference was given to the cheapest supplier. Nowadays, the purchasing function focuses on many other factors and is firmly embedded in other functions within the organization and outside the purchasing market. Patel (2018) stated that small businesses should follow the larger businesses by planning and utilizing available resources, building a business structure, gaining experiential knowledge, understanding the market and industry, evaluating the purchasing situation, and carefully managing relationships with suppliers to ensure their growth. In this way, small businesses can overcome challenges such as low bargaining power in interactions and limited resources (pp. 24-25).

In recent years, buyers have become aware of the importance of meeting the needs and requirements of key suppliers in order to become a preferred buyer and thus gain a competitive advantage. Karuppusamy and Chidambaram (2019) write that enterprises today are innovating less and less on their own and are increasingly bringing in external innovation organisations or StartUp organisations. The reason for external involvement is that more and more innovations are the result of combined knowledge and technologies. Suppliers must continue to deliver products to buyers, but at the same time be aware of the importance of sharing technologies and innovations (p. 3).

Moreover, the authors refer to the individual handling of different situations, from which it is evident that even two cases are not the same. Mello, Eckhardt, and Leiras (2017, p. 5) write in their research that the main strategy defined by the organization should be in the foreground, but in addition they propose a parallel purchasing strategy as a pillar of quality, cost management, security of supply, flexibility and innovation. Trautrim, MacCarthy, and Okade (2017) emphasize the importance of aligning the purchasing and innovation strategy with the overall organizational strategy. In functions where innovation is critical, integration with innovative suppliers is paramount, and this capability of the purchasing function provides the organization with a competitive advantage (p. 5).

The status of the supplier or the product group and its categorization to determine leverage in the implementation of the purchasing strategy is increasingly reflected in modern purchasing concepts. Rachman, (2019, p. 226) mentions the implementation of the process of categorization or grouping of purchasing elements into groups in the development of the purchasing strategy. The basic tool for classifying products in the organisation is the analysis of needs with data sources from internal ERP (Enterprise Resource Planning). In order to ensure supply, the enterprise (buyer) introduces additional suppliers in parallel with the originally agreed supplier. In this case, we no longer speak of the suppliers, but of the product groups. Lisan (2018) mentions the importance of categorization of purchasing materials because in some categories we have two suppliers that have leverage to reduce prices and in other categories we have two suppliers to ensure supply. Purchasing decisions take into account the requirements of internal stakeholders and suppliers that affect the implementation of the final

product. The process of strategy development in the initial stage requires proper categorization of suppliers or purchasing groups. The forces in the dimensions of the supply market vary according to the extent of supply and demand (p. 2).

Another dimension that should be considered when classifying purchasing groups is the classification of the purchasing market into oligopolistic or monopolistic supply behaviour. To the above dimensions may be added the dimensions of buyer power and supplier power which are listed in parallel. Dabhilkar, Bengtsson, and Lakemond (2016) state that there is a power difference between suppliers and buyers resulting from their interdependence (pp. 18-21).

For the management of purchasing strategies, the so-called Kraljic Matrix method is generally used to categorize suppliers or purchasing groups. Dr Peter Kraljic introduced the matrix in a 1983 article published in Harvard Business Review, in which he clearly presented the classification of suppliers or purchasing groups into the following dimensions:

- **Supply risk** with entry barrier factors, market conditions (monopoly/oligopoly), technological innovation,
- **Profit impact** is an influencing factor that affects the supplier or product group influence factor on the enterprise profitability (p. 111)

Vörösmarty and Dobos (2019, p. 19), assess the applicability of the Kraljic method, which classifies purchasing groups into four categories depending on the strategic importance and complexity of the purchasing market. Brüning M. (2018, p. 6) says that each quadrant can be optimally exploited by different purchasing tactics. Patel (2018) presents the applicability of the Kraljic Matrix for each purchasing situation. In the "**leverage**" category, relevant activities include leveraging the buyer's purchasing power, finding the optimal cost position, and/or developing a strategic partnership. In categories where the strengths of the buyer and supplier are equal, i.e., the so-called "**non-critical**" and "**strategic**" categories, it is necessary to cultivate a strategic partnership with the supplier. The "**bottleneck**" category describes purchasing materials to which we attribute a higher degree of power on the part of the supplier, so we try to move these materials into other categories, non-critical or even better, leverage materials (p. 11).

Rezaei and Lajimi (2019, p. 433) developed a supplier segmentation model with sixteen categories, including the dimensions of impact on profit and risk in supply, as well as the dimensions of supplier's ability to supply and willingness to cooperate, in order to choose an appropriate strategy.

In practice, we recognize the versatile use of the Kraljic Matrix, which managers adapt depending on the appropriateness in each particular situation. Grimaldi and Yudoko (2019) reversed the categories of leverage of materials and bottlenecks, implying that supply risk and profit impact are inversely related.

