



# **EVALUATING THE SUPPLIER SELECTION PROCESS TO IMPROVE SUSTAINABLE PRACTICES.**

A case study of Raute Corporation

Lappeenranta–Lahti University of Technology LUT

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## ABSTRACT

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Evaluating the supplier selection process to improve sustainable practices.

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**Keywords:** Supplier selection, selection criteria, procurement, sustainability, corporate social responsibility (CSR), environmental, Environmental Social and Governance (ESG).

Supplier selection is highlighted as one of the key factors in attaining the organizational sustainability goals and developing sustainable supply chain networks. Due to its significance, more evidence is needed to advance the knowledge and provide practical insights. Thus, this thesis research aims to evaluate the supplier selection process and its influence on the improving sustainability practices of a famous Finnish company Raute corporation. For the purpose of this research, a case study method is selected, and data is collected from the different sources such as interviews, archival data, and other sources. As

the case company has many suppliers both domestically and internationally, in this thesis we focus on the supplier selection process in the (LVL) laminated veneer lumber and cutting-edge industries that make wood-based plates and bars for the building sector.

The research findings highlight the diverse selection criteria used and influenced by various factors including product nature, business area, company values, objectives, and supplier importance. Defining supplier selection criteria precisely can enhance business operations and competitiveness. Raute prioritizes a demanding and comprehensive supplier selection process to guarantee that its operations are aligned with its core principles and strategic goals. This includes a thorough evaluation of potential suppliers, considering sustainability and responsible business practices beyond typical metrics. Supplier selection significantly influences environmental, social, and governance (ESG) practices, impacting Raute's overall sustainability and ethical position. Moreover, selecting suppliers committed to sustainability can reduce the environmental impact of the manufacturing process. Selecting environmentally responsible suppliers corresponding with sustainable production approaches, which prioritize reducing consumption of energy and applying waste management measures across the supply chain. This research reinforces the significance of supplier selection for enhancing the company's environmental, social, and governance practices and provides valuable insights for policy and practice.

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Although many people think of an M. Sc. thesis project as a challenging task, my experience has been quite the opposite. I am grateful to many people who have helped me through every phase of this research. The relentless support of Raute Corporation and its members set the foundation for this project. A substantial number of colleagues have played a critical role in determining the research's direction at different phases. Despite the obstacles, I, and the research itself were constantly given sufficient time and support.

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Finally, I'd like to dedicate this achievement to my mother for encouraging me throughout my whole life and providing me with love and opportunities. I will always remember her words of wisdom, such as "Dariskaaga wanaaji, ayagana wey ku wanaajinayaan," meaning be kind to your neighbours and they will be kind to you. This piece of advice has the potential to change the world for the better.

## SYMBOLS AND ABBREVIATIONS

### Abbreviations

AHP	Analytic Hierarchy Process
CSR	Corporate Social Responsibility
ESG	Environmental, Social and Governance
ISO	International Company for Standardization
KPI	Key Performance Indicator
LVL	Laminated Veneer Lumber
MCDM	Multiple Criteria Decision-Making
OTD	On-Time Delivery
R&D	Research and Development
SCM	Supply Chain Management
TCO	Total Cost of Ownership

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# 1 Introduction

One of the most important tasks of the procurement manager is the evaluation and selection of suppliers to attain various environmental and financial benefits. This applies to all areas of business and applies to all components purchased. The importance of supplier selection is recognised already in the beginning of establishing Raute in 1908 when it was operating under the name of Lahden Rauta- ja Metalliteollisuustehdas Oy (Raute Governance, 2023). The supplier market has become more international as the market has expanded. Even an outstanding supplier may no longer be enough, but companies are increasingly looking for world-class suppliers in their field as partners. Today, it is impossible to achieve cost-effective end products with the desired quality without having an effective supplier selection process (Langedal 2023).

The selection of suppliers for strategic components is important for a big company like Raute that strives to stand out among the major players in the global market. Differentiation is achieved by manufacturing low-volume products tailored to the customer's needs, by serving customers with short delivery times and according to their own starting points. Continuous product development is essential to increase market share (Tariq, Badir, and Chonglertham 2019; Wichmann et al. 2022). Moreover, it can also give advantage to organization in selecting process which are favourable to gain various benefits (Dost et al. 2016; Tariq et al. 2022). Product development projects pose new challenges to suppliers' ability to adapt to new challenges such as adopting a sustainable development approach (Javadi et al., 2016). These starting points gave rise to the need at Raute to study more closely from the perspective of strategic sustainability in supplier selection and to look at alternative supplier selection criteria. Commissioning this master's thesis was considered a suitable opportunity to study the topic in more detail specially in terms of sustainability, the influence of the new ESG directive and socially responsible. Also, to identify the existing innovative practices that promote social responsibility evaluate the adoption and implementation of socially responsible practices by suppliers, as well as their subsequent influence on Raute's overall sustainability performance.

Schramm et al. (2020) article on sustainable supplier selection strategies emphasizes the importance of the use of a structured framework for supplier selection to incorporate multiple

criteria and manage the complexities of supplier selection process. Multiple Criteria Decision-Making (MCDM) approach to deal with the difficulties of decision-making in supplier selection. Although the approach they use is not identical to this thesis. Instead of summarizing existing literature, this thesis research uses a qualitative method, examining Raute's supplier selection process and its influence on the company's sustainability practices. The thesis focuses on the interaction of supplier selection processes and sustainability outcomes in a real-world organizational context. The research questions are targeted to Raute's context, looking at how it aligns with strategic goals and corporate principles, as well as how it affects sustainability practices. This method allows for a better knowledge of Raute's specific challenges and potential in establishing resilience and sustainable supply chain processes.

The thesis research focuses on Raute corporation, which is an international player in the wood products industry, and how it selects suppliers to improve sustainability practices. Compared to Govindan et al.'s (2018) research, which looks at corporate social responsibility (CSR) in supplier selection in general, the thesis focuses on Raute's specific setting within the wood products business. The research questions are designed to better understand Raute's supplier selection process and its effects on sustainability practices. It uses a hybrid multi-criteria decision-making framework, whereas Govindan et al. (2018) adopt a broader approach. The thesis research is geographically focused, requiring an additional approach to evaluating and improving sustainability practices on a global scale.

Wu et al.'s (2021) research focuses on sustainable supplier selection approaches in the chemical industry, whereas the thesis focuses on a specific company in the wood industry. Both researches aim to evaluate supplier selection processes in order to improve sustainability, but they focus on different aspects of the problem. Wu et al. suggest a multi-method approach for evaluating the economic, social, and environmental aspects of sustainable supplier selection, whereas the thesis research uses a qualitative case study approach. Both studies aim for broad implementation across their industry. Despite similarities, aims, approaches, and objectives are substantially different.

This case study research provides new perspectives into Raute's supplier selection process, with a particular focus on its impact on sustainable practices. By addressing key research questions such as how Raute corporation aligns its supplier selection with strategic objectives and corporate values, how selection criteria are used for optimal results, and how

the selection process influences sustainability practices, the study looks into previously unexplored aspects of handling suppliers. Furthermore, the study extends beyond common supplier selection criteria to analyse the integration of important sustainability issues and the use of alternative factors in supplier selection. The research also addresses emerging developments, such as the influence of the new ESG directive and its focus on social responsibility, demonstrating Raute's commitment to sustainable business practices. In addition, the research evaluates suppliers' adoption and implementation of socially responsible practices, as well as their influence on Raute's overall sustainability performance.

### 1.1 Objectives of the research

The aim of the thesis is to evaluate the current supplier selection process used by the case company and its influence on sustainability practices. The study aims to understand how the company develops its supplier selection criteria by answering research questions.

- How does Raute corporation select its suppliers to ensure alignment with strategic objectives and corporate values?
- How does the selection process influence the sustainability practices of the company?

### 1.2 Research significance

The evaluation of supplier selection processes is an important topic in business and supply chain management research. This area of study is critical since it has a direct influence on the efficiency, reliability, and overall performance of the company's supply chain (Lasch and Janker 2005). Organizations can improve their procurement processes, reduce risks, and obtain a competitive advantage in the market by carefully exploring and analysing supplier selection processes. Understanding the importance of supplier selection studies requires acknowledging its complicated contribution. First, an effective supplier selection process reduces expenses and improves profitability by selecting suppliers who provide the best value for assets while keeping quality standards. Second, it helps reduce supply chain risks by selecting and collaborating with reliable suppliers who can provide products and

services consistently and on time. Third, an efficient supplier selection process may improve collaboration and innovation throughout the supply chain, promoting long-term partnerships and strategic alliances with key suppliers (Lasch and Janker 2005).

Furthermore, in today's business environment, there is an increasing focus on sustainability and corporate social responsibility. The supplier selection process is critical for ensuring that companies meet environmental, social, and governance (ESG) standards. Companies that integrate sustainability factors into their supplier selection processes can promote ethical conduct, reduce their environmental footprint, and improve their reputation as responsible corporations.

The thesis analyses the selection criteria through familiarization with the case company's supplier selection process and supplier classification. The goal is to understand the background of supplier selection criteria. The core areas of research are the phases of the strategic supplier selection process identification, assessment of the sustainability, ESG, innovative and evaluation the process of supplier selection. An essential part of the evaluation process is the pooling of views within the company. During the research, manufacturing methods and the geographical location of supplier markets are also to be examined to get a prouder picture of the influence on the company.

A closer examination of the negotiation process with suppliers and the structure of the agreement is excluded from the research as it is considered sensitive information. Also, sufficient research of it would require a wider angle of approach. However, it is included in the research when assessing the supplier selection criteria.

### 1.2.1 Research problem statement

The incorporation of sustainability practices into supply chain operations is critical for companies seeking long-term success and social responsibility. However, there is still a lack of understanding on how to optimize supplier selection processes in order to effectively improve sustainability practices. Raute corporation, a global producer of technologies and services to the wood products industry, confronts this obstacle. The need to evaluate and enhance Raute's supplier selection process is critical to ensuring alignment with strategic objectives and corporate values, particularly in terms of sustainability.

Despite Raute's dedication to sustainable development, there is a lack of full understanding of how the company selects suppliers and how this process affects its sustainability practices. This knowledge gap restricts Raute's ability to optimize supplier relationships and poses larger challenges for seeking to effectively integrate sustainability into their corporate strategies.

This research aims to address the gap by carrying out a thorough evaluation of Raute's supplier selection process, focusing on its alignment with strategic objectives and corporate principles, as well as its effect on the company's sustainability practices. The research largely focuses on Raute's supplier selection process and its implications for sustainability practices, utilizing a qualitative case study technique. The research acknowledges the possible restrictions of access to confidential information and the subjective character of qualitative research approaches.

### 1.3 Structure of the master's thesis

The research is clearly divided into two parts. The first part is the theoretical part which primarily seeks to use sources other than the case study itself to give depth to the research. The aim is to use both widely known textbook material, observations, and publications such as articles as sources. The applied part in the second half of the work broadly follows the evaluation of supplier selection process.

After the company presentation, the research report discusses the environment in which the buyer and supplier company are operating. The situation is examined from the buyer's and supplier's perspectives and considers what the product being sold means to both. After that, the thesis research focuses on the selection of supplier relationship process and its influence on the environment. However, the focus of the chapter is on examining the supplier selection process.

The third actual theoretical chapter deals with the stages of the selection process. The focus of the chapter is on supplier selection process evaluation and its influence in terms of social responsibility. In addition, the chapter discusses supplier selection tools and risk management.

The chapter between the theory part and the applied part discusses the selection process which is then used as a framework when using the conclusions of the theory section in the applied chapters. Figure 1. shows the progress of the research process.

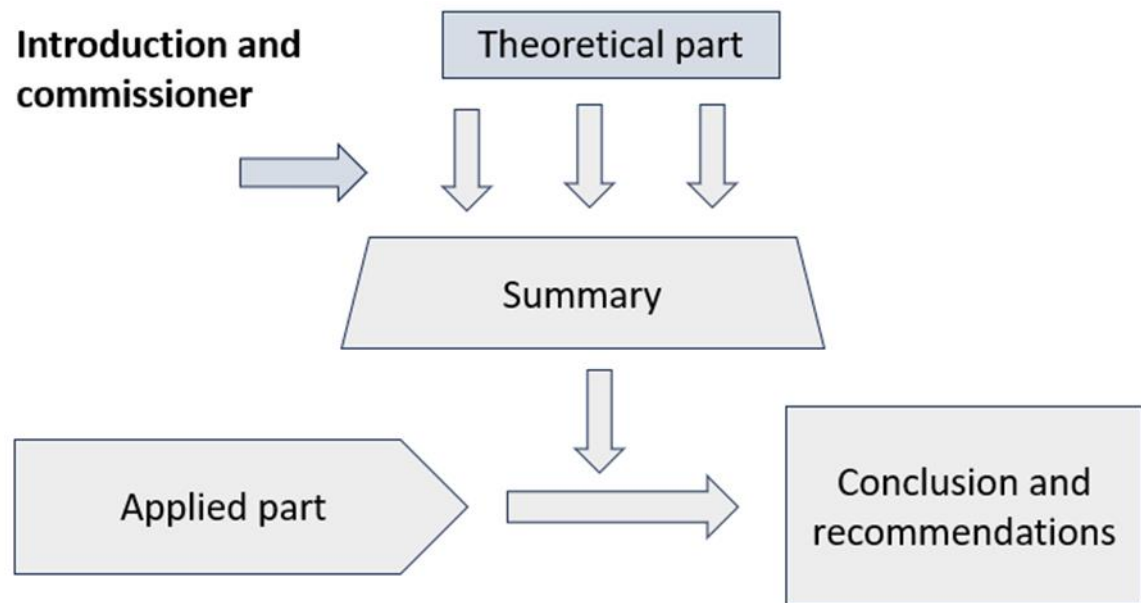


Figure 1: Structure of the M. Sc. Thesis (Adopted and modified from Juergens, 2015).

At the end of each theory part, there is a summary summarizing the issues discussed in the chapter. The final part of the thesis work is a summary in which the results obtained in the applied part are evaluated. Their relationship to the theoretical analysis is considered and it will be examined how the results obtained correspond to the set goals and what benefits the results bring to the company.

#### 1.4 Implementation of the research

The theoretical examination first aims to provide the deepest possible overview of the prevailing practices and new trends in the field. The aim is to complete the theoretical part before the research of the applied part is fully started. An important part of the applied part of the research is Raute's own procurement manager and ESG manager, whose knowledge can be used to determine real needs and carry out the final assessment.

Research includes suppliers' evaluation, which provide market information and information for supplier selection evaluation. Supplier evaluations are also important in assessing opportunities to develop the supplier relationship. The third element for the success of research is finding ways to process the collected data into an applicable form. The use of decision support systems is considered for this.

In the beginning, a tight schedule was set for the research, considering the scope of the topic. The research started back in September 2023. It must be completed within a little over six months of starting the research.

The emphasis on theory alone in the initial part of the research is also partly due to the time at which the research is conducted. Raute has had a big change in its ERP system and hired an ESG manager. Due to these changes specially the new ERP system obtaining full data information about the company is difficult. On the other hand, theoretical part is available to use.

## 2 Literature review

In this section, we look at the theoretical basis of supplier selection. The research begins with a brief overview of supplier selection, emphasizing its importance in supply chain management. Following that, we explore the various selection processes used by companies to find and integrate suppliers efficiently. Within this theoretical framework, we analyse Kraljic's matrix, a fundamental approach to classifying suppliers based on strategic importance and supply risk. Finally, we look at the wide range of supplier selection criteria, which includes elements like reliability, delivery, and responsiveness. Through this comprehensive analysis, the aim is to provide a detailed knowledge of the theoretical foundations that drive supplier selection processes, opening opportunities for detailed decision-making and effective sourcing initiatives.

### 2.1 Sustainable supplier selection

Supplier selection is an important part of successful supply chain management as it influences the company's overall efficiency, dependability, and sustainability. This process includes carefully reviewing and selecting suppliers based on several criteria, including quality, pricing, dependability, and most importantly alignment with the sustainability and company's values (Roehrich, J. K. et al. 2017). Typically, supplier selection begins with a review of needs, which defines criteria and expectations. Potential suppliers are then carefully analysed using a standardized evaluation process. Financial reliability, production capability, and compliance with applicable regulations can all play a role during this evaluation. The selection of sustainable suppliers is a crucial aspect of ethical business practices since it demonstrates a company's commitment to environmental, social, and ethical factors. Companies use this method to carefully examine and select suppliers based not only on traditional performance measures, but also on their commitment to sustainability values (Liu & You, 2021).

Sustainable supplier selection takes an overall strategy that prioritizes long-term relationships over short-term advantages. It goes beyond transactional interactions,

intending to create a network of suppliers who share a commitment to sustainability. This cooperative effort results in a supply chain environment in which each participant actively contributes to the overall objective of promoting a more environmentally friendly and responsible business environment (Liu & You, 202).

Companies can play an important role in spreading sustainable practices across industries by selecting suppliers deliberately and thoughtfully. Sustainability is one of the most important criteria identified in the modern business world. Companies are increasingly prioritizing suppliers with strong sustainability practices to reduce environmental impact and correspond to corporate social responsibility objectives (Pagell and Shevchenko 2014). Sustainability criteria cover a wide range of aspects, such as suppliers' environmental management systems, reducing carbon footprint measures, the use of renewable energy sources, and compliance with ethical labour standards.

Another significant criterion highlighted is innovation potential. Companies prefer suppliers who take a proactive attitude to innovation, allowing them to respond to changing market demands and gain an edge over their competitors (Queiroz, Filho and Costa Melo 2023). Innovation criteria include a supplier's research and development capability, track record of launching new products or technologies, and willingness to engage in collaborative innovation projects.

## 2.2 Supplier classification

One of the most important elements of the supplier selection process is defining the relationship between the buyer and the supplier. The primary criteria for the supplier selection process can be developed based on the company's competitive position and strategy (Contador et al., 2022). Companies can use a variety of portfolio models to help classify suppliers. Portfolios are used to categorize suppliers and identify the most strategically important ones. Companies can utilize classification to better manage and lead suppliers, as well as establish different selection criteria and methods to apply to different categories of suppliers (Garzon, F. S. et al. 2019).

Kraljic was the first to introduce a full portfolio model for procurement management. The model strategy is focused on classifying suppliers, products, and services according to their

strategic value. The Kraljic portfolio strategy is based on the idea that different suppliers represent different interests in the company, and therefore different procurement strategies should be created for different suppliers. The Kraljic portfolio is intended to assist companies in identifying business weaknesses and developing approaches to protect themselves from potential supplier influence. The company needs to protect itself against supply disruptions, plan for technological and economic developments, and ensure the long-term stability of collaborations with suppliers (Kraljic, P. 1983).

Kraljic Peter (1983) defines the requirement for a company's procurement strategy as two main factors: the strategic importance of the acquisition and the complexity of the supplier market. The strategic relevance of procurement is determined by how much the purchase adds value to the different product lines, the share of raw materials in the total cost, and the influence on the profitability of the company. Supplier market complexity, on the other hand, relates to the lack of suppliers in the market, the rate of advancement in technology, the speed of replacement materials, the cost of logistics, the obstacles to market access, and the degree of dominance in the supplier market.

According to Kraljic Peter, by analysing these two aspects, procurement strategies and selection criteria can be developed to maximize purchasing power with key suppliers while minimizing risks. Kraljic proposed a four-part approach for developing a procurement strategy: procurement classification, market analysis, strategic positioning, and action plan and strategy development. Based on this, a matrix is generated that can be utilized to categorize and examine procurement and suppliers.

Kraljic's (1983) portfolio model categorizes purchases based on two key characteristics into four categories: strategic products, bottlenecked products, leverage products, and routine products. The most important factors in the matrix are performance outcome and delivery risk. Delivery risk is determined by the product's availability, the number of suppliers, market demand, production alternatives, storage issues, and replacement procurement strategies. The four groups that result from the classification of each demand offer a distinctive strategy to suppliers.

Various methods of classifying components are presented in the literature to determine the procurement strategies that are suitable for them. Procurement products can be divided into two (Weele, A. J. van. 1997).

- Products that are influenced on financial performance. This refers to the company's importance of strategic components and efficient procurement.
- Delivery uncertainty related to the strategic components. This means uncertainty in the availability of strategic components, such as finding a new supplier, the possibility of manufacturing the component itself and the degree of competition in the supplier market.

Kraljic's Portfolio Matrix is a well-known procurement model that classifies a company's supply of products into four categories based on two primary measurements: supply risk and strategic influence. Evaluating this matrix through the perspective of sustainability reveals how companies may include environmental, social, and governance (ESG) factors in their supply chain strategies.

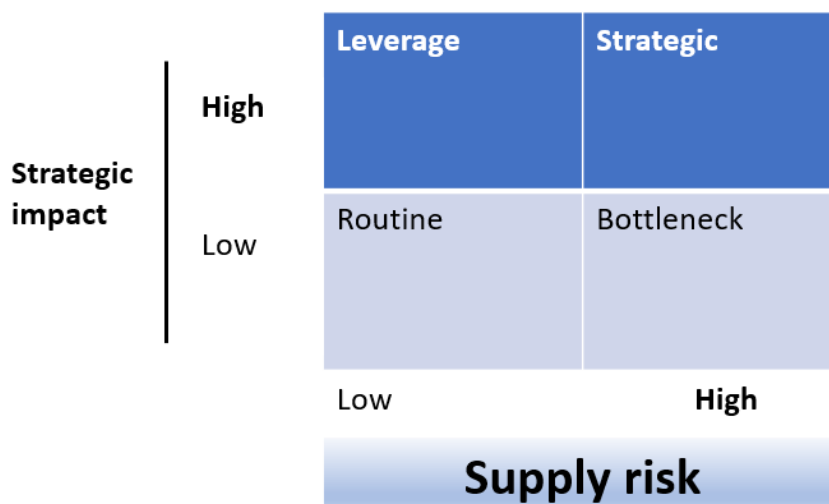


Figure 2: Kraljic portfolio model. (Adopted and modified from Calisir, F. & Durucu, M. 2023).