Kraljic wrote (1983, p. 110) "from purchasing to supply management" (from purchasing as an operational function to supply management as a strategic function). Strategic thinking can create new opportunities and also protect some organizational vulnerabilities.

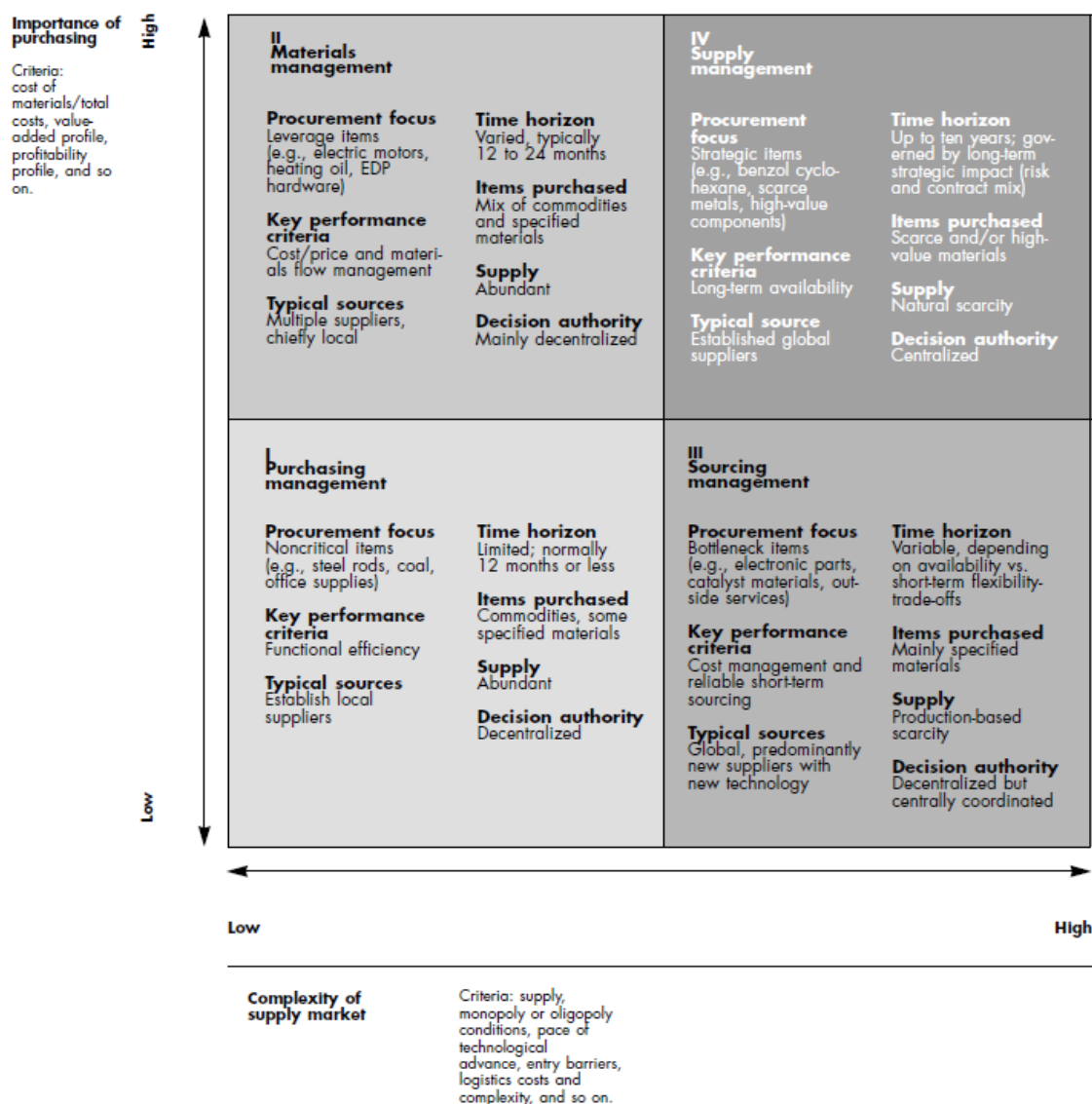


Figure 1. Kraljic Matrix

The Kraljic Matrix (Figure 1) is a model of categorizing suppliers or purchasing groups along two dimensions, supply risk and profit impact. The dimensions determine the four quadrants of categorization of purchasing materials, namely: leverage materials, strategic materials, bottleneck materials and non-critical materials. Categorization is the process of classifying purchasing materials into categories that relate to different levels of importance.

Brüning M. (2018, p. 5) writes that the supply risk dimension classifies suppliers into low or high risk. Low risk means that more suppliers and buyers have a strong position in the market. High supply risk, on the other hand, means that there are only a few suppliers and power shifts to the supplier side. Shlopak, Rød, and Oterhals (2016, p. 2) add that supply risk is also assessed in terms of the availability of a supply item, the extent of competing demand, the possibilities

for self-supply (production or purchase), the extent of inventory risks and the possibilities for possible substitutes.