- Strategic products offer an important proportion of the final product's value, and their supply is limited. Procurement prioritizes strategic products. Strategic products have a high-profit influence and high supply risk and demand a careful combination of sustainability and risk reduction. Companies can investigate sustainable alternatives for strategic components while also diversifying their supply base to increase resilience. This strategy reduces environmental effects while maintaining supply chain consistency.

- Leverage products are quite important for generating profits, but they can be easily obtained from many suppliers or can also be manufactured in-house. Strategic products and leverage products make up about 80% of the procurement. Leverage products have a high-profit influence and low supply risk. It is critical for improving both financial and environmental influences. Companies can negotiate for sustainable sourcing policies, which encourage suppliers to use environmentally friendly manufacturing processes and ethical labour standards. This assures that profits do not come at the expense of environmental or social responsibilities.
- Bottleneck products do not make up a large part of a company's revenue, but they are difficult to obtain and can be procured, therefore, bottleneck products may become critical in some situations. Bottleneck products have a significant supply risk but a low-profit impact, therefore, the focus on sustainability tends to focus on minimizing risks. Developing alternating suppliers, prioritizing resilience in dealing with disruptions, and ensuring environmental standards can contribute to a more sustainable strategy.
- Routine products include the majority of purchased products. Their acquisition is easy, but the return they generate is from the margin. The aim of procurement is to routinise their procurement as far as possible so that there are enough resources for the more important procurement. Although routine products typically have a low impact on profits and supply risk, combining sustainability measures is important. Implementing sustainable approaches, especially in routine purchases improves a company's overall commitment to ESG principles. This could include sourcing from local suppliers to reduce carbon footprints or selecting products with fewer environmental influences.

Implementing sustainability into Kraljic's Portfolio Matrix includes a good understanding of each category's characteristics. Combining procurement strategies with sustainability objectives, companies can encourage sustainable supply chain practices across all product categories, resulting in a more resilient and ethical business environment.

### 2.2.1 Make-or-buy

The decision can take place at many different levels in the company. When it is made at the level where the purchase takes place, the decision is can be operational in nature. The operational decision is based on a ready-made policy, according to which one of the two options must be chosen. At the tactical level, the "buy or do it yourself" decision is made by the middle management, and then it may concern, for example, temporarily needed capacity to transfer. When a decision is made all the way to the company's top management, it is strategic in nature and the effects are long-lasting and wide-ranging for the entire company's operations. Companies' buy-or-make decisions are becoming increasingly tough and complicated, as they must assess several possibilities and make difficult compromises that balance both of the company's short-term goals and long-term goals (Probert, D. R. 1996).

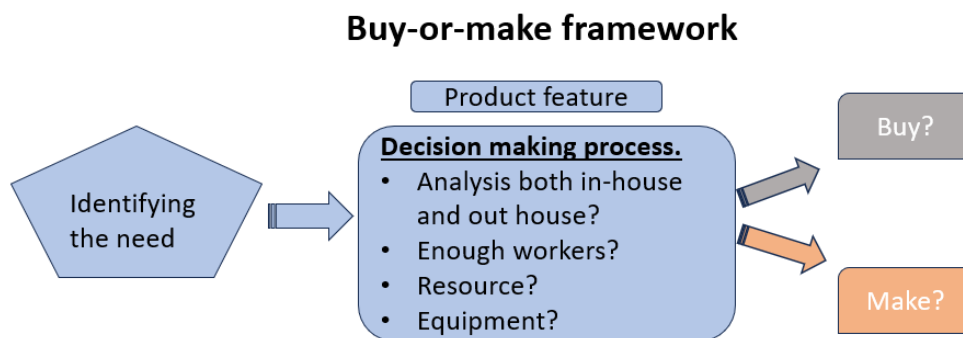


Figure 3: Buy-or-make framework (Adopted and modified from Zhang et al., 2019).

The decision-making model frame of buy-or-make emphasizes the decision-making process of the decision steps as well as how the industry determines the corporate decision-making process. Companies can either manufacture their very own products or purchase them from others. The make-or-buy decision is between buying from others and manufacturing in-house with the resources of the company (Probert, D. R. 1996).

Companies are increasingly realizing the importance of make-or-buy decisions in their procurement strategy. Companies have been able to drift into a scenario where their position in the vertical and horizontal procurement chains has already been set all throughout the duration of their existence. This is most likely the outcome of companies focusing on the short term rather than the long term (Schniederjans et al., 2015). Long-term outsourcing to countries with low wages simply for cost reasons can be exceedingly problematic in terms of the company's outcome, due to poor quality and unreliable delivery (Wolszczak-Derlacz

& Parteka, 2016). There might be several reasons for a company to consider manufacturing itself instead of buying from others. The most essential reasons for companies to outsource are to reduce operational expenses, focus on fundamental skills and flexibility, and increase efficiency. The most essential motive for outsourcing is frequently to reduce operational expenses (Huth et al., 2015).

Many companies make outsourcing selections solely for the purpose of achieving short-term cost reductions. Companies fail to consider critical manufacturing and purchasing issues, such as whether the company should build and maintain technical skills, or if the company should buy it from the supplier with the highest quality in the industry. Is the company's capability sufficient to manufacture itself? Are the company's production and planning following behind potential suppliers? Is it possible to coordinate manufacturing with internal processes successfully if a component of the product requires numerous different stages of production with subcontractors? (Goehlich, 2009).

The strategic evaluation of whether a company should manufacture a product or service internally or purchase it from third parties is relevant to sustainability. Companies evaluate the environmental influence of both internal manufacturing and external sourcing. This involves evaluating the carbon footprint, resource usage, and waste output for each alternative. Choosing more sustainable sources, whether internal or external promotes environmentally friendly processes and contributes to overall business sustainability.

Social factors in make-or-buy decisions include labour practices and larger social implications (Zhang et al., 2019). Companies may select suppliers who comply with ethical labour standards, pay fair salaries, and promote community development. This social responsibility aspect is critical in establishing the long-term sustainability of the chosen strategy whether make-or-buy. A sustainable make-or-buy decision requires evaluating long-term expenses, including potential cost savings from outsourcing. Sustainability issues could impact financial decisions as companies increasingly acknowledge the importance of social and environmental responsibility practices in brand reputation and customer loyalty.

In a supplier selection situation, the buy-or-make decision can be tactical if it is used, for example, as a tool for balancing utilization. In general, however, it is probably a strategic decision. The importance of strategically is emphasized when the component in question

belongs to the group of strategic components presented in the previous paragraph (Moschuris, 2015).

The reasons for buy-decision can be related to manufacturing cost, delivery time, quality, capacity shortage, inventory level, flexibility, the product itself to create value and legal aspect such as patent issues (Friedrich, A. et al. 2022). It is always necessary to remember the time of the decision, as well as the capacity that already exists. If the company has the machinery and personnel to make components, it can be a relatively expensive solution not to use them. On the other hand, if the decision is made to manufacture in-house, the acquisition of new machinery and personnel binds the company to the decision for a long time, while the purchasing solution does not exclude later switching to in-house manufacturing.

Including sustainability in the make-or-buy decision process indicates a commitment to ethical corporate behaviour. Companies may align their strategic decisions with sustainability goals by carefully considering environmental, social, and financial factors resulting in an increasingly sustainable and ethical supply chain.

## 2.3 Product specification

The product specification given to the supplier is one of the essential decisions when determining supplier policy. There are four scope groups of specification for outsourcing policy. Firstly, design and manufacturing to order approach; the selected supplier conducts the product development itself so that the customer company purchases the services from the supplier. In this case, the supplier has extensive ability in their field. The risk for the customer is that the competitor may receive help with the development work conducted by the supplier (Johnsen 2009). Secondly, manufacturing to order; the main design responsibility is maintained, and the supplier makes components according to the customer's drawings. In this case, the focus is the service on the production quality (Yarbrough 2021). Thirdly, the supplier's own products; in this case the supplier is responsible for the design, but also makes the same components for other companies. There is less interaction between buyer and supplier. The focus is on practical transaction arrangements (Wu, Choi and Rungtusanatham 2009). Lastly, established products; Established products refer to components that are widely available in the market. They are easy to acquire, and the

supplier relationship is typically loose. A loose specification scope may enable the supplier to use its own expertise more efficiently and to increase the responsibility for the performance of the component (Bhattacharjee 2022). On the other hand, it is difficult to evaluate different suppliers due to different solutions.

Ensuring the final product's sustainability requires a comprehensive assessment of its functionality that goes beyond the basic needs (Preeya, 2022). The problem develops when considering supplier dependencies, especially in terms of specification solutions. Dependency on certain supplier specifications could block the development of alternative, more sustainable materials, or processes. Although detailed specifications help the company understand the product, they can also create obstacles to switching suppliers and limit the flexibility required for sustainable operations (Schiele, H. & Vos, F. G. S. 2015).

Appropriate specifications provide companies with a complete understanding of their product's environmental influence. This understanding enables a more detailed evaluation of the product's sustainability including factors such as utilization of resources, energy consumption, and waste output. However, a delicate balance is required as overly strict standards may unintentionally prevent suppliers from providing environmentally friendly alternatives, even if they can deliver reliable and sustainable products (Chu, D. X. 2013).

## 2.4 Market evaluation on the supplier's perspective

A fascinating feature of the supplier's market is that it is hard to predict the market situation in the counterparty's perspective. In this section, we try to put ourselves in the shoes of the supplier for a moment and understand how the supplier sees its market potential.

### 2.4.1 General market evaluation

In the supplier market, the competitive situation according to the players on both sides can be illustrated using figure 4.

Suppliers \ Buyers	Buyers		
	One	Few	Many
One	Bilateral monopoly	Limited supply-side	Supply-side monopoly
Few	Limited demand-side monopoly	Bilateral oligopoly	Supply-side oligopoly
Many	Demand-side monopoly	Demand-side oligopoly suppliers	Polypolistic competition

	= Demand-side much higher than supply-side
	= Demand and supply are balanced (market equilibrium)
	= Supply-side much higher than demand-side

Figure 4: Supplier market structure (Adopted and modified from Van Weele 1997).

In the presented supplier market structure, the relative influence of the buyer increases when moving towards the lower left corner. In this case, the supplier is poorly able to influence the situation in the market through its own actions. The supplier is relatively stronger when moving towards the top right corner. In this case, the buyer has little influence through their own actions to the state of the market (Van, 2014).

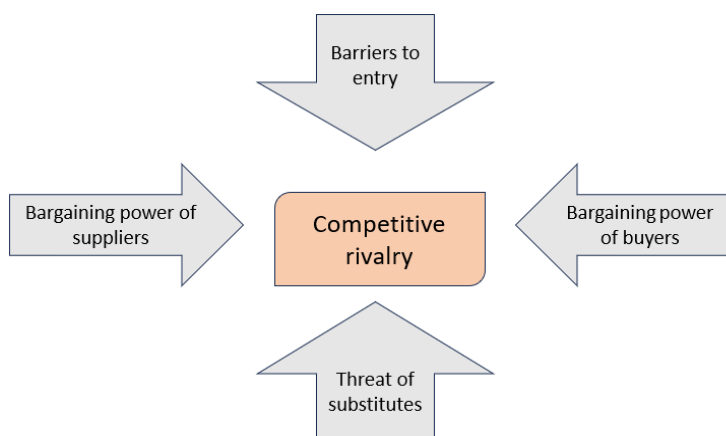


Figure 5: Illustration of intensity of competition in the industry; Adopted by Porter's five forces used to determine the intensity of competition in the industry (Modified from Morrison, 2021).

The core element of the supplier's market environment is competitive rivalry, the intensity of which may vary. The emergence of new players on the market breaks the prevailing market situation and drives those operating in the market to seek new solutions. The entry of new players is made possible by finding gaps in the market and filling them and thus gaining market share. On the other hand, new product and manufacturing method innovations are developed and substitute products are created, and consequently the market changes. This causes fluctuations in the market, to which the company operating there must be able to react (Porter, M. E.1998).

The horizontal axis is the pressure placed on the company by its own suppliers and buyers. Both groups have their own advantages that the company should do its best to consider. Sometimes the bargaining power can be quite superior to your own supplier, but insignificant compared to the customer. Sometimes the balance of power is reversed. The situation will change as the market develops (Porter, M. E.1998).

#### 2.4.2 Status of buying company

The supplier differently sees different customers. Perhaps it separates clients systematically into market categories with different levels of interest and levels of service in business strategy. It is also possible that the divide is less systematic. The supplier seeks a better-structured approach to its market and existing customers through segmentation. It tries to better understand its customers' demands and to meet them as effectively as possible.

Supplier market segmentation can be divided into two parts, macro- and micro segmentation (Hutt, M. D. & Speh, T. W. 2010).

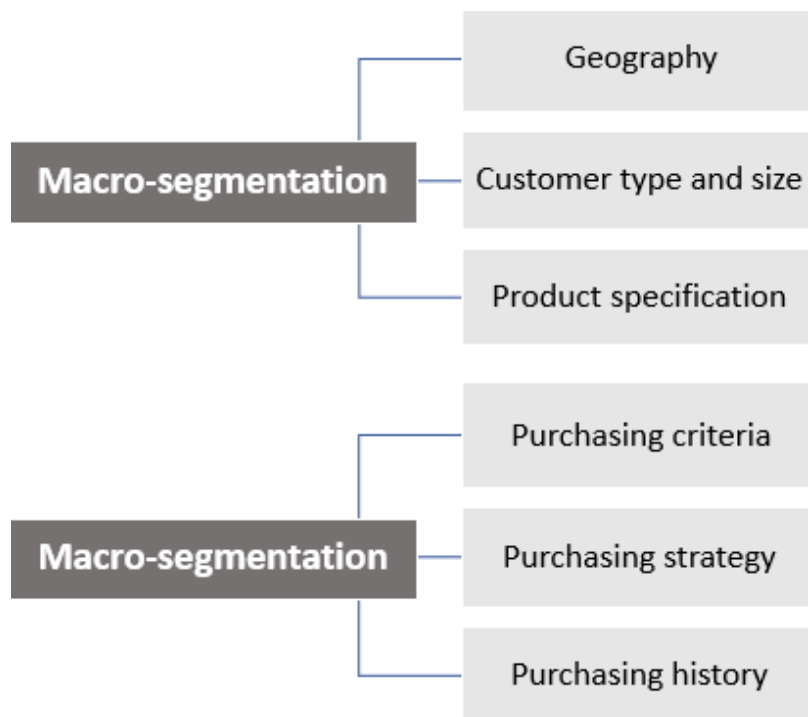


Figure 6: Supplier market segmentation (Adopted and modified from Hutt, M. D. & Speh, T. W. 2010).

Macro segmentation is done based on the novelty of the purchase transaction. The three parts of the division include first-time buyers, repeat buyers and experienced buyers. After macro segmentation, the division is continued into microsegments and is conducted into as many parts as is necessary for effective market management. Possible criteria for micro segmentation may include:

- A key criterion set by the customer when making purchasing decisions.
- customer's product-service prioritization: other suppliers value the customer and the agreement proven throughout the negotiating process, and they look forward to future cooperation. Making a purchasing decision quickly and having tight control over the purchase price may be the most essential factor.
- Buyer's sourcing strategy: There are two categories of buyers: optimizers, who cautiously map out the supply and select the best, and satisfied people in general, who select the first supplier who corresponds to their criteria.

- Buyer's purchasing decision-making process: This takes into consideration the purchasing company's decision-making procedures, such as power relations in the influence of production and marketing.
- The significance of the acquisition for the buyer.
- Attitudes towards suppliers.
- Organizational innovation: Some companies are more innovative and want to buy innovative products, Others want to stick to technologies with which they are comfortable.
- Personality traits: In the end, the buyer is human. Many personal traits affect a person's decision.

The supplier analyzes its customers in the same way the buyer analyzes its suppliers. Although, some customers belong to the critical group, others to the group of casual customers. So, what makes a buyer attractive to a supplier? For different suppliers, varied factors are important when looking at buyer attractiveness. If a supplier's core competence is technical innovation, attractive is likely to look different than in the eyes of a supplier competing with low production costs. An attractive customer can be a company that is geographically close. Or it may be a company that is already being cooperated with, since it is easier to improve a relationship with such. The attractiveness may also lie in the company's intention to outsource its operations. Each supplier must decide the attractiveness factors and assess the importance of each one (Tanskanen & Aminoff, 2015).

## 2.5 Supplier market through the eyes of the acquiring company

Supplier market research can be conducted as an ongoing survey or as a one-time event, such as when combined with the supplier selection process. Depending on the situation, its focus might be either short or long-term. Qualitative data for research may be gathered based on opinions, experiences, and various points of view. Quantitative data, on the other hand, is based on numerical facts (Van, 2014).

In order to conduct effective supplier market research, reliable sources of information are needed to obtain comprehensive market information. Within the company, information may

be limited to familiar practices and suppliers. On the other hand, there are several other sources of information. It may include press releases, financial projections, conferences and other supplier connections, intermediary companies, corporate directories maintained up to date by companies and other sources. It is critical to understand where the market is headed and how the company responds to market changes (AlMaian et al., 2016).

When selecting a supplier market, psychological distance to the supplier market is typically a crucial element. There are various prejudices connected with certain areas, and there are concerns about the ability to generate quality products in particular. When looking for a supplier from overseas, the first step is often to seek a nation that has a comparable culture to the purchasing company. Nevertheless, by merging several technological focuses across the world, an efficient and cost-effective supplier base may be established (Weidner, 2022).

## 2.6 Summary of sustainable supplier and market evaluation

The supplier selection is primarily affected by the component's significance to the company's strategy. In procurement, the strategic component should receive more attention than normal. It is also possible to select strategic components in-house, but it is also important to remember that the in-house manufacturing decision is a long-term strategy, while external sourcing is less restrictive. When making a purchasing decision, product specifications have a considerable influence on cost formation and, indirectly, in selecting the best supplier.

Potential customers are viewed as having various values by the supplier of the company. It goes to tremendous measures to win over a customer and even goes as far as to become their supplier. Thus, for the buying company to choose the most qualified suppliers for itself, it needs to have the proper attraction elements. Effective supplier market research is essential for the buying company to understand what is available, what the risks are, and how effectively to direct its sourcing efforts.

## 2.7 Supplier relationship strategy

The management of supplier relationships has been extensively explored. There are several ways to approach the topic. Depending on the quantity of suppliers and the configuration of

the supplier network, supplier relationships can be categorized. In addition, the quality of the relationship and its structural components, as well as cultural and geographical factors could be used as the basis for classification. The purpose of this chapter is to give a summary of the topics covered in the supplier relationship strategy. The relationship between the supplier and the customer is the chapter's main topic.

## 2.8 Supplier selection base

The supplier selection process forms the core of the company's procurement strategy, providing the foundation for successful and sustainable business operations. This inclusive process includes an extensive review of potential suppliers based on a variety of crucial variables such as quality, reliability, collaboration, cost-effectiveness, and compliance with ethical and sustainable responsibility (Schumm, C. Z. & Niehm, L. S. 2023). A strong supplier selection base includes these characteristics, allowing companies to actively select suppliers who do not only meet current demands but also contribute to long-term prosperity, resilience, and sustainable practice.

### 2.8.1 Supplier criteria

Supplier criteria are critical factors that companies evaluate when selecting suppliers for business collaborations. According to Taherdoost and Brard's (2019) analysis of the supplier selection criteria include several elements such as:

- Quality: The supplier's capacity to regularly manufacture products or services that comply with or exceed expectations for quality.
- Price: The cost of products or services sold by the supplier and price aspects like price structure, terms of payment, and total cost of ownership (TCO).
- Reliability: The supplier's performance of delivering on time, fulfilling orders, and responding to requests or challenges.
- Capability and capacity refer to the supplier's ability to fulfil the company's manufacturing capacity and technical proficiency.

- Sustainable and ethical practices: The supplier's dedication to ethical business practices, environmentally friendly operations, and corporate social responsibility (CSR).
- Innovation and technology refer to the supplier's capacity to develop and adapt to changing trends in the market, as well as its application of technology capabilities.

## 2.9 Multiple suppliers or a single supplier

The decision to have several or a single supplier is an important part of a company's procurement strategy and is influenced by a variety of factors. Each strategy has pros and cons, and the best option is often determined by the company's specific objectives and circumstances. Western-based companies have traditionally used different suppliers for every component. The current tendency is to use timely manufacturing methods more often while simultaneously decreasing the number of suppliers (Costantino & Pellegrino, 2010).

Using one or more vendors can be further divided into two groups. The supplier relationship can be long-term or short-term. In the short term, selecting only one supplier may save costs since only one supplier must make the necessary investments. When there is only one supplier, communication between the two parties is likely to be more efficient. Dependence on a single supplier, on the other hand, generates uncertainty in the purchasing company, both short and long-term. If the supplier unexpectedly becomes unable to supply, the buyer must find a replacement supplier as soon as possible. Own production is at substantial risk of disruption. In a single-supplier situation, the problem is always a lack of competitive pressure on the supplier. The advantage of a multiple supplier environment is that it is easier for the buyer to compare market developments and take advantage of them effectively (Saunders, M. 1997).