Pritandari Suliantoro , and Sari (2018) write that in the category of "**strategic**" materials are groups of purchasing materials with high supply risk. These products are offered by only a few or a few suppliers and require a high development effort for the buyer. Due to the high supply risk and high purchasing value, strategic materials are given the highest priority when choosing the right supply strategy. Material groups in the strategic material quadrant are expected to have only one supplier. The selected suppliers are also expected to be highly qualified, flexible and loyal to meet all the requirements of the buyer. It is recommended that the enterprise (the buyer) enters into a partnership with the supplier with a long-term contract that depends on the buyer's strategy. The goal of a partnership is to achieve a high level of trust and commitment so that the buyer can influence the supplier to mitigate potential risks. The group of elements in the strategic quadrant can be moved to the leverage materials quadrant through the tools of partnership relationships, reducing supply risk, and finding additional sources of supply through a thorough search and analysis of the purchase market (p. 4).

Munter (2019) believes that the "**bottleneck**" category of material purchasing is the most complex for buyers to understand. Their purchasing risk is high, while the profit impact on the enterprise is rather low. The fundamental task here is to shift materials to other quadrants that are either non-critical or have leverage. The risks of this group are mitigated by ensuring supply and vendor control, implementing safety stock and planning for alternatives. Risks must be assessed and mitigated by working with suppliers and negotiating a long-term business relationship. The risk must be thoroughly analysed to identify mitigation opportunities (p. 37).

The category of "**non-critical**" materials includes items for which we identify a low impact on the risk supply dimension and, at the same time, a negligible impact on the financial gain dimension. Rachman (2019, p. 226) writes that this category is characterized by low supply risk and low financial impact, so they are typically products with a variety of suppliers, simple technologies, and low prices. Noncritical items have product characteristics that are standardized in the marketplace. Relationships with multiple suppliers can add complexity and variability to the process, so managing multiple suppliers is a risk. The buyer does not need to partner with suppliers because building partnerships requires a large and difficult management effort. This group is characterized by annual contracts with the possibility of recall of goods. Activities are recommended to bring a group of materials into the leverage quadrant (p. 5).

The category of "**leverage**" materials defines elements for which we find a small impact on the dimension of the risk supply dimension and at the same time a large impact on financial gain. Pritandari, Suliantoro, and Sari (2018, p. 5) describe a category with high financial consumption value and low supply risk. Brüning (2018) also writes that there are many suppliers in the leveraged materials category, but the strategic impact of the material is greater than in the non-critical items group. Appropriate tactics for leveraging buyer power include selecting the right

supplier, leveraging competitiveness, and a combination of contractual and incidental purchases (p. 6).

Patel (2018) writes that the matrix also suggests different methods for each situation. The organisation should look at leverage materials by leveraging purchasing power and also look for savings in developing strategic partnerships. Similarly, for critical and strategic categories, he suggests maintaining a strategic partnership while spending as little time and effort as possible on non-critical components (p. 11).

In the literature review, we could not identify an objective process of supplier or product group segmentation in the Kraljic Matrix. As such, the following thesis was developed: T1: "There is no objective approach in practise". In academic research, we want to explore and demonstrate an effective objective process, and our research question "What actually is an effective objective supplier or product group segmentation process?" is based on this work. To find an effective way to classify suppliers or product groups into the Kraljic Matrix, not subjectively, with precise segmentation.

3 Method

A graphical representation of our research is shown Figure 2.

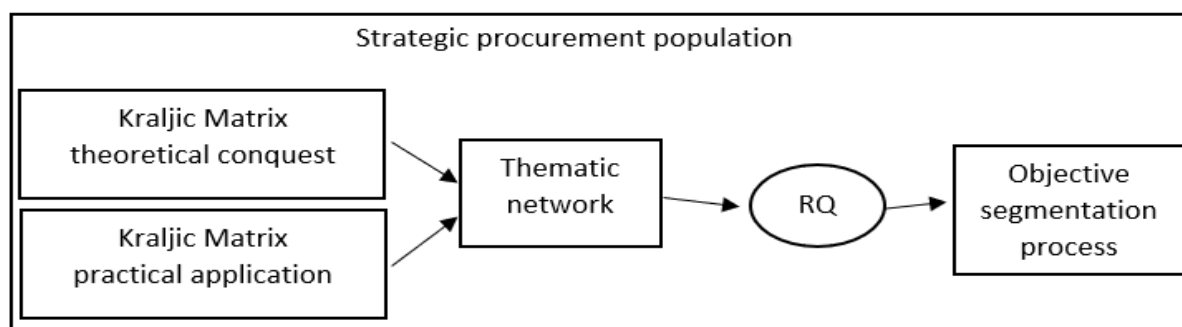


Figure 2. Research model

In a review (Figure 2) of the existing literature of 35 articles and books available in online collections (Google Scholar, ScienceDirect, ProQuest, and EBSCO), we identified 23 relevant scientific research papers. We excluded the articles that, according to our subjective assessment (our research keywords), did not add value in finding answers to our research problem. In the first part of the research, we examined the selected literature in terms of the characteristics belonging to a specific category on the Kraljic Matrix: Leverage Materials, Strategic Materials, Noncritical Materials, and Bottleneck Materials. Then we interviewed three individuals from a selected population, the strategic management of purchasing in different industries in Slovenia. Below is a description of the interviewees:

- Interviewee (A): Function: CPO in a private profitable organization, Education: MBA, Age: 52 years, 30 years of experience in purchasing, managing 19 employees.

- Interviewee (B): Function: CPO in a private profitable organization, Education: Master's Degree, Age: 48 years, 14 years of experience in purchasing, managing 61 employees.
- Interviewee (C): Function: Manager in a private profitable organization, Education: Bachelor's Degree, Age : 47 years, 11 years of experience in purchasing.

The first criterion for selecting interviewees was strategic purchasers operating in organizations ranked among the top 5 by Viršek, D. (2020, July 19). Our purpose was to obtain a comprehensive description of the characteristics that describe each category in the Kraljic Matrix. For the understanding and credibility of the questionnaire, we interviewed four people who work in purchasing. Therefore, we designed the following questions for the interview:

- (1) As it is your ongoing responsibility to develop purchasing strategies, what procedures do you use in developing purchasing strategies?
- (2) The Kraljic Matrix is a tool used to prepare a purchasing strategy. How often do you use it and how would you describe it?
- (3) In the categorization method, we assign product groups to their own category, namely: leverage materials, strategic materials, non-critical materials and bottlenecks. What do you think are the most important characteristics of each product group that define the category?

We emailed the interviewees and asked for their cooperation. After agreeing to the interview and coordinating schedules, we conducted the interview using the application MS TEAMS because of the current situation of spreading infections during the epidemic COVID -19 constraints. Before the interview, we conducted a 10-minute interview to explain the purpose of the interview and the scope of the topic. We began by warming up the topic and then moved on to an enjoyable interview that lasted about 30 minutes on average. Below are summaries of the interviews:

- (1) *As it is your ongoing responsibility to develop purchasing strategies, what procedures do you use in developing purchasing strategies?*

The following is a summary of Interviewee A:

We increasingly rely on up-to-date purchasing procedures, commercial analyses, market analysis calculations and the development of a strategy. Depending on the size of the product group, the strategy can be short and simple or more precise and complicated. In the latter case, we carry out SWOT, Porter analyses, the Kraljic Matrix and the like. We perform many procedures as a team, not only within the purchasing function, but also beyond, at the corporate level. The strategy proposal is approved within the purchasing department and then within the close circle of executives. We are always very transparent when developing scenarios and try to choose the most appropriate of the proposed options. From experience, I can say that we confirm the strategy that satisfies our internal customers because we have to sell the developed strategy internally (laughs). A strategy that is suitable is the strategy that satisfies all internal customers..

The following is a summary of Interviewee B:

We have developed our own strategy selection process and use it regularly. To implement the strategies, we use an application to which only selected employees have access. The application

provides insight into history, impact, reports and current implementations. I am very happy with this tool because I have the right information at my fingertips whenever I need it. In the application, the analysis tools are interconnected, including supplier evaluation, supplier benefits, risks, categorization with the Kraljic Matrix, ongoing projects, and I could go on and on. We regularly implement the strategies developed and measure the impact of those strategies in terms of savings compared to the previous strategies..

The following is a summary of Interviewee C:

We have no specific procedures for formulating strategies. Strategic managers have a free hand, and we want to enhance their creativity by not formalising all processes. Once the strategy is formulated and ready, we start implementing it. I realise that some of them are challenging and require more effort to design, so in these cases we use various universal tools such as Business Requirements, Supplier Preference and the Kraljic Matrix. We are a technically oriented organisation and I can say that the strategists' work is more outward looking than inward looking. We have long term partnerships with external partners and design strategies together. I can say that all strategies used follow the general guidelines of the organisation, which is most important for this part.

In the case of interviewee A, we can identify the purchasing function and, through its strategy development, a purchasing function as a support function for other functions in the organisation. Strategy development is systemic and like other interviewees they use the tool Kraljic Matrix. Interviewee B views strategy as a process and uses a design application that is only accessible to certain people in the organisation. Interviewee C represents a development-oriented organisation. The formulation of strategies there is aligned with the politics of the organisation and involves partners.

(2) The Kraljic Matrix is a tool used to prepare a purchasing strategy. How often do you use it and how would you describe it?