On the other hand, using several suppliers could make it difficult for suppliers to develop their own strategy in the long term, resulting in common negative effects for both sides. For example, the supplier may be: Less interested in supplying customers with their own technological insights for fear of disclosing the knowledge to competitors (Saunders, M. 1997).

In the long-term, the strategy of using a single supplier can bring benefits in the form of consistency of the components to be supplied. Although several components bought from

the supplier would meet the requirements of the product specification, there may be some differences that complicate the manufacturing process. Logistics operations can often be made more efficient when working with only one supplier. Convergence of relationships may also result in innovative product concepts and collaborative investments. Additionally, savings in relationship management may be realized when both sides learn one other's working styles. The use of several suppliers in long-term partnerships is essentially justified for the same reasons as it is in short-term relationships. The use of several suppliers is viewed as a market-stimulating technique, with suppliers aiming for constant improvement (Saunders, M. 1997).

In the end, the decision on utilizing several or a single supplier should be based on the company's business objectives, risk tolerance, and the scope of its activities. Some companies achieve a balance by using one main supplier and secondary or backup suppliers to reduce potential disruption. This approach combines the advantages of both options, allowing flexibility while minimizing risk.

#### 2.9.1 Exploring the practicality of adopting a single supplier strategy

According to the Deloitte 2022 survey, only 30% of the private sector and 37% of the public sector reported pursuing a single supplier strategy. However, 70% of the remaining private sector and 63% of public sector reported that they prefer multiple suppliers. Companies believed they had improved supplier performance. Poorly managed suppliers were dismissed, and the remaining suppliers' management became more efficient. Using a selected supplier is a method that falls in between single and multi-supplier systems. The survey indicates that components of lower strategic importance are overseen in this way. In this case, the buyer evaluates the suppliers before selecting a few as preferred suppliers, and then primarily collaborates with them (Harrison & Thompson, 2022).

Under certain conditions, a single supplier strategy can be effective. It provides simplicity in management, constant quality control, and the possibility of solid and loyal collaboration. However, it is not without disadvantages, such as dependency and restricted negotiation leverage. Nevertheless, the implementation's success is determined by requirements such as the nature of the industry, the supplier's reliability, and the company's risk tolerance. Some

companies succeed by balancing a single supplier with emergency strategies or backup suppliers to reduce potential risks.

### 2.9.2 Supplier consolidation

Supplier consolidation refers to a company's decision to reduce the number of suppliers it collaborates with while maintaining the volume of products and services purchased. This approach seeks to improve the supply chain, increase efficiency, and provide a variety of operational and financial advantages (Sfiligoj, E. 2017). However, this strategy has advantages and disadvantages. Pros include ease of control over the supplier process, increased supply efficiency, cost savings, and collaboration. Cons include a restricted number of suppliers, risk of supply disruption, and a lack of opportunities for innovation and development that multiple suppliers could provide.

In the UK, according to Gartner's press release, the reduction of the number of suppliers is growing in many industries. A recent survey conducted by Gartner shows that companies are aiming to reduce the number of suppliers. As a result of the supplier consolidation the survey found that 57% of the companies are working with fewer than ten suppliers (Goasduff, 2022). However, it is essential for companies to have a backup supplier for each component, who would be able to deliver quickly, if necessary, in case of a malfunction at the primary supplier. Under normal circumstances, it is also important to have a good relationship and well-established active agreement with these backup suppliers.

The company's supplier risk must be as low as possible and generally identified within the company for a stronger competitiveness strategy. The demands of customers have changed because of higher competition among companies. A company must be able to meet customer expectations to improve its chances of long-term success in an environment of intense competition.

Supplier consolidation can provide many advantages, but it demands careful planning and deliberate strategy. The selection should be in line with the company's objectives, risk tolerance, and industry requirements. Successful consolidation involves finding the correct balance between efficiency improvements and risk management (Sfiligoj, E. 2017).

### 2.9.3 Network sourcing

The term Network sourcing can be understood in various concepts. Here it refers to two types of models, models of horizontal networking and vertical network acquisition (Tomeczek, 2022). In a horizontal network, many small or medium-sized suppliers in the same industry cooperate with each other to form a larger entity that can deliver reliably even if a single member is disrupted.

The principle of Japanese “keiretsu” network procurement is to reduce the number of suppliers in the acquiring company. This is conducted by combining material flows and directing them through just a few key suppliers to the buyer. The importance of these key suppliers is growing, and they must be able to effectively manage their own supplier field. The trend that has prevailed in recent years towards a radical reduction in the number of suppliers has been achieved through methods such as the Japanese network management often mentioned (Early, 2015). Figure 7 illustrates the Japanese the networking model.

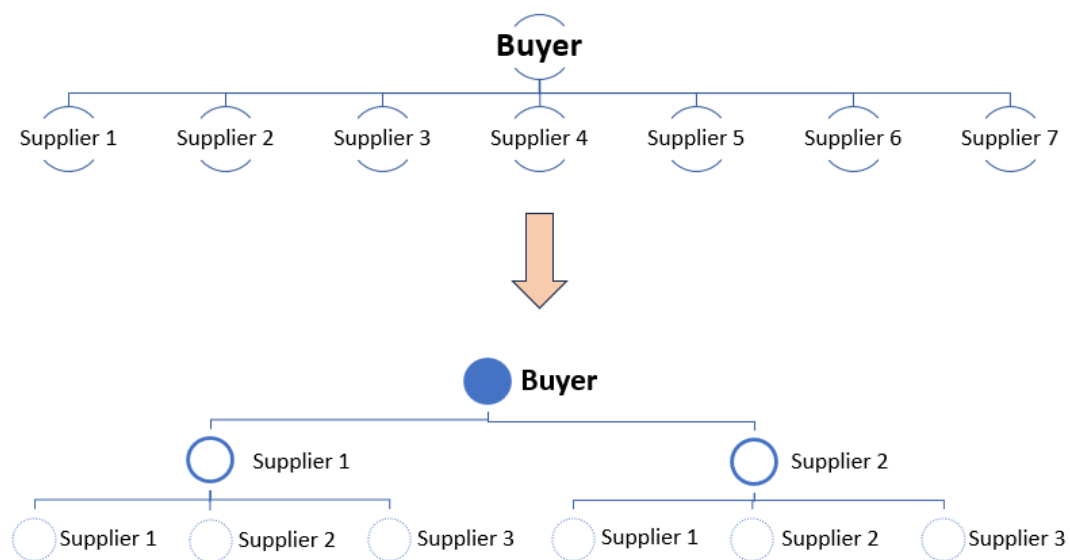


Figure 7: Principles of the Japanese network model (Adopted and modified from Early, 2015).

The network that drives the buyer to buy within the group, and supplier communities, which is probably much the same model as the horizontal network meaning it is mentions strategic alliances led a supplier and it is one of the buyer’s purchasing entities (Zeng et al., 2015).

#### 2.9.4 Global sourcing

The rising rivalry in the global market is one of the reasons for the more active search for supplier alliances. Finding a foreign supplier will be easier for the buying company. The advantages of global sourcing result in a more effective use of global capital resources, materials, and energy which is profitable for the company (Steinle & Schiele, 2008).

Global sourcing brings many advantages to companies, such as cost savings, access to advanced skills, and enhanced flexibility. However, it also carries with it logistical issues that can have a substantial influence on operations. These challenges include supply chain interruptions and time zone differences to quality control concerns and geopolitical risks (Steinle & Schiele, 2008).

According to Baily (Baily, Peter.1998), there are six reasons for entering the international supplier market:

1. The desired product is simply not available on the domestic market.
2. Product features, such as the level of quality proven by the final product specifications, are not accessible on the domestic market and can only be obtained on global markets.
3. There is insufficient domestic capacity to supply the demand.
4. For strategic reasons, another supplier abroad can be found to ensure the availability of the component.
5. The same component can be obtained from abroad in a smaller size at total cost due to lower wages, higher efficiency, exchange rates or higher production volumes.
6. A company may have a counter-trade obligation that requires it to buy from certain countries.

Global sourcing involves its own risks and can be divided into four categories (Shih, 2022):

1. Communication problems: Language and cultural differences, time difference, differences in standards, etc. An initiative-taking strategy that recognizes and overcomes language, culture, time zone, and technology obstacles is required for

efficient communication with suppliers. Companies can overcome these challenges and develop stronger, more productive relationships with their suppliers abroad by using approaches that improve clarity, understanding, and adaptation.

2. Logistical problems: Increasing complexity of transport, increasing distances, availability of spare parts, and emission and sustainability concerns. Delivery time is often seen as a critical factor when buying abroad. Geopolitical concerns and uncertainty complicate logistics even more. Political instability, conflicts, or changes in regulations within the supplier nation can all disrupt supply chains, resulting in higher prices, delays, and possibly the loss of sales potential businesses.
3. Problems with different policies and regulations: Cross-border bureaucracy and fees. International supplier issues resulting from different laws and regulations require an integrated solution combining legal expertise, strategic planning, effective communication, and technology innovation. By proactively tackling these challenges and adjusting to the changing regulatory landscape, companies can more effectively deal with the complex regulations of global trade and sourcing, guaranteeing compliance while maintaining efficient and strong supply chains.
4. Currency risk: This is especially relevant in foreign exchange markets, although there is no foreign exchange risk within the countries that use the same currency. Currency risk is a challenging issue that needs thoughtful consideration and effective risk management evaluation from companies engaging in global trade and sourcing. Companies can reduce the negative effects of currency exchanges by using ensuring measures, diversifying sourcing, and negotiating good agreements. This increases their resilience and consistency in the global market.

## 2.10 Supplier relationship

A partnership relationship is difficult to define, as there are several definitions. The power relations of the supplier relationship were described in the previous paragraph, and it was discussed about the extremes of power relations. There is a collaborative relationship between both. This is one definition of partnership. It may also be determined based on supply continuity and the number of companies' mutual interactions. Partnership agreements

are long-term, and collaboration occurs on many levels, although companies and companies stay separate.

According to Erridge (Erridge, 1995), there are several distinctive characteristics of partnership relationships feature:

- Supplier selection: Suppliers are not widely demanded, but a few significant suppliers are chosen and negotiated with.
- The agreement period: Long-term or short-term.
- Number of suppliers: One, two or few.
- Contract relationships: Flexibility and informality prevail. A partnership relationship is built on mutual trust.
- Communication with suppliers: Online or verbal communication is maintained, and paper handling is minimized.
- Common operations: There are several of them. Cooperation areas may include, for example, product development, standards, cost management, and funding.
- Negotiation: The goal of negotiations is to achieve a "win-win" outcome.
- Attitude toward quality: Maintaining a high level of quality is a common objective that will be achieved through collaborative efforts.
- Delivery processes: Close collaboration allows for timely deliveries in small quantities. In this case, safety stocks may become redundant.

The constant commitment of management to encouraging collaboration and transparency across all levels is the foundation of an effective alliance. A clear description of objectives that is understandable to all parties is critical, and to achieve this, a proactive rather than reactive strategy is required (Erridge, 1995).

The concept of partnership differs differently between Europe and Afrika, which is typically referred to as lean supply. Lean supply differs from a partnership in that the supplier and buyer have a more balanced relationship in which neither has a dominating position, and on the other hand in partnership the buyer is dominant. In addition, the specific links between companies, the government, and financial institutions have a considerable impact on the idea

of partnership. It is vital to highlight that the concept of lean supply has been integrated into the larger understanding of partnership within this framework (Erridge 1995).

The partnership is an effective method for addressing operational issues. By encouraging close cooperation with a properly selected supplier, supply stability is ensured, allowing mutually beneficial planning to anticipate challenges (Nenavani, J. & Jain, R. K. 2022). The common concern about price increases caused by reliance on a single supplier can be minimized and turned into an advantageous situation. Coordinating operating timetables promotes improved effectiveness in the supplier's logistics operations, lowering delivery costs.

When a buyer no longer actively seeks alternative suppliers on the market, it is likely to have better access to the supplier's technological knowledge. Joint product development projects can be carried out. The most important benefit of a partnership is usually considered to be an improvement in quality. One of the reasons for this is the introduction of the concept of 'total quality'. Both parties have a better opportunity to influence each other's ability to produce quality and suggest improvements.

## 2.11 Supplier relationship management

The exchange of products, services, and financial assets between two companies is a substantial and practical part of a supplier relationship (Nenavani, J. & Jain, R. K. 2022). However, the basis of the relationship remains an abstract idea that surpasses physical interactions.

Supplier Relationship Management accomplishment is essential for overall business success. In a time of continuous supply interruptions, having the ability to create and sustain strong supplier relationships is becoming increasingly important in attaining organizational success. A properly organized strategy helps achieve the goals and success of buyers and suppliers. As a result, success in supplier relationship management is critical for companies (Thakkar et al., 2007,). In a supplier-buyer scenario, potential visual representations of relationship aspects include (Team, V. 2023):

- Key elements: it refers to the relationship's fundamental elements such as trust, communication, collaboration, and common objectives.

- **Data Analysis:** Accurate and timely data analysis is critical in developing strategies, refining processes, optimizing agreements, and reviewing performance indicators. Companies must have access to up-to-date information on their whole supply chain operations, including supplier capacity, delivery dates, cost changes, and quality control requirements. Using business analytics or intelligent robotics allows companies to obtain visibility into their processes quickly and easily.
- **Establishment of clear objectives:** It is critical to define the scope of a successful supplier relationship management strategy to be consistent with the company's objectives. It is critical to adapt objectives to distinctive organizational demands, whether it is cost-cutting measures or improving supplier communications.
- **Process development:** Clearly defined processes for identifying and managing supplier partnerships act as a foundation for long-term success and growth. Defining process guidelines, duties, rights, and responsibilities across the company is necessary for establishing specific requirements for interactions with suppliers. Implementing criteria to evaluate suppliers based on industry standards promotes long-term successful relationship.
- **Partnership formation:** Developing strong operating relations with suppliers encourages buyers and suppliers to collaborate on initiatives like as innovation, cost reduction, and risk management. Using technologies such as collaborative platforms and new negotiating instruments accelerates the terms of the agreement.
- **Improved transparency:** A key element is supplier transparency. Access to real-time data on supplier performance enables companies to identify and resolve possible problems before they become worse. The development of indicators to track supplier delivery, cost, quality, sustainability, and risk management improves operational transparency and allows for quick adjustments to changing conditions.
- **Strong communication channels:** Consistent and transparent communication between buyers and suppliers is critical. Open talks about successes and failures promote a collaborative environment based on trustworthiness. Maintaining regular communication through meetings, reports, emails, and video conferences creates a culture of transparency and trust. Also maintaining continuity of the regular communication rather than being reactive only in crises.

- Improved performance monitoring: Using accurate evaluation solutions enables firms to track supplier performance regarding key performance indicators and receive updates in real-time about possible interruptions.

## 2.12 Balance of power in the supplier relationship

The power dynamic between buyer and supplier is difficult to determine. There are many theories to recognize it, but none of them can establish the current power relations clearly. Power relations are determined on a market-based basis in the early phases of a business partnership when companies are unfamiliar with one another or each other's personnel. In this case, typical market mechanisms work, and power relations are established as a result.

There are three factors that determine the location of the supplier relationship, uncertainty, frequency of deliveries and amount of investment per delivery. The most critical factor is uncertainty. The higher the uncertainty regarding the relationship's continuation, the more market-driven the activity will be. The term "delivery frequency" relates not only to the frequency of occurrences, but also to the overall volume. This may have various effects in different contexts. When there is a shortage in the market, the supplier has an advantage, but when there is oversupply, the buyer has an advantage. The degree of investment per supply demonstrates the parties' specialization in each other's supplies/needs. This has an impact on the buyer's ability to locate a substitute supplier, as well as the supplier's ability to find a replacement for the buyer (Chang & Lin, 2019).

Market-driven relationship-based focuses on the control relationship to be gained during negotiations. It requires thorough preparation within the negotiating team as well as familiarization with the other party's interests in the discussions. It is critical to uncover things that are significant to the opposing party in the negotiation, which may then be used as negotiating instruments to maximize the negotiation outcome (Chang & Lin, 2019).

Business relationship management tends to become non-market-driven over time. The relationship develops either in the direction of a hierarchical or partnership relationship, although both have some common features (Morsy, 2014). Graphically, the situation could be understood as shown in figure 8. The type of relationship can be located anywhere inside the contours of the triangle.

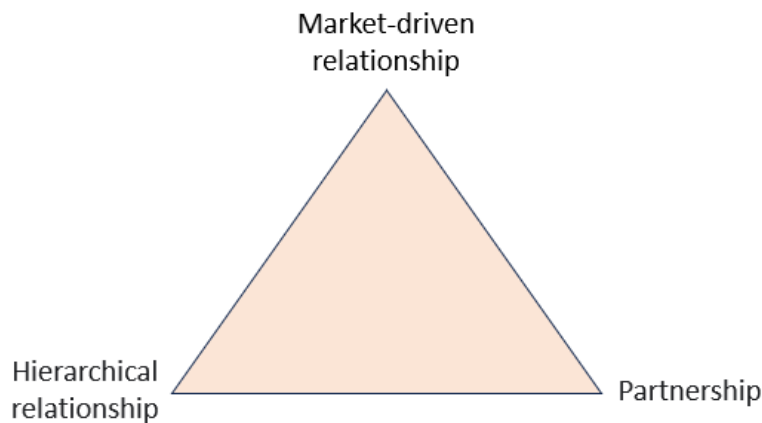


Figure 8: Power relationship between buyer and supplier (Adopted and modified from Morsy, 2014).

Morsy's (2014) study defines four types of relationships along the transactional-collaborative continuum based on trust, regularity of interaction, the size of the supplier base, length of a relationship, extent of supplier engagement, and level of data sharing.

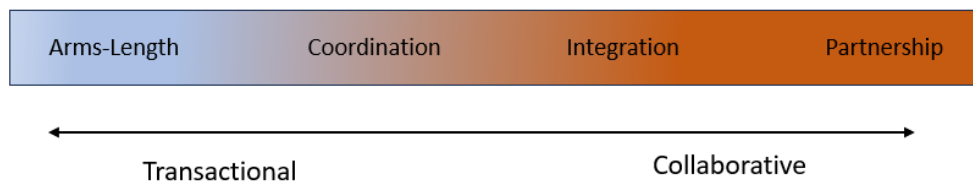


Figure 9: Buyer-supplier relation continuum, adopted and modified from Hebatollah Mohamed Morsy (Morsy, 2014).

A business relationship in which buyers and suppliers operate freely without one party influencing the other is referred to as an arm's length transaction. Arm's length transactions maintain that both parties behave in their own interest and are not pressured. For the sake of equality, both parties typically have equal access to data about the transaction in question. Arm's length relationships are short-term and need little interaction, low engagement, insufficient trust, and increased independence between suppliers and buyers (Morsy, 2014).

Relational coordination refers to the management of dependency not just between tasks but also between the individuals who carry them out. The idea identifies three relationship features that encourage the highest levels of coordination and performance. The three essential elements of coordination are a common goal set by both buyers and suppliers, shared data that allows everyone to understand the common goal and process, and mutual respect to overcome any status obstacles that may occur (Hoffer Gittel, 2012).

Through investments that rely on a smaller base of suppliers, coordination transactions can move beyond the arm's length transactional relation to a more strong and close type of relationship. Coordination of the supply chain is an efficiency development initiative that reorganizes decision-making authority, efficiency of operation, and collaborative assets across those involved in the supply chain (Morsy, 2014).

Companies must first create a solid integration between their departments, operations, and functions to create an internally unified, coordinated process before they can participate in an organizational collaboration. Supply chain could become unique, innovative, and effective because of the integration of the processes used by suppliers and buyers. Establishing cooperative buyer-supplier relationships through integration demands a high level of dedication, reliability, and data exchange (Morsy, 2014).

A supply chain partnership is a stable, long-lasting, and cooperative relationship that develops from regular encounters, communication, and financial transactions between suppliers and customers. Buyers and suppliers will form some sort of partnership when they are more interested in consistent, long-term collaboration (Morsy, 2014).

#### 2.12.1 Reverse marketing

The strengthening of supplier ties signifies a shift away from the traditional buyer-supplier dynamic and toward a more connected supply chain environment. Nonetheless, supply chains are complex and constantly changing. They move through several stages, starting with initiation and eventually fading. As a result, the relationship could continue as a typical business relationship. On the other hand, can constantly develop adopting new qualities that allow them to thrive and remain close (Dwyer et al., 1989).

Reverse marketing can bring significant benefits, for example, in a situation where the buying company is smaller than the supplier and is therefore not inherently the most interesting potential business partner for the supplier. Marketing by the buyer towards the supplier supports a close partnership relationship, which is why companies with partnership experience best adopt a new way of thinking (Blenkhorn & Banting, 1991).

### 2.12.2 Market failure

The biggest market failures from the buyer's perspective are cartels and monopolies, as well as unexpected price changes among a certain number of suppliers, and similar statements about the justification for price changes. Unprofessional language in negotiation situations or suppliers frequently gathering for work are all signs of a cartel (Napel & Welter, 2023).

Fighting a cartel is a challenging task for the buyer, and it is sometimes more profitable to cancel the entire selection process and repeat it with a different path forward. However, there are some ways to reduce the effects of the cartel, such as being unpredictable in the event of market movements, requesting offers on different criteria from different suppliers, requesting offers for a third party through another party such as a consultant, creating time pressure, offering purchases among several suppliers, or selecting new suppliers entirely outside the cartel (Napel & Welter, 2023).

Another market disruption that can result in additional costs for the buyer is monopoly. Initial attempts can be made to avoid monopolies by purchasing from a broader market and avoiding pricing as the main consideration. The monopoly supplier's dependence on the buyer can be increased by centralizing purchases. Also purchase agreements can be designed so that they are one-time incidents that do not obligate the buyer to make additional purchases (Finley, 2023).

## 2.13 The influence of supplier selection on company performance

Supplier selection has a significant influence on company performance in a variety of aspects. Effective supplier selection processes are linked to increased operational efficiency, cost savings, and improved product quality (Kannan and Tan 2002). Companies that work with reliable and skilled suppliers can optimize their supply chain processes, reduce manufacturing delays, and more effectively satisfy customer demands. Furthermore, selecting suppliers who share the company's strategic goals and values can help with long-term competitiveness and environmental sustainability (Yadavalli et al. 2019).

Suppliers who are committed to sustainable practices, for example, can help businesses reduce their environmental effects and improve their reputation. Furthermore, effective

supplier selection can promote innovation and product development, allowing businesses to offer new products to the market quickly and maintain a competitive advantage (Melander 2018). The supplier selection process has a direct influence on company performance by affecting effectiveness, environmental responsibility, innovation, and, eventually, profitability.

The process of selecting suppliers has a significant impact on how well a company performs in several areas, with the environment receiving particular consideration. Securing reliable and high-quality suppliers is essential for ensuring the company's environmental footprint, in addition to other benefits. Through accurate evaluation of suppliers' environmental practices, including their sustainability initiatives, waste management strategies, and compliance with environmental regulations, companies can effectively manage the risks associated with pollution, depletion of resources, and non-compliance with regulations, all the while promoting improved sustainability within their supply chain. According to studies, selecting suppliers who practice environmental responsibility can boost a company's reputation and environmental performance (Villena & Gioia, 2020).

Incorporating environmental criteria into the supplier selection process is more than just compliance or ethical obligation; it is a strategic demand for companies seeking to prosper in an increasingly sustainable marketplace. This highlights the ability to create positive environmental results while also strengthening organizational resilience and competitiveness. Companies must emphasize environmental issues in their supplier selection processes to gain the full range of benefits from sustainable supply chain management (Rezaei et al., 2016).

It is clear that supplier selection is critical for an acquiring company's competitive success across various sectors. Companies that focus on new product development, quality, and cost capabilities can have a direct effect on their own product innovation, quality, and competitive price when making procurement decisions. This resource-based approach enables acquiring companies to improve their performance by utilizing the expertise and resources of carefully selected suppliers. Supplier partnerships and development can be considered to be potential mediators. While the direct effects of supplier selection on company performance have been frequently pointed out in this thesis, the indirect effects via supplier processes of integration are not significant. This emphasizes the importance of supplier selection as a powerful source of competitive advantage, but supplier development and partnership do not give

further performance gains beyond those obtained through strategy supplier selection (Koufteros et al., 2012).

## 2.14 Summary of supplier relationships

For buying strategic components, both single and multiple supplier approaches are reasonable. The disadvantages of relying on a single supplier include supply disruptions and increased costs, while the positives generally revolve around delivery quality. Making use of both strategies is accomplished through network sourcing, which embraces the internationalization of procurement. This growth offers not just benefits, but also new procurement design elements intended to avoid challenges.

Regarding the nature of partnerships-suppliers' relationships, the agreement is still challenging. In general, it indicates a closer relationship based on mutual trust and objectives between the buyer and the supplier. In comparison to traditional relationships, collaborative activities encourage a brighter and more transparent exchange of information with the aim of accomplishing these objectives.

Although a partnership relationship has many advantages when utilized properly, using it in the wrong situation involves significant risks. A partnership doesn't form quickly; it frequently takes years to become stable. In order to keep the relationship from weakening maintaining it also requires financial commitments and constant maintenance.

### 3 Methods

This section contains an introduction to the case study, outlines the research methods, and introduces the analytical implementation. This M.Sc. thesis was conducted as a qualitative study with a focus on one company, making it a case study.

#### 3.1 Case company



Raute corporation produces equipment for the LVL (laminated veneer lumber) and innovative industries. The company's products make wood-based plates and bars for the building sector. The mill's and the LVL production plant's whole production process can be overseen by Raute's equipment (Our journey Raute Oyj 2023).

Raute's history goes back to 1908 and its headquarter is in Lahti-Nastola, Finland. When it was founded as Lahti Rauta- and Metalliteollisuus Oy and started producing woodworking tools. Although the company has produced a wide variety of equipment throughout the years, plywood machines have been a product since the 1930s (Our journey Raute Oyj 2023). Raute offers a wide range of solutions for large-scale projects and production lines of entire factories, as well as machines and equipment for automation, machine vision and analysis technologies (Raute corporation 2023). Raute was listed on the Helsinki stock exchange in 1994 (Stock Exchange Information 2020).

During its history, the company has developed from a small workshop to a global market leader. Raute operates in ten different countries, with factory operations in Finland, Canada, China, and the USA with over 350 customers worldwide (Raute globally 2023). Raute is a technology and service company serving the wood products industry globally, whose most important customer industries are the plywood and LVL industries. Raute's customers are companies operating in the wood products industry, whose wood products include veneer, plywood, and sawn timber. Favoring renewable raw materials and materials in construction (Organization, 2023).

In 2022, Raute's net sales were 158.3 million euros and it employed approximately 778 people around the world (Arvopaperi, 2023). Next year the nets sales are expected to be much higher because Raute received an order of 93 million euros from Metsä Wood, which is part of Metsä Group. This order is the biggest order in Raute's history. Metsa Wood is expanding its LVL capacity by 50% by building a new Kerto mill in Äänekoski, with an annual output of 160,000 cubic meters. Raute's technology is used for veneer peeling and LVL pressing (Organization, 2023).

The company received three medium-sized orders at the end of 2023, including Lumin, Latvijas Finieris, and Thebault. The building industry has seen a slowdown, resulting in lower demand for softwood and hardwood plywood. Market instability has impacted demand for single production lines and spare parts. Despite these obstacles, there is continued demand for mill-scale projects and technological advances (Q3/2023 Interim report January-September 2023).

### 3.1.1 Reasoning behind selecting Raute corporation for the case study

Raute was chosen as the focus of this case study because of its significant involvement with multiple suppliers, both domestically and abroad. Raute is a major participant in the industry, operates within a complicated network of suppliers that includes a wide range of products and services needed for its business operations. Raute corporation, with a global footprint and a strong supply chain, provides a compelling case study for understanding the dynamics and complexities of the supplier selection process.

Although the literature review section addressed many aspects of the supplier selection process, it's important to note that the findings may not be directly applicable or generalizable to a company like Raute. Raute operates in a distinct industry landscape with specialized organizational goals, beliefs, and operational limitations. As a result, despite existing literature giving significant theoretical frameworks and considerations, these findings must be adjusted and adapted to Raute's circumstances and objectives. Raute can develop a supplier selection approach that is tightly aligned with its strategic goals, processes, and industry dynamics, ensuring the company's best outcomes.

The decision to focus on Raute was made due to its importance in the supply chain landscape and the potential to learn about many areas of supplier selection, relationship management, and performance evaluation. This case study evaluates Raute's approach to sustainable supplier selection to identify best practices, obstacles, and opportunities connected with sourcing from diverse suppliers in different parts of the world.

Nevertheless, the choice of Raute for this case study provides a comprehensive and effective evaluation of supplier selection methods, shining light on the details and complexities of purchasing from different suppliers in a globalized market. This case study intends to contribute to a better knowledge of effective supplier selection and its consequences for company performance and competitiveness by analysing Raute's environmental aspects of the supplier selection process.

### 3.1.2 Research design

This study was conducted qualitatively. The goal of qualitative research is to better understand what is being studied.

This is a case study since it focuses just on a specific company. Case studies seek to understand the occurrence comprehensively and they allow for uncertainty of occurrences while also allowing for generalizations (Gohar, Abrar, and Tariq 2022; Rashid et al. 2022). The case study explores the topic of the research problem in its natural setting, defining its characteristics as completely and precisely as possible. The case study aims to describe cases frequently focusing on the meanings, experiences, observations, and views of individuals (Coombs, H. V. 2022).

### 3.1.3 Data collection

For primary data collection, semi-structured interviews and discussions were chosen for the research because they allow respondents to provide their views of the topic while also emphasizing the meanings they attribute to the topic (Sumbal et al. 2021). Secondary data such as archives, websites, and other company sources were also used for the research. In this study, questions (Appendix 1&2) were presented to the respondents. The discussion with a case study company representative took place in Microsoft Teams in

September 2023. In response to the questions, one person preferred to answer in Finnish. Translations of the responses are provided in the same Appendix for reader convenience.

In this research, content analysis and thematic analysis were applied as an analytical tool. The goal of content analysis is to understand the supplier selection process and to evaluate in order the research to be presented in a summary (Luo, 2023).

#### 3.1.4 Selection of respondents

Respondents for the case study were chosen using a partially convenient sampling strategy, which considered both participant availability and roles within the case company. Although convenient sampling has been criticized for potential biases, it can be useful and efficient in some research contexts (Goldberg et al., 2019). In this case, using convenient sampling enables the inclusion of individuals who are easily available and have valuable perspectives on the research problem.

Nevertheless, the case study's respondent selection takes a practical approach, mixing sampling convenience with strategic consideration of participants' roles within the case company. This approach option seeks to maximize the efficiency and effectiveness of data collecting while ensuring the variety of findings obtained from different stakeholder perspectives. The case study aims to provide a comprehensive and detailed explanation of the research questions by carefully selecting and including respondents.

- Case study respondents

<b>Name</b>	<b>Role in the case company</b>
Kai Huuhtanen	Sourcing and operative purchasing manager
Satu Kaivonen	ESG Manager
Hanna Vilppula	Previous purchaser, currently R&D member

### 3.2 Sustainable supplier selection in the case company

The underlying focus of the study is a comprehensive evaluation of the sustainable supplier selection process at Raute. The chapter title emphasizes the major influence applied by

suppliers. Previous discussions in earlier chapters have centered on the establishment of large-scale policies, primarily within the organizational framework. This shift of emphasis goes deeper into the technical aspects necessary for the implementation of this complicated process.

Throughout the journey of the study a comprehensive evaluation has been done to comprehend the complete core of the supplier selection process. Levels of complexity within this process have been uncovered in each chapter, progressively exposing the complicated processes at work. The previous discussions, rooted in the field of organizational policies, have shed light on the macro-level decision-making processes, often shaped within the boundaries of the company itself.

But these macro-level discussions are not what this chapter is about. It moves into the area of the concrete and observable elements of the supplier selection process. Here, the focus is on the technical details, revealing the small implementation elements that tie the whole thing together. From the general principles of policymaking to the smaller details of implementation, supplier companies' position and influence become increasingly clear.

The shift in focus is crucial because it closes the gap between theory and applied part, shedding light on the practical implementation of these comprehensive policies and decisions made within the company. The key to this research is figuring out how these technical specifications appear to direct the supplier selection process.

The focus of the chapter on the technical implementation aspects is a crucial point that improves our understanding of the supplier selection process from strategic decision-making to tactical implementation in the operational field. It underlines how important it is to recognize and manage the complicated operational elements that support the relationship between companies and their suppliers.

Raute's strategy is to face the market with quality and sustainable products, short delivery times and customer-oriented service. The customer-oriented service is intended for well-tailored end products and has driven strategic components to a wide selection. Together, these factors have led to strategic components' high inventory levels and, in a few cases, inventory losses when the product is gone out of production. When designing a product, the aim was to narrow strategic components' supplier selection. This is achieved by increasing

strategic component types to such an extent that new suppliers and thus cost savings applying becomes topical.

Nevertheless, when determining a procurement strategy, one of the most important questions is: "What are we actually acquiring?" Related to the same set of problems is the question: "Do we want to buy, or should we perhaps make the component ourselves?" These questions are tools to determine the strategic components and the importance of the specification given to the product. This is discussed in more detail in this chapter.

## 4 Findings

The findings section of this case study provides comprehensive details about Raute's supplier selection process, answering the research questions presented. It also provides analysis and evaluation of how Raute selects its suppliers to guarantee alignment with its strategic objectives and corporate values.

- **How does Raute corporation selects its suppliers to ensure alignment with strategic objectives and corporate values?**

The case company's supplier selection follows a single well-defined strategy approach. Based on interviews and interaction with the case company as a purchaser it can be determined that the selection of suppliers goes according to the same formula for all suppliers. Referring to the supply chain and logistics development manager “all potential suppliers go through all the various stages of the selection process. Exceptions are only for small one-time purchases.” Figure 10 shows the process of selecting and evaluating the supplier of the case company. However, the supplier selection and evaluation processes are rather substantial due to the company's numerous acquisitions. They are different and as a result, the qualities required by suppliers are also different.

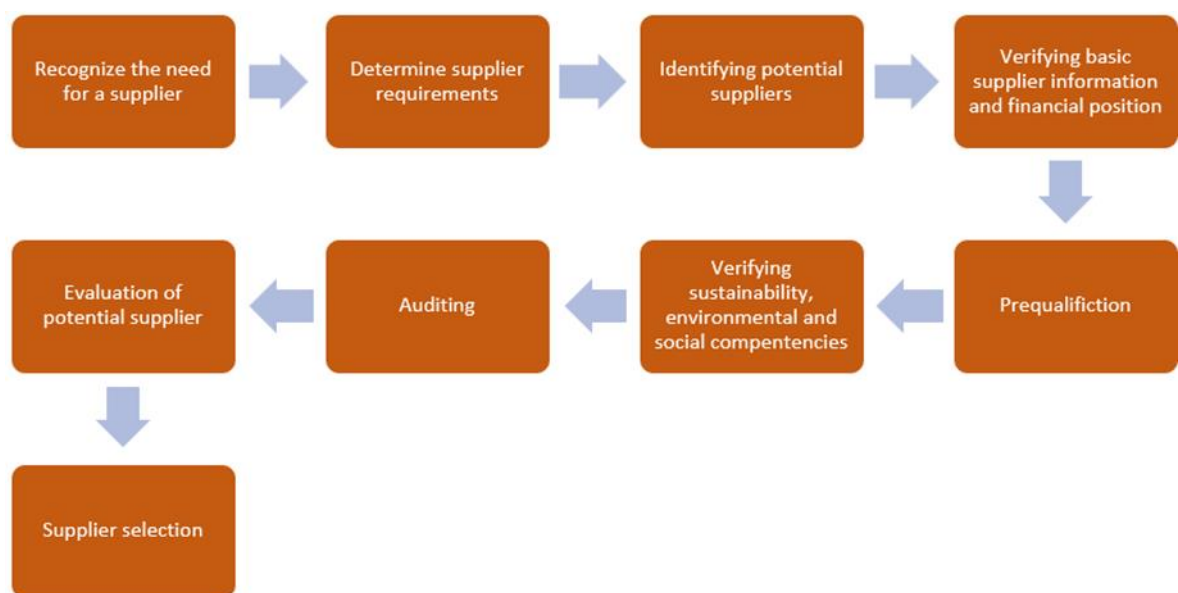


Figure 10: Supplier selection process in the case company (Adopted and modified from Stojanov & Ding, 2016).

The process of selecting suppliers begins with recognizing a need for a supplier. The need typically comes from product development projects, after which the necessary features and business objectives of the product to be purchased are established. Because the companies' products are so different, the features needed for the products, and thus the specifications required from the supplier are also very much different. For example, the company manufactures both technological equipment and building sector appliances, nevertheless, the product requirements and specifications differ significantly between the two categories. As a result, the criteria for selecting suppliers of technological components will differ from those for selecting raw materials for use in the building sector. Therefore, each requirement is considered separately, and the general required criteria are not used in the selection process. The criteria for the product are developed in collaboration with the product development team and the company's overall business strategy.

Supplier selection criteria are a vital part of the supplier selection process and can be used to provide an innovative framework for the overall supplier selection. In both the theory and applied parts, we were able to identify several selection criteria used in supplier selection, as well as what kinds of selection criteria should be used in relationships with suppliers across product categories. Aside from the level of the supplier relationship, additional elements influence the selection criterion. Furthermore, one of the aspects influencing the selection criteria in the case company is the prevention of risk. When the case company wants to achieve high levels of customer satisfaction, it must provide trustworthy products to clients at the proper time. The case company aims to ensure that production could proceed smoothly and without interruptions, therefore supply security and the suppliers' financial position became essential selection criteria. The evaluation of the financial position seeks to ensure the continuation of collaboration. This ensures that the supplier company can deliver the product or service in the future.

When looking for a new supplier, it is essential for the case company to determine if there is a suitable supplier in the current supplier stock. This helps minimize the supplier stock and allows for more focused purchases of specific suppliers. The goal is to build stronger and longer-term collaboration relations with current suppliers, which is why new suppliers are rarely purchased. When looking for a new supplier, the goal is to find long-term, diverse, and developing suppliers. The company often knows directly which suppliers to contact

when purchasing from a new supplier because it is always evaluating the supplier market, mapping it out, and identifying potential suppliers.

Once potential supplier is identified, a confidentiality agreement is signed if it is necessary, most of the suppliers does not have to sign a confidentiality agreement. It is important to keep in mind that the company's products are technologically advanced, and it is critical to ensure data confidentiality before engaging in business discussions. The next step is gathering the supplier's basic information and financial position.

Basic information is gathered from the potential supplier, and financial information is obtained from general databases. bankruptcy, the ability to pay, turnover, staff members' size, and level of debt are all factors to consider. Following this, the supplier's general suitability and interest in the case company is evaluated.

The evaluation process evaluates potential suppliers' sustainability, environmental, and ethical practices. This essential step indicates the case company's commitment to collaborating with suppliers that share its values. By evaluating these standards, the company aims to form partnerships with suppliers who not only meet operational criteria but also share their ethical and sustainability values. This strategic alignment promotes an integrated commitment to common values across the supply chain, resulting in a more sustainable and value-driven business environment.

Utilizing the information gathered in the previous steps, the potential supplier's basis is carefully evaluated. Raute's sourcing and operative purchasing manager Kai Huuhtanen underlines the necessity of performing audits to ensure long-term collaboration. This includes on-site visits to potential supplier facilities to evaluate quality and production standards to ensure they meet the company's requirements. Following this evaluation, supplier proposals are sent out to the potential supplier, and the responses are carefully reviewed. The final stage of this highly demanding process is the supplier selection stage, which is made easier using a scoring chart by the case company. This deliberate approach guarantees that supplier selection is not solely based on specific criteria, but rather a comprehensive evaluation of many factors to ensure a successful collaboration.

- **How does the selection process influence the sustainability practices of the company?**

The case study found that the most critical selection criteria for the case company were environmental, sustainability, ethics, and responsibility. Furthermore, the primary selection factors included the supplier's quality, technology, supply security, and reliability. Raute's sourcing and operative purchasing manager Kai Huuhtanen point out that while sustainability has become a fundamental aspect of company operations, it has also become an essential factor for supplier selection. He also emphasizes ethics as a supplier selection factor in the context of expanding globalization. The case company's values include a variety of concepts, including the environment, sustainability, accountability, and ethics. When the goal of a case company is to encourage sustainable and responsible operations, the supplier must likewise follow the principles mentioned earlier. The company's values therefore qualify as the most important factor in determining the selection criteria for the case company in the supplier selection.

Sustainability is recognized as a crucial aspect in allowing the company to maintain its competitive advantage and help the accomplishment of its growth objectives. According to the ESG manager Satu Kaivonen, Raute's strategic priorities are sustainability, quality, and continuous improvement. The company's goal is to compete on sustainability and maximize customer satisfaction as well as market share through sustainability and quality, therefore sustainability has become a key element when discussing supplier selection criteria. Based on this, we can conclude that the company's strategy helps to determine which criteria will be used to select the supplier.

#### 4.1 Insourcing or outsourcing

In terms of sustainability, deciding between domestic and overseas suppliers becomes a critical factor in the supplier selection process. Many businesses, inspired by a dedication to ethical and environmentally responsible operations (Ehsan et al. 2022) and are increasingly choosing domestic suppliers. This decision comes from a desire to support local economies, limit the carbon footprints involved with long-distance shipping, and ensure compliance with high environmental and labor standards that prevail in home markets (Kandil et al., 2022). However, if international suppliers offer a major benefit, such as cost-effectiveness or unique capabilities that are aligned with the company's standards and sustainability goals, they may be considered. To achieve the correct balance, each supplier's commitment to sustainability

must be carefully evaluated, including carbon emissions, responsible procurement, and ethical labor practices.

Raute's previous purchaser Hanna Vilppula discusses her strategic approach to supplier selection, emphasizing a preference for local suppliers whenever possible. This trend remains unless an international manufacturer, such as one from China, provides a significant pricing advantage. Particularly, the overall procurement strategy focuses on domestic purchases, which aligns with a broader trend.

Vilppula underlines the importance of reducing air cargo utilization not only for cost reasons but also in light of environmental issues, particularly climate influence. The approach involves combining purchases into bigger quantities, lowering transportation expenses, and reducing the environmental influence per unit. This reasonable strategy is demonstrated by the transition from weekly inventory intake to purchasing monthly requirements in a single unified effort. This approach reduces the frequency of air cargo, which is known to have a large carbon impact due to its reliance on fossil fuels. Furthermore, combining shipments into greater quantities reduces the overall number of transportation trips required, lowering greenhouse gas emissions from transportation activities. As a result, by executing this strategy, Vilppula demonstrates the case company's dedication to environmental sustainability by actively lowering the environmental effect of its logistical operations.