The following is a summary of Interviewee A:

We have been using the Kraljic Matrix for as long as I can remember, and all I can say is that it is a basic tool for categorizing purchasing groups or suppliers. When we first introduced the principle of working with product group management, we used this matrix to categorize all product groups. In subsequent years, we have found that the characteristics of product groups have changed, which means that what we once identified through the categorization process may be different today. As supplier SRM (Supplier Relationship Model) relationships change, so do the characteristics in the categorization. I would describe this matrix as a useful tool that is a basic requirement for a general view of product group management.

The following is a summary of Interviewee B:

We use them in the development of complex strategies to provide leverage to achieve the strategies' goals through categorization. For some product groups that require a quick and short "quick wins" approach that do not require a categorization process, we simply take what is offered to us. Our organisation is focused on resale, we do not have an in-house development department and we have contracts with suppliers that are structured towards commercial, i.e. business terms and supply conditions. The Kraljic Matrix is a useful tool in strategic purchasing functions for designing the complex purchasing strategies. I have been familiar with the tool in the past and still know it today. Let me say that I personally know Dr Peter Kraljic and I am proud of it. In 2016, we had external consultants from BCS (Boston Consulting Group) in the organisation, and in the training of our purchasing staff there was also a module for managing the Kraljic Matrix.

The following is a summary of Interviewee C:

This matrix-based categorization is used all the time in our organisation, mainly to move groups from left to right, so to speak (from the strategic materials and bottleneck categories to the leverage materials and non-critical materials categories). We work closely with development suppliers, the Start-Up organisation, and patent holders to purchase materials that require certain certifications. Once we win the product and meet the terms of the contract, we begin to move the purchasing groups into other categories. Based on the given characteristics of the purchasing group, we use the Kraljic Matrix mainly to determine the levers for implementing strategies.

Following is a sub-question: *Where do you draw ideas for creating leverage?*

We often work with the same organisations that know our behaviour, so we draw our creativity from AT Kearney's book *The Purchasing Chessboard*. We apply methods aimed at forming collaborations and partnerships and becoming independent in the subsequent phase by changing the technical specification, lowering the product price, adding value, changing technologies and much more.

It is interesting to note the statement of interviewee A, who states that the characteristics of the product groups change, from which we can conclude that the product groups move within Kraljic's matrix according to the changes in the economy. He describes the matrix as a useful tool that is a basic general tool for managing product groups when monitoring the progress of purchasing strategies. Interviewee B says that the matrix is a useful tool in strategic purchasing functions for formulating purchasing strategies and that the training of purchasing staff in his company was provided by BCG. Interesting information comes from the third interviewee C who mentions another consulting firm that competes with BCG, namely AT Kearney. Another particularly interesting finding is the organisation's awareness that it is developmental and that the role of the purchasing function is to redirect categories from the right quadrant to the left quadrant in order to reduce risk.

(3) In the categorization method, we assign product groups to their own category, namely: leverage materials, strategic materials, non-critical materials and bottlenecks. What do you think are the most important characteristics of each product group that define the category?

The following is a summary of interviewee A:

Our categorization process is fairly precise; we have four other subcategories within each category. Not everything is black or white; for example, the Leverage Materials group consists of product groups that have a large financial impact and are divided into materials that are widely available in the marketplace and those that require collaboration on development with the supplier. For the strategic materials category, I would highlight characteristics such as joint development and co-ownership, and they are characterised by cooperation. Here the most important is power equality or balance in cooperation between the buyer and the supplier. The group of bottleneck materials is similar, but it differs in the greater power of the supplier and consequently our little influence on the technical knowledge of the technology or profession, ownership and the like. I would describe the category of noncritical materials simply with the following characteristics: low influence on the purchasing function, the end customer and the mass supply.

The following is a summary of interviewee B:

In using the matrix, we classify commodity groups into the four categories mentioned above and do not use subgroups. The working method is systematic, and for the commodity groups in the Leverage

category, we use RFI / RFQ procedures, find suitable offers and choose the most appropriate strategy depending on the negotiation result. In the Strategic Materials category, we work with suppliers in a partnership relationship. This product group is characterised by long-term projects, a precise schedule, a precise definition of needs and a lot of monitoring, reporting and collaboration with the supplier. We make strategic decisions at the highest level. The non-critical materials category in our organisation includes office supplies and maintenance supplies; in these areas we use reverse auction processes that we repeat every one to two years. The characteristics I would use to describe the materials in the bottleneck category are: small values, urgently need, and strong monitoring of supply.