## 4.2 Supplier evaluation

Supplier evaluation is a continuous process that occurs at many levels of the company. The importance of the evaluation process increases during supplier selection because it immediately affects concrete decisions. Analysing issues associated with supplier selection evaluation requires looking further into the process itself. This includes establishing key criteria for evaluating potential suppliers and outlining the strategies that will aid in decision-making. Essentially, supplier evaluation is a systematic approach that evaluates and reviews the performance and capabilities of suppliers. The process goes beyond simply identifying suppliers; instead, it emphasizes a comprehensive valuation of many different factors. Establishing the evaluation criteria is crucial because it establishes the standards by which suppliers are evaluated. These standards frequently cover a wide range of aspects, such as

reliability, quality, cost, delivery capabilities, and standard compliance (Hamdan, S. & Cheaitou, A. 2017).

Furthermore, by ensuring a systematic approach and simplifying evaluations, the use of specific measures and processes improves the decision-making process. The measures provide a systematic approach for impartially evaluating and comparing supplier capabilities. They include analytical frameworks, performance measures, and supplier rankings. In the end, a successful supplier evaluation process helps make strategic, rational decisions and encourages the development of strong, successful supplier relationships.

### 4.3 Supplier evaluation process

The supplier evaluation process is an essential part of good supply chain management in today's complicated business world. This broad process includes the careful inspection and evaluation of potential and existing suppliers in order to ensure optimal partnerships, smooth operations, and market competitiveness. The establishment of strong evaluation criteria is crucial to the supplier evaluation process (Liu, H.-C., & You, X.-Y. 2021). Criteria are frequently modified in alignment with industry standards, organizational requirements, and specific operational needs. Supplier financial stability, production capacity, technological skills, ethical standards, and response to market dynamics are all examples of evaluation parameters (Hamdan, S. & Cheaitou, A. 2017).

The supplier's size is one of the prerequisites. At the same time, potential reputational considerations, and a history of being a reliable supplier are evaluated. The product's compatibility with the case company's operations is evaluated in the second stage. This can be accomplished by ordering a test sample from the supplier and carefully inspecting it. In the third stage, the actual supplier selection takes place (Sundtoft Hald & Ellegaard, 2011a). Various decision-support systems, which will be addressed in further detail later, can be used to help with this.

The general view recommends using suppliers themselves as primary information sources in supplier evaluation, which includes visits, interviews, marketing materials, and publications. However, due to suppliers' attraction to offer a more favorable image of themselves, verification with independent sources becomes critical. Limited access to

supplier paperwork, such as shipping and receipt records, service warranty details, and yearly reports, is required for this evaluation process. This approach, however, may face practical problems, such as potential information overlap from sources previously reviewed in the supplier evaluation (Maromonte, 1998). Other possible sources of information for evaluating a supplier include third-party evaluations. Weele Van outlines five approaches to supplier evaluation (Weele, A. J. van. 1997):

1. Performance criteria evaluation: Evaluate suppliers based on established performance criteria such as timely deliveries, technical consistency, and responses to challenges or complaints.
2. Analysis of risks and prevention: Perform a comprehensive risk evaluation to identify potential risks related to suppliers, considering aspects such as financial security, geopolitical threats, and supply chain weaknesses. Implement ways to reduce these risks.
3. Audits and site visits to suppliers: Conduct regular inspections and site visits to check supplier facilities, and production processes, as well as quality measures of control personally, assuring alignment with the company's standards and objectives. When visiting suppliers, it is a good habit to make a checklist of what exactly is intended to find out.
4. Cost and value analysis: Determine the most cost-effective supplier by analyzing the total cost of ownership (TCO), which includes elements such as transportation expenses, inventory management, and potential value-added services.
5. Relationship and communication evaluation: Evaluate the supplier relationship's strength by measuring communication efficacy, collaboration, and the supplier's readiness to participate in joint improvement efforts or innovation.

These approaches aim to offer a comprehensive evaluation of suppliers, taking into elements other than cost and product quality. Nevertheless, Van Weele's approaches seem straightforward, although, in reality several methods of evaluation must be used at the same time in the selection of a supplier.

Raute recognizes the need to use various approaches to supplier evaluation, as described by Van Weele's methods. While cost and product quality remain important factors, it also

promotes supplier reliability, sustainability practices, and innovation skills. Combining different methods of evaluation simultaneously, guarantees a comprehensive evaluation of potential suppliers, allowing the company to form strong and mutually beneficial partnerships that correspond with the case company's values and strategic objectives.

#### 4.4 Stages of supplier selection process

The sustainable supplier selection process evolves in several critical stages to ensure Raute's potential suppliers' alignment with environmental, social, and economic sustainability criteria. It starts with a detailed evaluation, which defines accurate sustainability criteria that are indicative of Raute's values and objectives. Following that, suitable suppliers are identified, and a screening and pre-qualification stage follows, with a preliminary review based on sustainability criteria completed.

Following a comprehensive evaluation of the considered suppliers, considerations such as environmental effects, ethical standards, and overall sustainability performance are considered. Establishing performance metrics and key performance indicators (KPIs) is an important step in measuring ongoing sustainability performance. Informed decision-making combines both qualitative and quantitative sustainability aspects.

Agreement and collaboration are the next stages when clear agreements are created detailing sustainability objectives and collaboration is developed with selected suppliers to meet common objectives for sustainability. Raute's supplier selection process goes beyond just selecting and evaluating. Following the initial phases, Raute emphasizes continuous monitoring and improvement to achieve long-term alignment with sustainability objectives. This commitment is demonstrated by continuous evaluation and observations. The company's proactive approach to sustainability promotes a culture of responsibility and accountability throughout its supply chain.

#### 4.5 Defining supplier evaluation criteria

The literature part presents a wide range of different evaluation criteria and criteria for supplier evaluation. Mostly companies use the standard criteria model for supplier evaluation, but it is a convenient method when looking for a short-term supplier. When looking for a partnership, the focus should be on future performance and innovation potential, as well as continuous development. According to Van Weele (Weele, A. J. van. 1997) supplier evaluation can be divided into different levels. The levels are:

- A product level that focuses on the inspection of a supplier's products.
- Process level refers to examining the supplier's manufacturing process. The basic idea is that if the manufacturing process is in order, the product will also meet the requirements.
- Quality assurance system level, which assesses the quality assurance systems of suppliers. It intends to look deeper into the supplier's proactive quality assurance mindset.
- At the company level, the entire company is analysed. The goal of advancing at this stage is to determine the company's future competitiveness.

The importance of suppliers' capacity to create quality is emphasized, particularly when sourcing from abroad. Standardized quality systems have been designed to ensure a specific degree of quality for the product and its manufacturing process. A third-party assessment is also more reliable than data supplied by a public company. However, a quality system may be an expensive and challenging investment for a supplier which may be costly to the company. It could therefore be appropriate to evaluate whether existing quality systems can give a model that helps the case company's company in the evaluation process. Industrial middlemen are also another source of information. According to a Gartner survey conducted in 2022 (Ruane, 2022), 51% of survey respondent companies source from different locations, both domestic and international. When it comes to suppliers' ability to assure quality, the increasing interest in sourcing from different regions has both positive and adverse effects. This is undoubtedly influenced by different nations' reputations as quality producers, calling into question the country-specific reputation as a criterion for evaluation (Oke et al., 2009).

#### 4.5.1 Cost

Price formation in supplier markets has traditionally been thought to be the outcome of a combination of several factors (Mwikali, R. & Kavale, Dr. 2012).

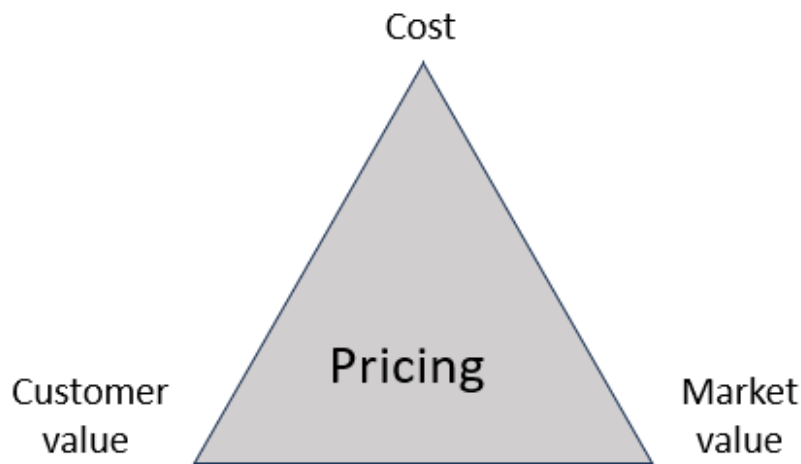


Figure 11: Price effecting factors (Adopted and modified from Persson, 2023).

Previously in this study, we addressed the value of the component to the customer and the impact of market dynamics on the supplier-customer relationship. As indicated in Figure 11, pricing can be influenced by these factors. Let us now examine the pricing factor of the cost of production.

Pricing methods based on the cost of production are widely used. This is the case with margin pricing, in which the supplier prices the item they sell a marginal percentage greater than its own cost price. I noticed that the supplier's profit rate is fixed. On the other hand, target pricing uses the return on capital as a pricing margin by setting a target price for it.

The existence of fixed costs complicates cost-based pricing. It can be difficult to effectively divide them throughout products because their proportion changes from one finished product to the next. The cause for this could be due to differences in manufacturing processes or production volumes, for example. Industries with high fixed costs are always seeking to get sales even at a low price to cover at least some of the fixed expenses. However, in a field with large variable costs is usually not worth engaging in loss-making operations at all (Persson, 2023).

Raute uses both cost-based and competition-based pricing strategies to establish a price-competitive market environment. Meanwhile, market-based pricing strategies are used to

gain a large market share at the most competitive price point possible. This strategy allows Raute to develop a strong market presence and then change prices to reflect operational costs and market realities. Cutting prices has the opposite effect. It prices the product first high and then relatively cheap, which can be the initial target price (Gerpott and Berends 2022).

#### 4.5.2 Pricing and total cost

The iceberg graph that appears in Figure 12 demonstrates the variety of procurement costs. The visible part of the iceberg reflects only the product price. However, modifying this pricing affects only some of the total cost, and even if the iceberg could be broken in terms of price, new costs will immediately emerge from underwater to replace the previous ones. These costs include costs of the acquisition and together with the price form the total cost of ownership which is also referred to as the total cost of the acquisition (Hines, T. 2002).

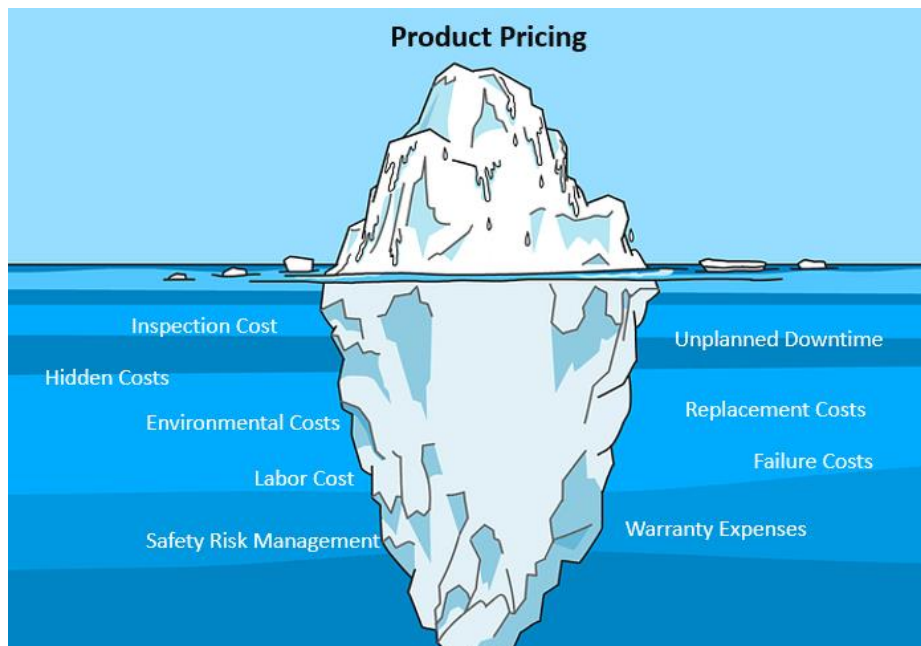


Figure 12. An Iceberg Theory of Cost. (Adopted and modified from Hines, T. 2002).

The two main categories of total cost of procurement are acquisition costs and product maintenance costs (Alzaman et al., 2018).

1. Direct costs, such as price and specification costs, as well as costs spent during supplier evaluation, the agreement, negotiations, and eventually supplier selection. The costs of transportation, product reception, and inspection are also included.

Indirect costs, such as storage, potential costs of failures inside or outside the case company's facilities, and other handling and transportation expenses. It also includes the costs of maintaining the supplier relationship and an agreement for consistent supply. These include, for example, supplier visits and inspections, as well as additional costs associated with maintaining the supplier's performance.

#### 4.5.3 Quality

Quality is the most crucial aspect in the supplier selection process, playing as a foundation that has a direct impact on a company's entire success and reputation. As companies discuss the complicated circumstances surrounding supplier selection, a strong commitment to quality becomes more than just criteria; it is a basic strategic requirement (Sun, F. et al. 2023).

Quality in the supplier selection process is more than just complying with standards; it includes a variety of factors that correspond with the company's goals, values, and end-user expectations. This comprehensive approach can be divided into three main dimensions: product quality, operational quality, and service quality.

- Product quality

Supplier selection demands a comprehensive review that not only meets but exceeds industry requirements. This aspect highlights the supply of products that not only meet practical demands but also stand out in terms of resilience, efficiency, and overall competitive outstanding performance. Companies that engage in sustainable supplier selection attract suppliers who share the same commitment to excellent product quality, recognizing its critical role in reducing waste, optimizing the utilization of resources, and promoting long-term collaboration (Negash, Y. T. et al. 2020).

- Operational quality

The supplier selection process considers the supplier's operational efficiency and performance, simplified processes, commitment to industry standards, and a commitment to ongoing improvement demonstrate a supplier's dedication to operational excellence. This includes an evaluation of not only the suppliers' ability to provide high-quality products or services but also their dedication to sustainable operations. Companies that are dedicated to sustainability evaluate their suppliers for efficient and sustainable operations, evaluating criteria such as resource utilization, waste management, and compliance with ethical labour standards. (Vahidi, F. et al. 2018). It guarantees that the supplier's internal processes are consistent with the requirements and standards set by the case company.

- Service quality

In today's corporate landscape, service quality is a crucial factor in the supplier selection process. Suppliers make a big contribution to the total customer experience because a dedication to competence, effective communication, and creative problem-solving turns the relationship into a strategic collaboration. The quality of service guarantees that buyers not only acquire items, but also have a positive, supportive, and pleasant experience throughout the process of purchasing (Yu, Y. & Huo, B. 2019).

#### 4.5.4 Supply time

Delivery is an essential factor when selecting a supplier. It includes security of supply, delivery time, reliability, and security of delivery. Security of supply is the ability of a supplier to deliver the right quality product in the right quantity to the right place at the right time, in accordance with a defined mode of transport and price (Noori-Daryan, M. et al. 2019). Security of supply refers to suppliers complying with established timelines for delivery and quantities. Supply security is critical, especially for industries like manufacturing. Delayed and inaccurate delivery causes manufacturing to stop altogether, leading to increased costs, loss of revenue, and ultimately customer dissatisfaction (Sverdrup, H. U. et al. 2017).

Furthermore, early delivery can result in increased storage costs for the purchasing company. (Noori-Daryan, M. et al. 2019) the article highlights the importance of on-time delivery (OTD). It indicates the period in which the supplier can deliver the ordered product. Delivery

time differs according to the industry and nature of the products purchased, resulting in different delivery time requirements. Short delivery times offer operational flexibility, allowing the company to respond to changing customer needs and address potential challenges quickly. This makes the purchasing company more competitive. However, longer delivery time is preferable to a poor supply certainty since a poor security of supply creates more problems for the operation of the company.

#### 4.5.5 Financial position

When selecting suppliers, the supplier's financial position and stability are significant factors to consider. It consists of the financial system's stability, reliability, and growth rate. It is an important part of importance to evaluate the financial stability when evaluating a supplier's financial position. Establishing long-term supplier partnerships requires ensuring the supplier's financial stability. This ensures that the supplier can grow its operations, invest in processes for manufacturing, and maintain cooperation. When evaluating strategic suppliers, it's important to consider their growth rate. Monitoring sales growth and market share provides information on a supplier's potential growth rate, which is critical for projecting future growth or decline (Taherdoost & Brard, 2019).

#### 4.5.6 Production capacity and technical performance

The supplier's production capabilities, capacity, technical performance, and technological proficiency are also considered when selecting suppliers. These indicate the supplier's ability to manufacture products of sufficient quantity and quality to meet the case company's requirements (Che & Wang, 2008). If the purchased products demand innovative solutions and advanced development, the purchasing company should evaluate the supplier's capacity to design innovative products. The article (Che & Wang, 2008) also highlights the importance of the supplier's technological skills in their own company. Even if a supplier does not have the lowest purchase price, they can contribute their own experience to the purchasing company and improve the company's performance.

#### 4.5.7 Environment and ethical

In today's supplier selection landscape, environmental and ethical aspects are now recognized as defining criteria for responsible and sustainable business practices. Companies understand the major influence their supply chains can have on the environment and society, which requires a comprehensive evaluation of these aspects in the selection process. Environmental issues go beyond basic compliance and include a supplier's dedication to sustainably sourced approaches and resource optimization. Companies prioritize suppliers who share their commitment to reducing environmental footprints, encouraging circular economies, and embracing green technologies. Environment and ethical have become crucial criterion for selecting suppliers as they have become vital aspect of the companies' operations and reputation (Guarnieri, P. & Trojan, F. 2019). However, ethics has emerged as a significant supplier selection criterion in the supplier market. With today's global markets experiencing ethical issues such as insufficient wages, illegal long working days, and workplace safety, ethical conduct is becoming an important criterion for companies when selecting a supplier.

#### 4.5.8 Supply planning

During the delivery planning phase, the components being purchased are carefully examined. It is critical to evaluate the true significance of the component, the surface, and its impact on the customer base, such as supply disruption. Furthermore, the evaluation includes determining how much revenue is dependent on the specific component. In addition, the delivery planning phase resembles to the company's own internal evaluation phase (Asefa, T. et al. 2014).

Sustainable supply planning has become a key component in the supplier selection process, changing traditional procurement strategies in accordance with environmental, social, and economic sustainability goals. This strategic approach recognizes the complex relationship of these elements and emphasizes the need of responsible sourcing for developing resilient and ethical supply networks. The process includes a comprehensive evaluation of supply chain activities, considering the full product lifespan, from raw material extraction to end

use (Asefa, T. et al. 2014). The goal is to build resilient and responsible supply chains that promote social well-being and economic sustainability.

The integration of ecological considerations into the supplier selection process is driven not just by ethical concerns, but also by the awareness of the business benefits associated with responsible sourcing. Buyers and stakeholders are becoming more interested in businesses' sustainability efforts, which influence purchase decisions and brand loyalty. Adopting sustainable supply planning in the supplier selection process can improve a company's reputation, reduce risks, and generate a competitive advantage in the market.

(Patil et al., 2022) present a complete framework for sustainable suppliers, highlighting the importance of a comprehensive approach that considers environmental, social, and economic issues. The framework enables companies looking to integrate sustainability into their supplier selection processes with practical guidance.

(Zhan et al., 2021) examine how sustainability affects supplier selection and company performance. Their study found a link between sustainable supplier practices and overall business ethics, suggesting the potential for sustainable supply planning to be beneficial to the overall achievement of the organization.

In supplier selection, the sustainable supply planning framework entails proactive engagement with suppliers to ensure alignment with the objectives of sustainability. This consists of transparent communication, setting objectives collaboration, and the development of common high standards for environmental and social performance. Companies are additionally using technology, such as blockchain and data analysis, to improve traceability of their supply chains and transparency. Ongoing monitoring and evaluation of the performance of suppliers under sustainability criteria is a crucial aspect of the sustainable supply planning approach. Regular inspections and evaluations ensure that suppliers comply to established sustainability standards as well as offering opportunities for improvement (Zhan et al., 2021).

#### 4.6 Identifying requirements

In the effort to achieve sustainable business practices, the first phase of sustainable supplier selection is a comprehensive identification of requirements. This approach goes beyond

typical procurement criteria, considering environmental, social, and ethical factors. Companies establish specific standards for sustainability, such as sustainable manufacturing processes, equal pay for workers, and a dedication to social responsibility. As companies increasingly observe the value of integrating sustainability into their operations, establishing, and expressing these needs becomes a critical approach for establishing responsible and ethical relationships with suppliers (Chang, J.-P. et al. 2023). However, the evaluation covers both the wider market environment and the specifics of individual suppliers. It entails an extensive analysis of market structures, operational patterns, and elements such as market location, production processes, and cost and price levels.

The value of Raute's expertise and dedication in making strategic supplier selections has been emphasized in many kinds of situations. Individuals have been discussed with so far, and their opinions have been considered in their work. However, interaction between the different departments of the company, as well as knowledge sharing about the needs is equally crucial.