The following is a summary of interviewee C:

I recognize the leverage category as materials with multiple supply options in the market, our partners are mostly supplier intermediaries. In parallel, we have multiple suppliers in this category. These product groups also excel at exploiting market demand and take up 80% of the work in our purchasing function. We know our suppliers well and constantly monitor their progress. The Strategic Materials category consists of product groups that are characterized by precise demand, i.e. a precise knowledge of the requirements and a comprehensive description of the technical specification. These are long-term projects with partners, and we make decisions at the organizational level. The characteristics of Non-Critical Materials are generally: free and extensive supply, local suppliers, minimal inventory, purchasing strategy decisions are made at a lower level. The bottleneck category contains materials with the characteristics of greater supplier power; usually they are rare and produced with new technologies, and buyers are willing to pay more because supply matters. Suppliers of these materials prefer their unique products and protect them with technologies, patents or similar techniques because they maintain the influence of power over buyers. The most appropriate strategies here are avoiding technical constraints and shifting the product group to Leverage Materials.

The third question gave us a practical experience of how each interviewee described the characteristics of each category. For interviewee A, we can see the exact categorization with subgroups in each category, interviewee B uses the classical matrix with the categorization of four basic groups as presented by Dr Kraljic. In the case of interviewee C, who represents a development organisation, we recognise the contradiction in the way of working and formulating strategies compared to interviewee B, who is solely focused on reselling. The interviewees do not use an objective procedure to segment suppliers or product groups in the Kraljic Matrix, so "there is no objective approach in practise", which confirms our thesis. We are satisfied with the results of the interviews, mainly because of the differences in the orientation of the organisation and the management of the Kraljic Matrix. The common denominator of all is the understanding of the matrix and management. There are obvious differences between industries, from which we can conclude that in the tree structure of product groups, all three organisations have different dispersion of product groups. We can see that Interviewee C (as it is a development oriented organisation) has product groups on the right hand side and shifts them to the left with levers to achieve strategies, while Interviewee B finds a greater dispersion of product groups on the left hand side (because the organisation is resale oriented) and therefore shifts product groups up or to the left into leverage materials. The latter finding is related to Interviewee A who states that product group characteristics change and

shifts product groups within the Kraljic Matrix in terms of implementing activities to change product group characteristics.

The next methodological step is to use a qualitative thematic network analysis tool. (Roblek, 2009, p. 56). Our aim is to explore and explain the understanding of the topic as well as the content of the reviewed literature and the semi-structured interviews. Following Stirling (2001, p. 390) and Roblek (2009, p. 58), the key coding process used to generalize qualitative data uncovers underlying meanings and patterns of contexts. This tool is a process that Stirling (2001, pp. 390-402) presents in the following six steps:

1. Step one is to process the *coded text* through a data reduction process by breaking the text into manageable chunks and assigning concepts to individual chunks of text. The researcher determines where and how patterns are identified.
2. Step two is *defining themes*, themes that have a substantive meaning for the whole set of codes are identified and defined by the identified themes. Summaries of the text from individual related codes are combined into a topic.
3. Step three is *creating a thematic network*, content-related themes are connected and summarised into a thematic network, so that several common topics can also be created.
4. In step four, the *description and definition of the thematic network*, we describe and research the network and present the data in the form of a report.
5. In step five, the *summary of the thematic network*, the main themes and patterns in the description of the networks are summarised and explained in terms of a concise presentation.
6. In step six, the *interpretation of the sample*, a complete summary of all networks is presented and compared in parallel with the findings from the literature reviewed.

In the coding process, labels were applied to all data from the relevant literature and all three semi-structured interviews that were subjectively significant in relation to our research. The essential feature of this type of study is the subjectivity of coding and criteria setting. In the next step, similar content sentences were formed in the text by selecting phenomena, assertions, statements, and ideas that appeared in our research. We proceeded to create thematic schemas requiring abstraction and synthesis. In the aggregation step, we identified the relationships between the themes we studied and interpreted them according to the research question. Through the research and data analysis process, in line with the research aim and coding process, we positively answered the following questions, summarized by Saldana (2015): What do people do? Why are we involving them? What are they trying to achieve? How exactly are they doing it? What specific tools or strategies do they use? How do people talk about and understand our topic? What assumptions do they make? How do we understand it? What have we learned (p.20-21)?

4 Results

The primary objective of our research is to explore and demonstrate an effective objective process of supplier or product group segmentation. Then, the results of the thematic network

process of the first set are presented. The results are followed by an analysis of the data obtained from the thematic network development and design process presented earlier. The results show the process of thematic network in the case of research on the objective process of segmentation of suppliers or product groups. In the research process, we conducted a process of thematic topics based on the material of the reviewed literature and semi-structured records of the interviewees in the research on objective procedures of segmentation of suppliers or product groups. As part of the research process, we defined meaningful codes (Step 1) and grouped them into groups that are related to each other in a certain subjective meaning. The formed groups, which are the subject of discussion, were grouped into newly identified themes (Step 2). In this step directions for the segmentation process of the supplier or a product group are identified. This is followed by a process of designing topics in the manner of combining "identified themes". In this way, we have created 4 themes identical to the groups in the Kraljic Matrix, all connected by a common theme, in step 3, segmentation of suppliers or product groups. The process of the thematic network continues in step 4, which shows the development of the schematic network (Figure 2). Step 2 and Step 3 are shown in Table 1. Common Theme Segmentation of suppliers or product groups includes 4 categories: Leverage Materials, Strategic Materials, Non-Critical Materials and Bottleneck Materials, as shown in Table 2. At the next level, the topics are linked in 11 identified topics, while 2 identified topics (Insurance of Supply and Long-Term Planning) are linked in two categories. Here we link to the findings of Lisan(2018, p. 2) who states that in some categories we have two suppliers to take advantage of price reductions and in another category we have two suppliers to assure supply.

Table 1. Identifying topics: the first and second step of the thematic network process

Codes (step 1)	Subject of discussion	Identified themes (step 2)
Offers	Intermediate suppliers	Exploiting purchasing power
Buyer power	Use of demands	Market research
Profit impact	Demand	
RFI/RFQ	Knowledge of suppliers	
Risk	Evaluation	
Alternatives	Strategic purchase	
Offer	Risk management	
Profit	Local or global suppliers	Long-term planning
Technical requirements	Precise demand	Strategic partnership
Innovation	Risk analysis	Moving to leverage materials
Technologies	Top management decisions	Expertise
Partners	Cooperation with the profession	
Top management	Strategic decisions	
	Demanding specifications	
Low risk	Non-demanding materials	Implementing efficiency
Low profit	Intermediate suppliers	Short win strategies
Plenty of offers	Standardized elements	
Simple technologies	Purchasing function decisions	
Office supplies	Efficiency: quantity versus price	
Lack of suppliers	Ownership of purchasing items	Controlling the supplier
Supplier's strength	Global suppliers	Supply insurance
Demanded specification	Unique products	Binding with contracts
Oligopol	Relatively low prices	
Low availability	Required knowledge	
Low profit	Level of innovation	

Table 2. Themes for the supplier or product group segmentation process

Identified themes (step 2)	Categories	Common themes (step 3)
Exploiting purchasing power	Leverage materials	Segmentation of suppliers or product groups
Market research	Strategic materials	
Long-term planning	Non-critical materials	
Strategic partnership	Bottleneck materials	
Moving to leverage materials		
Expertise		
Implementing efficiency		
Short win strategies		
Controlling the supplier		
Supply insurance		
Binding with contracts		

Figure 3 shows the eleven proposals for developing an objective procedure for segmenting suppliers or product groups into the Kraljic Matrix.



Figure 3. Thematic network (step 4): Segmentation of suppliers or product groups

5 Discussion

The central result of the research study is the design of eleven proposals (Figure 3) for the development of a categorization for the further strategic design of processes in the purchasing function, Step 6. The latter result is due to the careful selection of respondents and the relevant profession. The secondary result of the study is attributed to the transcript of the semi-structured interviews in which the reader of the research study can identify the methods, procedures, tools and ways of working of modern purchasing functions. The study shows the importance of knowing the purchasing market and how to deal with suppliers. We believe that earlier involvement of a supplier in a purchasing function is a key factor for further improvements in terms of development, cost and time at the organizational level. Similarly, Stoffers (2019, p. 63) states that strategic categories use the optimization of supplier relationships.

Furthermore, the study finds that suppliers or product groups change their position in the matrix depending on the behavior of the organization and the purchasing market. From this finding follows the recommendation to matrix managers to use a thematic scheme with objective criteria - themes in the presented scheme - when managing suppliers in the matrix. We also strongly recommend transferring product groups to other categories to avoid constraints, especially in the direction of strategic materials to leverage materials and bottleneck materials to non-critical materials. The recommended levers for changing categories are mainly recognized in the technical community, i.e., change of technical specifications, standardization or avoidance of certain technologies and patent ownership.

Comparing the sources of the data obtained, the literature review and the interviews, we can attribute a higher level of results to the interviews conducted. Finally, from the literature review and the interviews, we found that there is no objective procedure for segmenting suppliers or product groups into the Kraljic Matrix. From this finding, we derive our thesis T1: "There is no objective approach in practice". In reviewing the existing literature in the first part of the research paper, we identified a relatively large amount of literature on the topic of the Kraljic Matrix. The original article by Dr. Kraljic "Purchasing must become Supply management" was cited more than 3,300 times. In the second main part of the qualitative research, based on the results of semi-structured interviews, personal notes and observations of the network operation, we presented the research findings and interpretation of the obtained data using the analytical tool of the thematic network. By developing the principle of the thematic network (Step 5) for an efficient and objective process of supplier or product group segmentation, parallels were made with the topic of our research question, supplier or product group segmentation. The reader will see the parallels of the topics with the Kraljic Matrix categories (leverage materials, strategic materials, bottlenecks and non-critical materials).