In addition to a discussion with Raute's sourcing and operational purchasing manager, Kai Huuhtanen, important details were gathered through the participation of important participants, including Hanna Vilppula, a current research and development trainee and former purchaser, and Satu Kaivonen, an ESG manager, who responded to comprehensive questions. The primary objective of this collaborative engagement was to define an effective purchase strategy that addressed environmental issues during the procurement process. Simultaneously, the focus shifted to developing an effective evaluation process for suppliers competing for inclusion in the purchasing process.

Simultaneously, the questionnaire distributed to ESG manager Satu Kaivonen aimed for a comprehensive understanding of the anticipated influence of the new ESG guideline on the supplier selection process. This strategy approach aims to align Raute with evolving sustainability requirements while also proactively incorporating environmental, social, and governance (ESG) factors into the manufacturing process of the supplier selection framework. The joint efforts of these key players demonstrate Raute's commitment to incorporating sustainability and ESG concepts into its procurement strategy, assuring a responsible, resilient, and forward-thinking approach to supplier selection.

#### 4.6.1 Certifications

Sustainable supplier certifications are important in today's supplier selection process because they provide companies with an effective framework for evaluating and selecting suppliers that are committed to social and environmental responsibility. These certifications are important indicators of a supplier's commitment to sustainable practices, and they correspond with a company's overall commitment to responsible and ethical sourcing. Sustainable supplier certifications are important in today's supplier selection process because they provide companies with an effective framework for evaluating and selecting suppliers that are committed to social and environmental responsibility (Castro e Silva et al., 2022). These certifications are important indicators of a supplier's commitment to sustainable practices, and they correspond with a company's overall commitment to responsible and ethical sourcing.

Companies are increasingly empathizing suppliers who demonstrate a commitment to sustainability when selecting suppliers. Criteria go beyond price and quality to include commitment to the environment, social responsibility, and ethical corporate operations. Certifications such as ISO 14001 for environmental management and Fair-Trade certifications for ethical labour practices have become important indications in evaluating potential suppliers. The ISO 14001 standard for environmental management systems is a well-known certification in this field. Suppliers who follow ISO 14001 display a systematic approach to controlling the influence on the environment, demonstrating their dedication to reducing their carbon footprint. This globally recognized certification helps companies in finding suppliers with effective environmental management practices (Castro e Silva et al., 2022).

Satu Kaivonen emphasizes the importance of ISO 14001 to Raute's overall strategy. This international standard for environmental management guides and shapes Raute's commitment to sustainable practices. ISO 14001 is the foundation of the company's strategy structure, ensuring that sustainability issues are integrated into all aspects of operations. This dedication demonstrates Raute's commitment to maintaining high environmental standards, promoting sustainability, and aligning its business operations with international best practices in environmental management.

These certifications not only certify a supplier's commitment to sustainability but also help companies reduce risk. Companies that work with certified suppliers minimize the likelihood of environmental, social, or ethical challenges in their supply chains, improving overall supply chain resilience. Companies use these certifications to develop criteria for evaluating potential suppliers throughout the supplier selection process. Certifications act as performance benchmarks for sustainability, helping in the discovery of suppliers who share a company's values and sustainability objectives.

Regardless of its benefits, companies should carefully evaluate the relevance and comprehensiveness of certifications within their own industry and environment. It is also important for companies to adjust their criteria to guarantee a complete evaluation because not all certificates are equally useful. One of the tools Raute uses to determine its domestic suppliers is the Vastuu Group.

Vastuu Group Oy, formerly known as Suomen Tilajavastuu, concentrates in providing services to companies in all industries that are focused on meeting social and legislative obligations as a manufacturer. The most well-known service is the Reliable Partner service, which demonstrates that the company's legal obligations, tax, and employee payments are in order. Vastuu Group provides services to businesses, subscribers, and individuals. The Reliable Partner is one of the services aimed at companies. It automatically collects information necessary by the Company's Subscriber Liability Act (22.12.2006/1233) From the reliable partner, Raute can immediately determine whether the supplier has met its legal obligations (Vastuu Group, 2024). The Subscriber Liability Act is intended to counteract the black market by promoting equal competition among businesses and compliance with operational standards. The report may also include information about the company's credit rating, certification, and other relevant details.

#### 4.6.2 Selection process stages in the case company

There is a clear planned process in place for the case company's supplier selection, and this process is being followed. Based on the discussion with Raute's sourcing and operative purchasing manager, the selection of suppliers follows the same formula for all suppliers and there is a strict process that goes through all the different stages of the new supplier. Only a relatively small number of suppliers of one-time transactions are exempted.

The selection process begins with the development of a new need. Product development projects typically generate the requirement, following which the features that are needed and the business goals of the product to be purchased are specified. Because Raute's products range so wide, the features needed for the items and the criteria required from the supplier also differ significantly. As a result, each product demand is considered separately, and the company doesn't utilize the general requirement criteria. The criteria are created in cooperation with the product development department of the company as well as the overall business strategy.

When looking for a new supplier, it is usually important to review the current supplier stock to see if there is a suitable supplier before looking for new ones and doing the evaluation process. Based on what has been discovered, the case study Raute intends to limit the number of suppliers and focus procurement on specific suppliers. The goal is to build stronger and longer-term collaboration relations with current suppliers, which is why new suppliers are rarely acquired. New suppliers will be acquired only if they can deliver new technology or other expertise. If a suitable supplier cannot be discovered in the current supplier stock, a new supplier must be found. When looking for new suppliers, the goal is to acquire long-term, diverse, and developing suppliers.

When purchasing from a new supplier, the company frequently knows which suppliers to approach directly. Procurement managers and the company are continually analysing the supplier market as well as the formation of requirements. The formation is part of identifying potential suppliers, mapping confidentiality agreements, signing basic data, collecting financial data concerns about sustainability, the environment, and accountability analysis, submitting an evaluation, and selecting offer product development team members, which is why potential suppliers are typically prepared. Raute receives requests from potential suppliers electronically, they are requested for recommendations from their own suppliers, and Google is used as an information search engine. Once possible suppliers have been identified, certain candidates will be contacted and asked if they are interested in working with the company.

The supplier is then required to sign a confidentiality agreement. Participants emphasize that because the company's products are technologically advanced, it is critical to ensure data confidentiality before engaging in business interactions. The next stage is to learn about the supplier's background and financial status.

Basic financial information is collected about the supplier from general databases. Among the criteria to be evaluated are reliability, capability to pay, turnover, number of staff members, and debt level. Following this, the general suitability and interest of the supplier in the company will be evaluated. The goal of is to investigate the suppliers' sustainability, environmental, and ethical policies, among other things. In this case, the company wants to verify that the supplier company shares its values. Based on this information, the supplier's foundation is evaluated, and it is verified that: the supplier meets the needs of the company. Following that, tender proposals are given to potential suppliers, who are then evaluated.

Finally, Raute selects the most suitable supplier based on the evaluation of the supplier selection process. To help in this decision-making process, the company uses a scoring system to objectively compare and evaluate potential suppliers. The scoring chart, for example, might include characteristics such as quality, reliability, pricing, sustainability practices, and expertise in innovation. Each criterion has a score, and suppliers are evaluated depending on how well they operate against these criteria. Raute's use of a scoring chart ensures a structured and transparent selection process, allowing the company to select the supplier that most closely matches its strategic objectives and values.

#### 4.6.3 ESG

The EU sustainability reporting directive (CSRD, Corporate Sustainability Reporting Directive) came into operation on January 5, 2023. This new directive modernizes and strengthens the standards governing the social and environmental information that businesses are expected to report. In the future, a growing number of large companies and publicly traded SMEs are required to report on their social responsibility efforts. ESG (Environmental, Social, and Governance) reporting is for most businesses that do not record their social responsibility operations and those that do report it do so mainly with minimal public transparency (Burkinshaw, 2024).

The EU's purpose is to standardize all ESG reporting and offer a single framework for information inclusiveness. In the financing process, ESG data is regarded as information that must be approved by the company's board of directors. According to the new CSRD directive, both financial and ESG managers approve the financial statements and evaluate and approve the ESG content, as it is part of the board's report. According to the new ESG

directive, every company with more than 250 employees, a turnover of more than EUR 40 million, or net assets of more than EUR 20 million must submit an ESG report starting from January 1, 2024 (Burkinshaw, 2024). As a result, Raute recruited a new ESG Manager last year (2023) to push forward a more sustainable future for products made from engineered wood by implementing Raute's new ESG strategy and building a sustainability strategy.

Raute is a major international company. Nonetheless, the majority of Raute's suppliers are relatively significant and authorized to submit ESG reports. The ESG report can also be used to identify potential suppliers while conducting the supplier selection process. Furthermore, for small supplier companies that are not required to publish an ESG report, there may be compelling reasons to do so. More and more companies have high aims and will not collaborate with suppliers that do not align with their environmental strategy. Compliance with climate criteria should be monitored not just in terms of direct CO<sub>2</sub> emissions, but also of emissions created across the supply chain and product life cycle. This means that suppliers that rely on fossil fuels face a severe threat to environmental objectives.

Environmental, Social, and Governance (ESG) concerns have become an important part of the supplier selection process, reflecting a growing understanding of the importance of sustainability and ethical standards in corporate efforts. Companies are increasingly including sustainability factors in their evaluation and prioritization of potential suppliers, understanding the larger influence of their supply chains on the environment, society, and governance business practices.

Satu Kaivonen pointed out the importance of an integrated strategy in Raute's supplier evaluation process, especially for environmental, social, and governance (ESG) aspects. The company's commitment goes beyond just reducing CO<sub>2</sub> emissions and pursuing a net-zero emissions path. The evaluation criteria cover a wide range, including but not limited to chemical safety, human rights, financial data indicators, and the performance of supplier supply chain management. A crucial aspect highlighted by Kaivonen is the recognition that these key performance indicators (KPIs) for ESG assessments must be modified to the features in each supplier category. The ESG criteria applicable to steel suppliers differ significantly from those relevant to other suppliers. This acknowledgment emphasizes the need for a category-specific approach, which ensures that the evaluation process is relevant

and effective for each supplier category. By implementing such a specific strategy, Raute positions itself at the top of sustainable and ethical supplier management practices.

Companies evaluate suppliers based on their dedication to environmentally friendly processes, resource efficiency, and compliance with environmental regulations. Fair work practices, diversity, and community involvement are examples of social aspects. Ethical business conduct, transparency, and compliance with regulatory norms are examples of governance criteria.

Companies that prioritize ESG performance in their suppliers have a positive social impact, improve their reputation, and reduce long-term risks linked with environmental and social challenges. Balancing ESG factors with traditional procurement criteria is difficult, but companies see it as a strategic desire. This approach not only aligns with ethical business practices but also allows companies to thrive in a business environment that is becoming increasingly ESG-conscious.

#### 4.7 Risk analysing

A new supplier relationship usually carries risks. They have already been evaluated multiple times in this study from different perspectives. However, at the end of all evaluations, it is still useful to summarize the risks identified along the process and evaluate how significant they are. At the same time, it is possible to discover if a risk was overlooked in previous evaluations. As with market failures, evaluation inquiries can be used to detect additional risk indicators to address other risk factors.

Questions to consider include:

- Will the supplier sustain market pricing dominance in the future?
- Does the supplier offer sufficient long-term technical support?
- Is the supplier's management committed to the desired business arrangement?
- Is there proper information exchange between the company and the supplier?
- Do both parties align and collaborate effectively on future plans?

- To what extent does the supplier comprehend the buyer's industry and invest in problem-solving efforts?

It is essential to analyse risk management from the standpoint of product development collaboration, emphasizing the risk to the supplier's ability to adjust to rapid changes in demand. Raute's tendency to become focused on the technological advancements of one supplier can be seen as a risk. This emphasizes the importance of the supplier selection process in reducing the risk of being dependent on a single supplier. On the other hand, it is essential to emphasize the importance of the case company in monitoring the market and introducing new technologies to the supplier to avoid being stuck by outdated technology (Salavati et al., 2016).

Supplier risk analysis is an important part of efficient supply chain management because its analysis potential disruptions and vulnerabilities associated with the company's suppliers. Various indicators can be utilized to assess risk and inform decision-making in the supplier selection process. Financial stability, geopolitical circumstances, compliance with rules and regulations, and operational reliability are all important indications of supplier risk. Financial stability measurements evaluate a supplier's financial health and ability to withstand economic crises. Geopolitical factors consider the location of suppliers in locations subject to instability, industrial disruptions, or territorial disputes (Lockamy, A. & McCormack, K. 2010).

#### 4.8 Negotiation and agreement

The case company's negotiation outcomes are frequently evaluated using the "win-lose" approach. This indicates that one of the negotiation parties wins and the other loses. As a result, the outcome of the negotiations has no value, only the balance between the parties has been changed. A more effective approach is a "win-win model," in which both parties to the negotiation see the outcome as beneficial to both (Yu, 2015).

The purpose of collaboration-based negotiation between the case company and supplier is to remove conflict, promote a genuine spirit of partnership, and ensure that both sides are truly satisfied with the outcome of the negotiations, not only from their own perspective.

There are three main phases to the negotiation process (Parvaneh & Akbari, 2022).

- Preparation phase of the negotiation: This phase includes gathering information, objective formulation, strategy planning, negotiation role distribution, and so on.
- Meeting phase: This is the stage in which parties sit together at the negotiating table. This phase can also be further divided into three stages: the introduction phase, the discussion phase, and the agreement phase.
- The last stage of the negotiation: The successful implementation of the negotiations' agreement requires careful verification that the parties understand the agreement in the same way. This is followed by handling the proposal for the agreement and, finally, preparing the agreement so that collaboration can start.

Negotiators need to have clear objectives for the negotiations, as well as be aware of the obligation and evaluate whether it is appropriate for the negotiating situation. A crucial aspect of contract formation involves effectively communicating the solution to both approved and non-approved suppliers. Motivating approved suppliers is essential for fostering optimal cooperation. Meanwhile, informing non-approved suppliers should be conducted in a manner that maintains their potential as future collaborators while avoiding specific reasons for rejection, if requested, providing guidance on potential improvements in future bids can be acceptable. These efforts aim to elevate the overall standards of suppliers. However, caution must be exercised to prevent the disclosure of confidential information (Parvaneh & Akbari, 2022).

#### 4.8.1 Agreement strategies

A supplier selection agreement strategy is an important part of a company's procurement process because it defines the basic principles and requirements that influence supplier selection. This approach provides a road map for decision-making, emphasizing crucial factors such as the quality of the product, efficiency, reliability, and environmental and ethical issues (Octavio Hernández Castorena et al. (2015).

During the agreement strategy development phase, the company identifies the nature of the long-term supplier relationship, analyses the pricing background of the suppliers, and looks

at associated risks. This step also includes a critical decision on whether to manufacture the component internally or purchase it elsewhere. This phase results in a complete strategy for supplier engagement, which serves as a basis for afterward supplier evaluations. Furthermore, an effective agreement strategy enables the formation of long-term collaborations. Companies can establish relationships with suppliers that extend beyond business engagements by clearly defining objectives and encouraging transparency for long-term and mutually profitable collaborations.

#### 4.8.2 Acquiring the right contract

The procurement manager has the responsibility of having a complete understanding of the availability of suppliers. It is critical to understand the locations of suppliers as well as the classification of products they develop. This understanding is the basis for effective procurement strategies. Understanding the demographic information of suppliers and their various manufacturing capacities is critical. The procurement manager arranges efficient sourcing strategies, ensuring timely and high-quality acquisitions, by having a solid comprehension of supplier landscapes and the range of products available. This comprehensive knowledge enables the procurement expert to effectively navigate the supplier market, develop strong partnerships, and obtain the resources required quickly and effectively to meet company requirements (Yang, S. et al. 2021). There is a general perception that there are plenty of suppliers available, but in reality, the situation may be different.

#### 4.8.3 Limitation of potential suppliers

The process of selecting suppliers starts with an understanding of product requirements, which is frequently the result of product development projects. Following that, the important features and business goals for the proposed purchase are defined. The requirements for products are the criteria anticipated by suppliers.

Raute uses a tactical approach to link its supply chains with ethical and environmental considerations by limiting the stock of potential suppliers based on their sustainability performance. This approach tries to guarantee that suppliers follow sustainability

requirements, which contributes to the company's overall commitment to responsible sourcing.

Raute frequently develops demanding standards for sustainability, social responsibility, and ethical business practices throughout the supplier selection process. Suppliers who have internationally recognized sustainability certifications, such as ISO 14001 for environmental management and Vastuu Group (Reliable certificate) for ethical labour practices, are given an advantage. These certificates serve as benchmarks, indicating a supplier's commitment to sustainable operations.

Limiting potential suppliers based on sustainability may restrict the number of opportunities, affecting issues such as cost and geographical diversity. To establish a sustainable and efficient supply chain, companies must carefully balance sustainability goals with operational factors. The limiting of potential suppliers based on sustainability performance is a constant topic in which companies are continually improving their criteria to react to changing sustainability requirements and market realities. Finding the right balance enables Raute to contribute to global sustainability goals while maintaining a resilient and competitive supply chain.

#### 4.8.4 Decision making mechanism

Traditionally, cost, categorization, and proportional evaluating methods as well as statistical methods have been used to support decision-making. In the cost ratio method, the supplier's performance is valued using cost accounting methods. For example, quality, deliveries, and services are given a value, which is then proportioned to the purchase price. This makes it possible to compare different suppliers. In the categorization method, supplier performance is classified using specific key performance indicators (KPIs). The advantage of the system is the clearly advancing structure of the model. On the other hand, the model ignores the different significance of different factors and decisions leading to subjective decision-making outcomes (Chai & Ngai, 2020).

Within the linear model, supplier selection entails a structured approach that allocates values according to established criteria for evaluating and selecting suppliers. Initially, criteria are specified, such as cost, quality, delivery performance, and reliability. Each criterion has a

numerical weight allocated to it based on its value to the company. Suppliers are then evaluated on these criteria, and their performance is measured, usually by scoring or ranking methods. The weighted ratings or rankings help in objectively comparing suppliers and making developed selections that are aligned with the strategic objectives of the company (Ghodsypour & O'Brien, 1998).

In addition to the previously described decision-making support systems, Raute additionally developed a decision-making framework for supplier selection. Within this framework, the basic criteria for supplier evaluation are defined and divided into two distinct groups. The second set of criteria specifies mandatory requirements that a potential supplier must meet to be evaluated using the essential criteria. As a result, these basic requirements are naturally restrictive. Meanwhile, the other set of criteria, known as demand criteria, goes through an evaluation and value process like the one used by the linear model. These criteria work as evaluating considerations in identifying potential suppliers. Finally, the sensitivity of the outcome can be assessed by varying the relative importance of the desire and fundamental requirements.

The consideration of sustainability in supplier selection has become critical in modern supply chain management. An effective decision-making structure ensures the identification and engagement of suppliers who comply with environmental, social, and economic sustainability standards. It is essential to have clear decision-making criteria. Environmental certifications, labour practices, carbon footprint, compliance with sustainability standards, and commitment to circular economy concepts should be all part of the evaluation (Alikhani, R. et al. 2019).

The evaluation process is facilitated by a variety of decision-making tools and models. The Analytic Hierarchy Process (AHP) is a structured approach for prioritizing sustainability criteria and weighting supplier selection aspects, assuring an accurate and systematic decision-making process. Companies can use the Analytic Hierarchy Process (AHP) to identify sustainable suppliers. AHP refers to a decision-making approach with many criteria that allows companies to rank and evaluate suppliers based on a range of defining features. It involves utilizing a structured approach to rank and balance multiple sustainability criteria, that helps in the systematic evaluation and selection of suppliers who meet social, economic, and environmental standards. (Pishchulov et al., 2019).

Navigating the obstacles of sustainable supplier selection requires strategic solutions, ongoing monitoring, supplier collaboration, and performance enhancement initiatives to handle issues related to sustainability while maintaining compliance.

#### 4.8.5 Selection stage

Raute's supplier selection process involves developing criteria based on an agreement strategy, which is then used to analyse and evaluate potential suppliers. This complete evaluation includes an extensive evaluation of both suppliers and their offers, considering a variety of factors such as sustainability, quality, dependability, responsiveness, and cost-effectiveness. Suppliers are extensively analysed on the company's criteria, and their performance is carefully evaluated to establish their suitability for collaboration with Raute. This deliberate approach helps Raute discover and rank potential suppliers who are closely aligned with the company's strategic objectives and operational requirements, allowing for more informed decision-making and the development of mutually beneficial supplier partnerships.

#### 4.8.6 Conclusion of the agreement

The agreement signing phase is a significant step in the supplier selection process because it formalizes the commitment with selected suppliers by creating legally binding agreements. This phase not only strengthens alliances, but also establishes specific expectations, rights, and obligations for both parties, assuring alignment and transparency in the business relationship. Furthermore, an important component of this step is to provide accurate and constructive feedback to suppliers who were not selected, as well as develop respect and maintain positive connections within the supplier network. Companies that properly manage this phase can improve trust, communication, and collaboration with both selected and non-selected suppliers, which contributes to their supply chain's overall success and resilience.

#### 4.9 Raute's environmental achievements

Raute is dedicated to actively working for the long-term development of the wood products industry. This is based on the challenges that manufacturers, suppliers, and other stakeholders in the industry encounter. Raute presented its annual responsibility strategy at the beginning of 2023, which gives a roadmap for its activities in all markets, responding to environmental and social concerns.

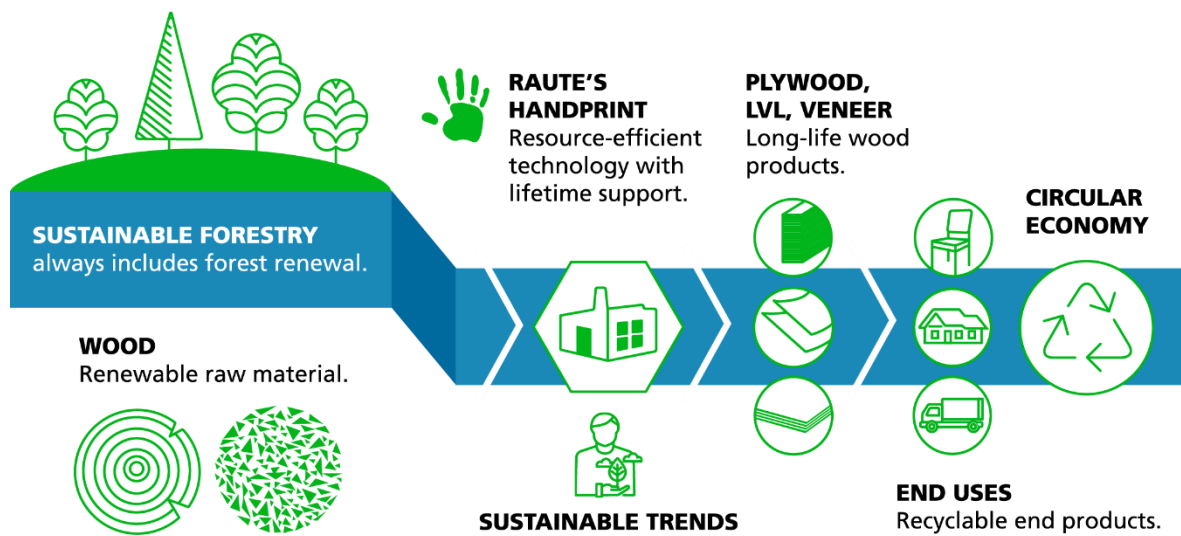


Figure 13: Raute's environmental framework (Raute Oyj, 2024).

Raute's environmental strategy demonstrates the company's dedication to sustainable and environmentally friendly practices in all aspects of its operations. In keeping with this commitment, Raute regularly pursues initiatives that benefit the environment.

A key component of Raute's environmental approach is the concept of a "Handprint," which represents the company's commitment to making a positive effect. This goes beyond basic sustainability and actively improves environmental circumstances, in line with global efforts to prevent climate change.

Raute integrates sustainable techniques throughout its plywood and veneer production processes. This involves responsibly obtaining raw materials, optimizing industrial processes to reduce waste, and implementing energy-efficient technologies. The company promotes the circular economy concepts, aiming to reduce environmental effects by reusing resources, recycling waste, and developing products with end-of-life features. This circular approach ensures that Raute's products have a more sustainable life cycle.



Figure 14: Raute's strategy (Raute Oyj, 2024).

Raute's future strategy is clearly connected with a comprehensive vision that includes environmental sustainability, cutting-edge technology, and a people-focused approach. The company is devoted to promoting environmentally friendly processes, lowering carbon footprints, and implementing sustainable sourcing throughout its activities. Nevertheless, the company is committed to constantly improving its technological solutions, ensuring they are in line with industry trends and contributing to the overall efficiency and sustainability of wood processing operations worldwide.

#### 4.10 Summary of findings

Gathering information about suppliers often involves investigative efforts to identify potential candidates and effectively evaluate them. The availability of information sources is dependent on understanding how to utilize them effectively.

The process of evaluating suppliers necessitates dividing into smaller groups and further subdivisions into specific criteria. These requirements must be measurable and comparable, allowing for comparisons between suppliers. Several techniques have been developed to help in decision-making during supplier selection. Nevertheless, it is necessary to approach the techniques critically because they could lead to different results.

While the importance of pricing in total procurement cost can often be exaggerated, it remains a crucial aspect. Price, like the "tip of the iceberg," determines only a part of total procurement expenses. Understanding price formation methods and manufacturing cost principles is critical for evaluating overall costs, especially given that organizational development can reduce manufacturing costs.

It is critical to take an advanced approach that differs from pre-planned supplier blueprints. Analysis of cost backgrounds conditioning analysis and being alert against market unfairness on some level such as cartels and monopolies, all contribute to efficient total cost management. Continuous evaluation of supplier-related risks must be performed throughout the supplier selection process.

In the final stages, it is important to critically evaluate outcomes by posing verification questions and investigating criteria. Contract drafting and communicating decisions to both approved and non-approved suppliers is a critical phase in the supplier selection process. The method of communication has a considerable impact on the quality of future collaborations and the perception of suppliers while looking for new ones in the future.

The iceberg graph in Figure 12 illustrates the variety of procurement costs, with the visible part reflecting only the purchasing price. Modifying this pricing affects only some of the total cost, which includes acquisition costs and product maintenance costs. The two main categories of total cost of procurement are acquisition costs and product maintenance costs. Direct costs include price and specification costs, while indirect costs include storage, potential failures, and maintenance of supplier relationships. Quality is a crucial aspect in supplier selection, impacting a company's success and reputation. Quality in supplier selection includes product quality, operational quality, and service quality. Companies that engage in sustainable supplier selection attract suppliers who share the same commitment to excellent product and service quality.

The EU's Corporate Sustainability Reporting Directive (CSRD) has standardized social and environmental information reporting standards for businesses, making ESG reporting crucial in supplier selection. Raute has hired an ESG Manager to implement its sustainability strategy. The company's supplier evaluation process includes ESG aspects, including chemical safety, human rights, financial data, and supply chain management performance. Balancing ESG factors with traditional procurement criteria is challenging, but companies

see it as a strategic desire. Supplier risk analysis is essential for efficient supply chain management, and reducing market failures like cartels and monopolies can help.

Raute selects suppliers based on product requirements and business goals, ensuring they meet sustainability standards. They limit stock based on sustainability performance, promoting responsible sourcing. Suppliers with internationally recognized sustainability certifications, like ISO 14001 and Vastuu Group, are given an advantage. Balancing sustainability goals with operational factors is crucial for a sustainable supply chain. Raute continually updates its criteria to adapt to changing requirements and market realities, ensuring a resilient and competitive supply chain while contributing to global sustainability goals.

Raute is committed to long-term development in the wood products industry, addressing environmental and social concerns. It introduced a new responsibility strategy in 2023, focusing on sustainable practices in all operations. Raute's "Handprint" concept represents its commitment to positive environmental influence. The company integrates sustainable techniques in plywood, and veneer production processes, aiming to reduce waste and promote a circular economy. Raute's future strategy includes environmental sustainability, cutting-edge technology, and a people-focused approach. The company is committed to promoting environmentally friendly processes, lowering carbon footprints, and implementing sustainable sourcing.

#### 4.11 Discussions

Suppliers undergo evaluation and the most qualified suppliers will ultimately be selected for the company. Furthermore, different strategic supplier relationships select suppliers using different criteria. As a result, the thesis focused on the selection process, selection criteria, and supplier classification. The purpose of this is to bring together the research findings collected in the theoretical and applied parts. The applied part was carried out as a qualitative case study in which the case company works in the industry. As a result, the thesis's conclusions cannot be generalized but the findings may only be compared to companies in the same industry.

The theoretical part identified various stages of the supplier selection process, including identifying supplier requirements, identifying key procurement requirements, defining a supply strategy, identifying potential suppliers, limiting suppliers, determining evaluation methods, and final supplier selection and contract negotiation. Based on the discussions with the case company's representatives, the case company's supplier selection process appears to resemble the one in question. The applied part covers the supplier selection process: "How supplier selection is implemented in the case company?" The goal was to present an overview of the supplier selection process as well as to identify the key aspects to consider during the selection process.

Based on the theoretical and applied parts, the initial and most important stage in the selection process is to determine the procurement requirements as well as the business objectives that define the criteria for supplier selection. Because company purchases and business objectives differ significantly, so do the selection criteria, which is why there is no standard approach for selecting a supplier. Selection criteria can be adjusted to each scenario. The theoretical part's most important selection criteria were pricing, cost, quality, timeline and supply security, financial position, production capacity, technical performance, cooperation, partnership, environmental protection, and ethics. Based on the observations and responses received, the case company's selection criteria corresponded to the theoretically defined criteria. Price and cost were not viewed as key concerns, as the theoretical part anticipated.

By combining theoretical evaluation and applied case study research, the thesis effectively addresses the gap between theoretical frameworks and practical implementation. The findings indicate that, while there is no standardized strategy for supplier selection, many essential stages and criteria remain the same across circumstances. Identification of procurement requirements and business objectives emerges as a vital early stage in the selection process, emphasizing the need for a unique strategy that reflects the company's specific goals and priorities (Golobrodka, 2024).

Furthermore, the study highlights a variety of selection criteria, including cost and quality, environmental issues, and ethical standards. Through interactions with case company representatives, the study validates the relevance and applicability of these criteria in the industry setting (Priya, 2020). Additionally, the alignment of theoretically specified

criteria with selection criteria seen in the case company demonstrates the research findings' reliability.

It is important to highlight that the study's conclusions are specific to the case company and cannot be generalized to other companies operating in different industries (Andrade, 2020). Nevertheless, the findings provide useful information for companies in the same industry looking to improve their supplier selection processes. Overall, the study provides a comprehensive review of supplier selection methods, bringing light on critical factors and best practices that can help influence decision-making and enhance procurement outcomes.

This research demonstrates the importance of supplier evaluation and selection processes, emphasizing that the most sustainable and reliable suppliers are chosen using specific criteria evolved to the case company's strategic supplier relationships. Qualitative case study approach to evaluate the selection process, criteria, and supplier classification in the context of the case company's industry, providing important perspectives into practical implementation (Rashid, Y. et. al, 2019). The case study's findings give a balanced viewpoint of supplier selection processes, emphasizing the necessity of corresponding procurement requirements with business objectives to guide selection criteria.

## 5 Conclusions

The thesis case study aimed to evaluate the process of selecting suppliers in the case company. The purpose was to identify the underlying factors of the selection criteria, which means whatever characteristics within the company establish the selection criteria to be utilized. Before delving into the thesis's major research problem, supplier selection must be theoretically evaluated. The selection process and accompanying supplier selection criteria are important factors in supplier selection since they form the foundation for the overall selection of suppliers.

Globalization has increased the availability of potential suppliers, providing new opportunities and challenges in supplier selection process. There are increasingly more alternative suppliers available, but potential risks have increased, which must be considered when selecting suppliers. Furthermore, the theoretical and applied part emphasized the preference for existing suppliers in the selection process because this requires collaboration and development from new suppliers. To be selected, a supplier must meet the company's product specifications and business objectives. A range of numerical, and statistical approaches are used to help with the final decision. The case company uses an evaluation process to help select the supplier with the greatest overall performance.

The thesis also addressed supplier classification. A variety of portfolio models can be used to help classify suppliers and strategically separate them into different categories. In the theoretical part of this thesis, the Kraljic (1983) portfolio model was used to classify suppliers. The Kraljic Portfolio model categorizes procurement and its suppliers based on their strategic importance and the complexity of the supplier market. It includes routine, volume, strategic, and bottleneck products. From the case company's standpoint, not all purchases are strategically comparable, therefore different purchases and suppliers must be approached and handled separately. The selection criteria for suppliers are heavily influenced by the strategic importance of the product that is being purchased. The higher the procurement risk and the following effect of the purchase, the more important the supplier and the more accurately the suppliers should be evaluated.

Strategic purchases such as strategic and bottleneck products involve a significant level of procurement risk, which is why long-term factors influence the supplier selection process.

Operations should be focused on collaboration, engagement, and development. It is important to form strategic partnerships with suppliers to reduce procurement risks through trust and commitment. Nevertheless, technology and supplier quality are important in these categories, particularly with complicated products. Similarly, non-strategic products such as routine and volume products influence supplier selection in these categories in terms of price, supply security, and logistics.

In the context of the case company's high-mix, low-volume production, supplier selection has an unbreakable relationship to the sustainability requirements. Given the ongoing development of new products as well as the rapid evolution of current ones, suppliers are more than just suppliers. They are strategic partners who must align with the company's sustainability objectives.

Flexibility and a cooperative mentality are essential in this changing environment. Suppliers must demonstrate a commitment to sustainable production approaches, adaptability to the changing product landscape, and a willingness to collaborate. Raute prioritizes suppliers who actively contribute to sustainable projects, participate in collaborative activities, and commit to long-term collaboration. Sustainability has to be emerged as a critical consideration in supplier selection process. The focus on collaboration and commitment to sustainable practices demonstrates the company's understanding that the environmental influence of suppliers is a significant factor in the selection process. The spotlight on sustainability is deeply rooted in the company's unique business environment, which is defined by its manufacturing process, underlining the company's commitment to environmentally responsible.

The supplier selection process is a complicated and changing process that requires careful evaluation of several factors. Data collecting is essential requiring effective use of existing sources and careful evaluation of potential suppliers. The evaluation approach, which includes measurable and comparable criteria is critical for making detailed decisions and ensuring efficient supplier selection.

Although pricing is essential criteria, but it is only a tiny part of total procurement costs like the tip of an iceberg. Understanding price formation and manufacturing cost principles is essential for an accurate cost analysis. An advanced approach is also essential when selecting suppliers, considering aspects such as market fairness and constant risk evaluation.

The importance of quality cannot be stressed, as it affects the success of the company and its reputation. Sustainable supplier selection and in lining with ESG standards has become essential with companies such as Raute, addressing environmental and social factors in their evaluation process. The implementation of sustainability certifications and responsible sourcing processes underlines the company's commitment to environmental responsibility.

Raute's comprehensive strategy goes beyond supplier selection to include long-term development, environmental sustainability, and cutting-edge technology. The company's "Handprint" idea, which promotes a circular economy, waste reduction, and positive environmental impacts, illustrates its commitment to global sustainability goals. Raute's requirements are constantly adjusted to changing market realities, its future strategy shows a comprehensive combination of environmental responsibility, technical innovation, and a people-centric attitude. Overall, Raute's supplier selection strategy reflects the company's broader commitment, promoting a resilient, competitive, and sustainable supply chain in the wood products business.

Nevertheless, the thesis focuses on the evaluation of the supplier selection process from the perspective of the case company, which limits the research. For further research it would be beneficial to conduct additional research on this topic with more case companies in the same industry. Also, it important to consider comparing research outcomes across other case companies to identify resembles and variations in the supplier selecting process.

## References

- Alikhani, R. et al. (2019) Strategic supplier selection under sustainability and risk criteria. *International journal of production economics*. [Online] 20869–82.
- AlMaian, R.Y. et al. (2016) ‘A qualitative data analysis for supplier quality-management practices for Engineer-procure-construct projects’, *Journal of Construction Engineering and Management*, 142(2), pp. 3–8. doi:10.1061/(asce)co.1943-7862.0001046.
- Alzaman, C., Zhang, Z.-H. and Diabat, A. (2018) ‘Supply Chain Network design with direct and indirect production costs: Hybrid gradient and local search-based heuristics’, *International Journal of Production Economics*, 203, pp. 203–215. doi:10.1016/j.ijpe.2018.06.004.
- Andrade, C. (2020) ‘The inconvenient truth about convenience and purposive samples’, *Indian Journal of Psychological Medicine*, 43(1), pp. 86–88. doi:10.1177/0253717620977000.
- Arvopaperi (2023) Raute Oyj: Raute Corporation’s financial reporting and Annual general meeting in 2024, Arvopaperi. Available at: <https://www.arvopaperi.fi/porssitiedotteet/raute-oyj-raute-companies-financial-reporting-and-annual-general-meeting-in-2024/8c2caa88-fcd2-518d-b3e4-d299ac6ed18d> (Accessed: 20 December 2023).
- Asefa, T. et al. (2014) A tale of integrated regional water supply planning: Meshing socio-economic, policy, governance, and sustainability desires together. *Journal of hydrology* (Amsterdam). [Online] 519, pp. 2632–2641.
- Baily, Peter. (1998) *Purchasing principles and management*. 8th ed. London: Financial Times, pp. 241-244.
- Bhattacharjee, S., (2022). 6 Stages Of Vendor Development: Best Tips To Choose Your True Vendor - SignalX AI [online]. SignalX AI. Available from: <https://signalx.ai/blog/6-stages-of-vendor-development/> (Accessed: 16 February 2024).
- Blenkhorn, D. L., & Banting, P. M. (1991). How reverse marketing changes buyer—seller roles. *Industrial Marketing Management*, 20(3), 185–191. [https://doi.org/10.1016/0019-8501\(91\)90016-9](https://doi.org/10.1016/0019-8501(91)90016-9)

- Burkinshaw, A. (2024, January 2). ESG regulation in 2024: Everything you need to know. Sustainable Future News. <https://sustainablefuturenews.com/policy-and-regulation/2024-guide-to-esg-regulation/>
- Calisir, F. & Durucu, M. (2023) ‘Evaluating the Criteria in the Dimensions of the Kraljic Purchasing Portfolio Matrix’, in *Industrial Engineering in the Covid-19 Era*. [Online]. Switzerland: Springer. pp. 42–51.
- Castro e Silva, A. d., Seleme, R., de Assis Silva, W., Zattar, I. C., Nara, E. O. B., Júnior, O. C., & Benitez, L. B. (2022). Evaluation and Choice Criteria of Sustainable Suppliers in the Construction Industry: A Comparative Study in Brazilian Companies. *Sustainability*, 14(23), 15711. <https://doi.org/10.3390/su142315711>
- Chai, J. and Ngai, E.W.T. (2020) ‘Decision-making techniques in supplier selection: Recent accomplishments and what lies ahead’, *Expert Systems with Applications*, 140. doi:10.1016/j.eswa.2019.112903.
- Chang, J.-P. et al. (2023) Requirement-driven sustainable supplier selection: Creating an integrated perspective with stakeholders’ interests and the wisdom of expert crowds. *Computers & industrial engineering*. [Online], Vol 175.
- Chang, W.-S. and Lin, Y.-T. (2019) ‘The effect of lead-time on Supply Chain Resilience Performance’, *Asia Pacific Management Review*, 24(4), pp. 298–309. doi:10.1016/j.apmr.2018.10.004.
- Che, Z. H., & Wang, H. S. (2008). Supplier selection and supply quantity allocation of common and non-common parts with multiple criteria under multiple products. *Computers & Industrial Engineering*, 55(1), 110–133. <https://doi.org/10.1016/j.cie.2007.12.005>
- Chu, D. X. (2013) The Clarification of Discarded Factors Helping Promote Product Sustainability. *Applied Mechanics and Materials*. [Online] 437 (Industrial Design and Mechanics Power II), pp.1005–1011.
- Company (2023) Raute Corporation receives order of EUR 93 million to Finland, MarketScreener. Available at: <https://www.marketscreener.com/quote/stock/RAUTE-OYJ-1412530/news/Raute-Corporation-Receives-Order-of-EUR-93-Million-to-Finland-45306359/> (Accessed: 02 December 2023).

- Contador, J. L., Contador, J. C., Terriaga, K. d. A., Santos, A. R. d., Satyro, W. C., & Araújo, J. L. d. (2022). Seleção de fornecedores pela ótica da vantagem competitiva. *Research, Society and Development*, 11(5), Article e20111528147. <https://doi.org/10.33448/rsd-v11i5.28147>
- Coombs, H. V. (2022) “Case Study Research Defined [White paper]”. Zenodo. doi: 10.5281/zenodo.7604301.
- Costantino, N. and Pellegrino, R. (2010) ‘Choosing between single and multiple sourcing based on supplier default risk: A real options approach’, *Journal of Purchasing and Supply Management*, 16(1), pp. 27–40. doi:10.1016/j.pursup.2009.08.001.
- Dost, Mir, Yuosre F. Badir, Zeeshan Ali, and Adeel Tariq. 2016. “The Impact of Intellectual Capital on Innovation Generation and Adoption.” *Journal of Intellectual Capital* 17(4):675–95.
- Dwyer, F. R., Leenders, M. R., & Blenkhorn, D. L. (1989). Reverse Marketing: The New Buyer-Supplier Relationship. *Journal of Marketing*, 53(2), 129. <https://doi.org/10.2307/1251420>
- Ehsan, Sadaf, Adeel Tariq, Mian Sajid Nazir, Malik Shahzad Shabbir, Rizwan Shabbir, Lydia Bares Lopez, and Wasim Ullah. 2022. “Nexus between Corporate Social Responsibility and Earnings Management: Sustainable or Opportunistic.” *Managerial and Decision Economics* 43(2):478–95.
- Erridge, A. (1995) *Managing purchasing: Sourcing and contracting*, Internet Archive. Oxford (UK): Butterworth Heinemann, pp. 75-82, 84-92. Available at: <https://archive.org/details/managingpurchasi0000erri/page/218/mode/2up> (Accessed: December 2023).
- Finley, P. (2023) *Tackling the monopoly: How to negotiate with monopoly...*, PA Consulting. Available at: <https://www.paconsulting.com/insights/tackling-the-monopoly-how-to-negotiate-with-monopoly-suppliers-to-release-surprising-value> (Accessed: 10 January 2024).
- Friedrich, A. et al. (2022) Make-or-buy decisions for industrial additive manufacturing. *Journal of business logistics*. [Online] 43 (4), pp. 623–653.

Garzon, F. S. et al. (2019) A green procurement methodology based on Kraljic Matrix for supplier's evaluation and selection: a case study from the chemical sector. *Supply chain forum*. [Online] 20 (3), pp. 185–201.

Gerpott, T. J. and Berends, J., (2022). Competitive pricing on online markets: a literature review. *Journal of Revenue and Pricing Management* [online]. Available from: doi: 10.1057/s41272-022-00390-x (Accessed: 19 February 2024).