6 Conclusion

As emphasized in the introduction, category management brings radical improvements to purchasing management, and the core of the research is the development of an efficient and objective process for segmenting suppliers or product groups. As mentioned earlier, Lisan

(2018, p. 2) says that in some categories we will have two suppliers to have leverage to reduce price and in another category we will have two suppliers to ensure supply. This study provides an additional contribution to the process of managing suppliers or product groups. We note that the management of product groups and the categorization process is the central area of the purchasing function, mainly because of the management of the costs of the organization. Bradač (2009, p. 12) writes that purchasing costs account for up to 80% of total organizational costs. By making the purchasing function work efficiently and finding opportunities for breakthroughs, the result of such studies creates added value for organizations in the form of lower purchase prices, lower overall costs, lower risk in the supply chain, or more innovation in the purchasing market. Understanding the matrix is critical for the manager of the categorization process. Understanding the matrix and categorizing suppliers or product groups into the matrix is a prerequisite for appropriate action and strategy formulation, and this part is attributed to the profession. And when we mention the contribution of the profession, we recognize the addition of the relationship with suppliers who gain additional understanding through the study to continuously improve the level of relationship management with suppliers.

This research study has limitations. The research was done at the time of COVID-19, we leave the possibility of other results in the F2F interview. However, the scope and usefulness of the study is relatively limited to a specific audience, especially those who work in the purchasing function. All interview participants are from Slovenia. We emphasize that the subjectivity of the chosen methodology (coding, developing themes into topics and creating common themes) is a feature of this type of study that has no bearing on the views that an individual develops in the study and therefore has no impact on the findings. This study is limited to the cited sources in the literature and interviews with knowledgeable experts.

We recommend that the research study be extended in the direction of exploring a range of tools and analysis, communication planning, and analysis of the power relationship between the buyer and the supplier. We also recommend another scientific study in the direction of proposing appropriate strategies and moving to the next step, the selection of appropriate communication to obtain the approval of internal customers in the implementation of the strategies. Another positive factor of the study is the identification of tools and detailed recommendations for the management of a contemporary purchasing function, mainly identified from semi-structured interviews.

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Povzetek:

Objektivni postopek segmentacije dobaviteljev ali blagovnih skupin v Kraljičevo matriko

Ozadje in izvirnost: Dandanes nabavna funkcija uporablja metode in postopke, ki organizacijam celovito dviga konkurenčno prednost s strateško usmerjenim delovanjem. Prvi korak v procesu oblikovanja nabavne strategije je segmentacija dobaviteljev ali blagovnih skupin s pomočjo orodja Kraljičeve matrike. Ob predpostavki, da različne situacije zahtevajo različne aktivnosti ter da je postopek segmentacije dobaviteljev ali blagovne skupine subjektivno naravnano sklepamo, da rezultat posplošene segmentacije vodi k pasivnem vedenju nabavne funkcije. Iz te percepcije razvijamo znanstveno raziskovalno vprašanje: »Kakšen pa je učinkovit objektivni postopek segmentacije dobaviteljev ali blagovnih skupin?« Osnovni namen je usvojiti razumevanje Kraljičeve matrike in postopek segmentacije in pridobiti ključne usmeritve za objektivni postopek segmentacije.

Metoda: V prvem delu znanstvene raziskave bomo pregledali obstoječo literaturo na temo Kraljičeve matrike in s tem usvojili razumevanje segmentacije dobaviteljev ali nabavnih skupin. V nadaljevanju znanstvene študije bomo z intervjuvanjem izbrane stroke pridobili mnenje stroke in izvajanje Kraljičeve matrike v praksi. Sledi sklop metodologije, z uporabo kvalitativno analitičnega orodja tematskih mrež na obsegu sklopov pregledane literature in pol strukturiranega intervjuja fokusne skupine treh specialistov.

Rezultati: Rezultati prikazujejo proces razvoja tematske mreže na obsegu sklopov pregledane literature in pol strukturiranega intervjuja študije objektivnega postopka segmentacije dobaviteljev ali blagovnih skupin.

Družba: Celotna družba lahko pridobi na medsebojnem organizacijskem razumevanju, ki vključuje pojme kot so trajnost, okolje, družba, kultura in napredek. Posredni vpliv na družbo se izrazi v obliki znižanja nabavnih cen, zmanjšanja skupnih stroškov, zmanjšanja tveganja dobavne verige ali zagotavljanja povečanih inovacij iz nabavnega trga.

Omejitve/nadaljnje raziskovanje: Znanstvena raziskava je omejena na navedene vire v literaturi in intervjuancev. Nadaljevanje raziskave priporočamo v širšem zajemu obsega literature, zajemu večje in/ali homogene skupine intervjuvancu za namen strukturiranega intervjuja.

Ključne besede: strategija, nabavna funkcija, Kraljičeva matrika, segmentacija, dobavitelji, blagovna skupina.

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