Ghodsypour, S.H. and O'Brien, C. (1998) 'A decision support system for supplier selection using an integrated analytic hierarchy process and linear programming', *International Journal of Production Economics*, 56–57, pp. 199–212. doi:10.1016/s0925-5273(97)00009-1.

Goasduff, L. (2022) Gartner survey shows 75% of companies are pursuing security vendor consolidation in 2022, Gartner. Available at: <https://www.gartner.com/en/newsroom/press-releases/2022-09-12-gartner-survey-shows-seventy-five-percent-of-companies-are-pursuing-security-vendor-consolidation-in-2022> (Accessed: 26 December 2023).

Goehlich, R.A. (2009) 'Development of a Make-or-Buy Decision-supporting Process', in *Make-or-buy decisions in aerospace companies essays on Strategic Efficiency Improvements*. Wiesbaden: Gabler, pp. 39–47. pp. 39-47

Gohar, Madiha, Ayesha Abrar, and Adeel Tariq. 2022. "The Role of Family Factors in Shaping the Entrepreneurial Intentions of Women: A Case Study of Women Entrepreneurs from Peshawar, Pakistan." *The Role of Ecosystems in Developing Startups: Frontiers in European Entrepreneurship Research* 40.

Goldberg, M.H. et al. (2019) Convenient but biased? the reliability of convenience samples in research about attitudes toward climate change [Preprint]. doi:10.31219/osf.io/2h7as.

Golobrodska, M. (2024) Procurement strategy. how to get it right? [guide + template], Precoro Procurement and Spend Management Blog. Available at: <https://precoro.com/blog/procurement-strategy/> (Accessed: 06 February 2024).

Govindan, K., Shankar, M. and Kannan, D. (2018) 'Supplier selection based on Corporate Social Responsibility Practices', *International Journal of Production Economics*, 200, pp. 353–379. doi:10.1016/j.ijpe.2016.09.003 (Accessed: 8 March 2024).

Guarnieri, P. & Trojan, F. (2019) Decision making on supplier selection based on social, ethical, and environmental criteria: A study in the textile industry. *Resources, conservation and recycling*. [Online] 141, pp. 347–361.

Hamdan, S. & Cheaitou, A. (2017) Supplier selection and order allocation with green criteria: An MCDM and multi-objective optimization approach. *Computers & operations research*. [Online] 81, pp. 282–304.

Harrison, M. and Thompson, K. (2022) 'Procurement and supply chain resilience in the face of global disruption', *Procurement and supply chain resilience in the face of global disruption. A survey by Deloitte in partnership with Chartered Institute of Procurement & Supply* [Preprint]. Available at: <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/consultancy/deloitte-uk-procurement-and-supply-chain-resilience.pdf> (Accessed: 25 December 2023).

Hines, T. (2002) 'Developing an iceberg theory of cost comparisons in relation to sourcing decisions by UK fashion retailers', *Journal of the Textile Institute*, 93(3), pp. 3–14. doi:10.1080/00405000208658354.

Hoffer Gittell, J. (2012) 'New Directions for Relational Coordination theory', *Oxford Handbooks Online* [Preprint]. doi:10.1093/oxfordhb/9780199734610.013.0030.

Huth, C., Kieckhäfer, K. and Spengler, T.S. (2015) 'Make-or-buy strategies for electric vehicle batteries—a simulation-based analysis', *Technological Forecasting and Social Change*, 99, pp. 22–34. doi:10.1016/j.techfore.2015.06.027.

Hutt, M. D. & Speh, T. W. (2010) *Business marketing management: B2B*. 10th ed. Mason (OH): South-Western Cengage Learning, pp. 162-175.

Javadi, S., Bruch, J. and Bellgran, M. (2016) 'Characteristics of product introduction process in low-volume manufacturing industries', *Journal of Manufacturing Technology Management*, 27(4), pp. 535–559. doi:10.1108/jmtm-03-2015-0017.

Johnsen, T. E., (2009). Supplier involvement in new product development and innovation: Taking stock and looking to the future. *Journal of Purchasing and Supply Management* [online]. 15(3), 187–197. Available from: doi: 10.1016/j.pursup.2009.03.008 (Accessed: 17 February 2024).

- Juergens, E. (2015) How to write a case study, Thesis Guide. Available at: <https://thesisguide.org/2015/03/20/how-to-write-a-case-study/> (Accessed: 23 March 2024).
- Kandil, N., Hammami, R., & Battaïa, O. (2022). Insourcing versus outsourcing decision under environmental considerations and different contract arrangements. *International Journal of Production Economics*, 108589. <https://doi.org/10.1016/j.ijpe.2022.108589>
- Kannan, V. R. and Tan, K. C., (2002). Supplier Selection and Assessment: Their Impact on Business Performance. *The Journal of Supply Chain Management* [online]. 38(4), 11–21. Available from: doi: 10.1111/j.1745-493x.2002.tb00139.x (Accessed: 17 February 2024).
- Koufteros, X., Vickery, S.K. and Dröge, C. (2012) ‘The effects of strategic supplier selection on buyer competitive performance in matched domains: Does supplier integration mediate the relationships?’, *Journal of Supply Chain Management*, 48(2), pp. 93–115. doi:10.1111/j.1745-493x.2012.03263.x.
- Kraljic, P. (1983) *Purchasing must become supply management*. Vol. 61. Boston: Harvard Business School Press.
- Langedal, B., (2023). Supplier evaluation and assessment: The what, how, and why [online]. Ignite - Get a full picture of your suppliers. Available from: <https://www.ignite.no/blog/supplier-evaluation-and-assessment-the-what-how-and-why> (Accessed: 16 February 2024).
- Lasch, R. and Janker, C. G., (2005). Supplier selection and controlling using multivariate analysis. *International Journal of Physical Distribution & Logistics Management* [online]. 35(6), 409–425. Available from: doi: 10.1108/09600030510611648 (Accessed: 16 February 2024).
- Liu, H.-C., & You, X.-Y. (2021). Green Supply Chain Management. In *Green Supplier Evaluation and Selection: Models, Methods, and Applications* (pp. 1–11). Springer Singapore. [https://doi.org/10.1007/978-981-16-0382-2\\_1](https://doi.org/10.1007/978-981-16-0382-2_1)
- Lockamy, A. & McCormack, K. (2010) Analysing risks in supply networks to facilitate outsourcing decisions. *International journal of production research*. [Online] 48 (2), pp. 593–611.

- Luo, A. (2023) Content analysis: Guide, methods & examples, Scribbr. Available at: <https://www.scribbr.com/methodology/content-analysis/> (Accessed: 02 February 2024).
- Maromonte, K. R. (1998). Corporate strategic business sourcing. Quorum Books, pp. 25-34).
- Melander, L., (2018). Customer and Supplier Collaboration in Green Product Innovation: External and Internal Capabilities. *Business Strategy and the Environment* [online]. 27(6), 677–693. Available from: doi: 10.1002/bse.2024 (Accessed: 17 February 2024).
- Morrison, M., (2021). Porter's Five Forces - Competitor Analysis (Michael Porter) [online]. RapidBI. Available from: <https://rapidbi.com/porters-five-forces-competitor-analysis-michael-porter/> (Accessed: 03 February 2024).
- Morsy, H.M. (2014) Buyer-supplier relationships and the effect of power balance on ..., ResearchGate. Available at: [https://www.researchgate.net/publication/322399875\\_Buyer-Supplier\\_Relationships\\_and\\_the\\_effect\\_of\\_Power\\_Balance\\_on\\_Innovative\\_Knowledge\\_Exchange](https://www.researchgate.net/publication/322399875_Buyer-Supplier_Relationships_and_the_effect_of_Power_Balance_on_Innovative_Knowledge_Exchange) (Accessed: 26 December 2023).
- Moschuris, S.J. (2015) 'Decision-making criteria in tactical make-or-buy issues: An empirical analysis', *EuroMed Journal of Business*, 10(1), pp. 2–20. doi:10.1108/emjb-02-2014-0010.
- Mwikali, R. & Kavale, Dr. (2012). Factors affecting the selection of optimal suppliers in procurement management. *International Journal of Humanities and Social Science*. 2. 189-193.
- Napel, S. and Welter, D. (2023) 'Umbrella Pricing and cartel size', *International Journal of Industrial Organization*, 91, p. 103032. doi:10.1016/j.ijindorg.2023.103032.
- Negash, Y. T. et al. (2020) A novel approach to measure product quality in sustainable supplier selection. *Journal of cleaner production*. [Online] 252, p. 119838.
- Nenavani, J. & Jain, R. K. (2022) Examining the impact of strategic supplier partnership, customer relationship and supply chain responsiveness on operational performance: the moderating effect of demand uncertainty. *The Journal of business & industrial marketing*. [Online] 37 (5), pp. 995–1011.

Noori-Daryan, M. et al. (2019) Analyzing pricing, promised delivery lead time, supplier-selection, and ordering decisions of a multi-national supply chain under uncertain environment. *International journal of production economics*. [Online] 209, pp. 236–248.

Octavio Hernández Castorena et al. (2015) The impact of strategies, and collaboration agreements with suppliers: key elements performance of manufacturing SMEs in Aguascalientes, México. *Revista CEA*. [Online] 1 (2), pp. 15–24.

Oke, A., Maltz, A. and Erik Christiansen, P. (2009) ‘Criteria for sourcing from developing countries’, *Strategic Outsourcing: An International Journal*, 2(2), pp. 145–164. doi:10.1108/17538290910973367.

Our journey Raute Oyj (2023) Raute.com. Available at: <https://www.raute.com/company/our-journey/> (Accessed: 20 October 2023).

Pagell, M. and Shevchenko, A., (2014). Why Research in Sustainable Supply Chain Management Should Have no Future. *Journal of Supply Chain Management* [online]. 50(1), 44–55. Available from: doi: 10.1111/jscm.12037 (Accessed: 16 February 2024).

Parvaneh, A. and Akbari, V. (2022) ‘Negotiation processes: Tactics of preparing a successful negotiation’, *International journal of Innovation in Marketing Elements*, 2(1), pp. 51–58. doi:10.59615/ijime.2.1.51.

Patil, V. et al. (2022) ‘Supplier sustainability: A comprehensive review and future research directions’, *Sustainable Manufacturing and Service Economics*, 1, p. 100003. doi:10.1016/j.smse.2022.100003.

Persson, J. (2023) The value-based price: Profit by solving real client problems, Leancept. Available at: <https://www.leancept.com/articles/the-value-based-price-profit-by-solving-real-client-problems> (Accessed: 02 January 2024).

Pishchulov, G. et al. (2019) ‘The voting Analytic Hierarchy Process Revisited: A revised method with application to sustainable supplier selection’, *International Journal of Production Economics*, 211, pp. 166–179. doi:10.1016/j.ijpe.2019.01.025.

Porter, M. E. (1998) *Competitive strategy: techniques for analyzing industries and competitors*. New York: Free Press. pp. 16-22.

Preeya, D. (2022, November 30). Guide to Sustainable Product Design: A Sustainability Roadmap for Manufacturers. PTC. <https://www.ptc.com/en/blogs/plm/guide-to-sustainable-product-design>

Priya, A. (2020) ‘Case study methodology of qualitative research: Key attributes and navigating the conundrums in its Application’, *Sociological Bulletin*, 70(1), pp. 94–110. doi:10.1177/0038022920970318.

Probert, D. R. (1996) The practical development of a make or buy strategy: the issue of process positioning. *Journal of manufacturing technology management*. 7 (2), p.44.

Queiroz, G. A., Filho, A. G. A. and Costa Melo, I., (2023). Competitive Priorities and Lean–Green Practices—A Comparative Study in the Automotive Chain’ Suppliers. *Machines* [online]. 11(1), 50. Available from: doi: 10.3390/machines11010050 (Accessed: 16 February 2024).

Rashid, Robina, Yuosre F. Badir, Adeel Tariq, and Bilal Afsar. 2022. “The Role of Product Lines in Determining the Degree and Speed of Integration: Evidence from the Pharmaceutical MNCs in Cross-Border Acquisitions.” *European Journal of International Management* 17(1):27–59.

Rashid, Y., Rashid, A., Warraich, M. A., Sabir, S. S., & Waseem, A. (2019). Case Study Method: A Step-by-Step Guide for Business Researchers. *International Journal of Qualitative Methods*, 18. <https://doi.org/10.1177/1609406919862424>

Raute corporation (2023) raute.com. Available at: <https://www.raute.com/company/> (Accessed: 02 December 2023).

Raute Governance. (2023). raute.com. <https://www.raute.com/investors/governance/>

Raute Oyj (2023) Q3/2023 Interim report. publication. Raute Oyj, pp. 3–10.

Raute Oyj. (2024). Value chain and sustainability. Raute.com. <https://www.raute.com/sustainability/>

Rezaei, J. et al. (2016) ‘A supplier selection life cycle approach integrating traditional and environmental criteria using the best worst method’, *Journal of Cleaner Production*, 135, pp. 577–588. doi:10.1016/j.jclepro.2016.06.125.

- Roehrich, J. K. et al. (2017) Driving green supply chain management performance through supplier selection and value internalisation: A self-determination theory perspective. *International journal of operations & production management*. [Online] 37 (4), pp. 489–509.
- Ruane, B. (2022) Gartner Survey reveals 51% of supply chain leaders increased the number of network locations in the past two years, Gartner. Available at: <https://www.gartner.com/en/newsroom/press-releases/2022-08-02-gartner-survey-reveals-51-percent-of-supply-chain-leaders-increased-the-number-of-network-locations-in-the-past-two-years> (Accessed: 07 January 2024).
- Salavati, M. et al. (2016) ‘Improving new product development performance by risk management’, *Journal of Business & Industrial Marketing*, 31(3), pp. 418–425. doi:10.1108/jbim-04-2013-0090.
- Saunders, M. (1997) *Strategic Purchasing Supply Chain Management*. 2nd edn. Harlow, England: Financial Times/Prentice Hall. pp. 160-164, 269-271.
- Schiele, H. & Vos, F. G. S. (2015) Dependency on suppliers as a peril in the acquisition of innovations? The role of buyer attractiveness in mitigating potential negative dependency effects in buyer–supplier relations. *Australasian marketing journal*. [Online] 23 (2), pp. 139–147.
- Schniederjans, M.J., Schniederjans, A.M. and Schniederjans, D.G. (2015) *Outsourcing and insourcing in an international context*. Armonk: Taylor and Francis. pp. 4-17
- Schramm, V.B., Cabral, L.P. and Schramm, F. (2020) ‘Approaches for supporting sustainable supplier selection - A literature review’, *Journal of Cleaner Production*, 273, p. 123089. doi:10.1016/j.jclepro.2020.123089.
- Schumm, C. Z. & Niehm, L. S. (2023) Supplier selection at the base of the chain: navigating competing institutional logics for shared mutual value. *International journal of operations & production management*. [Online]
- Sfiligoj, E. (2017) Market Pressure Leading to Supplier Consolidation. *Croplife*. 180 (10), 22–25.
- Shares (2023) Raute.com. Available at: <https://www.raute.com/investors/shares/> (Accessed: 01 November 2023).

- Shih, W.C. (2022) Are the risks of global supply chains starting to outweigh the rewards? Harvard Business Review. Available at: <https://hbr.org/2022/03/are-the-risks-of-global-supply-chains-starting-to-outweigh-the-rewards> (Accessed: 26 December 2023).
- Steinle, C. and Schiele, H. (2008) 'Limits to global sourcing?', *Journal of Purchasing and Supply Management*, 14(1), pp. 3–14. doi:10.1016/j.pursup.2008.01.001.
- Stojanov, T. and Ding, X. (2016) Supplier selection for mixed-model production: A case study from the apparel industry, Academia.edu. Available at: [https://www.academia.edu/28540416/Supplier\\_Selection\\_for\\_Mixed\\_Model\\_Production\\_A\\_Case\\_Study\\_from\\_the\\_Apparel\\_Industry](https://www.academia.edu/28540416/Supplier_Selection_for_Mixed_Model_Production_A_Case_Study_from_the_Apparel_Industry) (Accessed: 23 March 2024).
- Sumbal, Muhammad Saleem, Murad Ali, Umar Farooq Sahibzada, Faisal Nawaz Mir, Adeel Tariq, and Hina Munir. 2021. "Big Data Based Knowledge Management vs. Traditional Knowledge Management: A People, Process and Technology Perspective." *Journal of Information Science & Engineering* 37(5).
- Sun, F. et al. (2023) The platform's store-brand supplier selection and quality information provision decisions. *Information & management*. [Online] 60 (8), p. 103885-.
- Sundtoft Hald, K., & Ellegaard, C. (2011a). Supplier evaluation processes: the shaping and reshaping of supplier performance. *International Journal of Operations & Production Management*, 31(8), 888–910. (pp. 4-5) <https://doi.org/10.1108/01443571111153085>
- Sverdrup, H. U. et al. (2017) An assessment of metal supply sustainability as an input to policy: security of supply extraction rates, stocks-in-use, recycling, and risk of scarcity. *Journal of cleaner production*. [Online] 140, pp. 359–372.
- Taherdoost, H., & Brard, A. (2019). Analyzing the Process of Supplier Selection Criteria and Methods. *Procedia Manufacturing*, 32, pp. 1024–1034. <https://doi.org/10.1016/j.promfg.2019.02.317>
- Tanskanen, K. and Aminoff, A. (2015) 'Buyer and supplier attractiveness in a strategic relationship — a dyadic multiple-case study', *Industrial Marketing Management*, 50, pp. 128–141. doi:10.1016/j.indmarman.2015.04.011.
- Tariq, Adeel, Sadaf Ehsan, Yuosre F. Badir, Mumtaz Ali Memon, and Muhammad Saleem Ullah Khan Sumbal. 2022. "Does Green Process Innovation Affect a Firm's Financial Risk?"

The Moderating Role of Slack Resources and Competitive Intensity.” *European Journal of Innovation Management*.

Tariq, Adeel, Yuosre Badir, and Supasith Chonglertham. 2019. “Green Innovation and Performance: Moderation Analyses from Thailand.” *European Journal of Innovation Management*.

Team, V. (2023, February 13). Supplier Relationship Management Success: 7 Key Elements. Vendorful - Supplier Relationship Management and e-Sourcing. <https://vendorful.com/supplier-relationship-management-key-elements-of-success/>

Thakkar, J., Kanda, A., & Deshmukh, S. G. (2007). Evaluation of buyer-supplier relationships using an integrated mathematical approach of interpretive structural modeling (ISM) and graph theoretic matrix. *Journal of Manufacturing Technology Management*, 19(1), 92–124. <https://doi.org/10.1108/17410380810843471>

Tomeczek, F. (2022) ‘The evolution of Japanese Keiretsu Networks: A review and text network analysis of their perceptions in economics’, *Japan, and the World Economy*, 62, p. 101132. doi:10.1016/j.japwor.2022.101132.

Vahidi, F. et al. (2018) Sustainable supplier selection and order allocation under operational and disruption risks. *Journal of cleaner production*. [Online] 174, pp.1351–1365.

Van, W.A.J. (2014) *Purchasing et supply chain management: Analysis, Strategy, Planning and Practice*. Andover: Cengage Learning. pp. 100-120

Vastuu Group. (2024). Vastuu Group. Reliable partner. <https://www.vastuugroup.fi/fi-en/our-services/reliable-partner>

Villena, V.H. and Gioia, D.A. (2020) A more sustainable supply chain, *Harvard Business Review*. Available at: <https://hbr.org/2020/03/a-more-sustainable-supply-chain> (Accessed: 08 March 2024).

Weele, A. J. van. (1997) *Purchasing management: analysis, planning, and practice*. Repr. London: International Thomson Business Press. (pp. 119-120, 227-230).

Weidner, K. (2022) Across time and space: Psychological distance and inventory decision making, *Phys.org*. Available at: <https://phys.org/news/2022-11-space-psychological-distance-decision.html> (Accessed: 20 December 2023).

Wichmann, Julian RK, Abhinav Uppal, Amalesh Sharma, and Marnik G. Dekimpe. 2022. "A Global Perspective on the Marketing Mix across Time and Space." *International Journal of Research in Marketing* 39(2):502–21.

Wolszczak-Derlacz, J. and Parteka, A. (2016) 'The effects of offshoring to low-wage countries on domestic wages: A worldwide industrial analysis', *Empirica*, 45(1), pp. 129–163. doi:10.1007/s10663-016-9352-4.

Wu, C., Lin, Y. and Barnes, D. (2021) 'An integrated decision-making approach for sustainable supplier selection in the chemical industry', *Expert Systems with Applications*, 184, p. 115553. doi:10.1016/j.eswa.2021.115553 (Accessed: 8 March 2024).

Wu, Z., Choi, T. Y. and Rungtusanatham, M. J., (2009). Supplier-supplier relationships in buyer-supplier-supplier triads: Implications for supplier performance. *Journal of Operations Management* [online]. 28(2), 115–123. Available from: doi: 10.1016/j.jom.2009.09.002 (Accessed: 16 February 2024).

Yadavalli, V. S., Darbari, J. D., Bhayana, N., Jha, P. C. and Agarwal, V., (2019). An integrated optimization model for selection of sustainable suppliers based on customers' expectations. *Operations Research Perspectives* [online]. 6, 100113. Available from: doi: 10.1016/j.orp.2019.100113 (Accessed: 17 February 2024).

Yang, S. et al. (2021) Supplier's cooperation strategy with two competing manufacturers under wholesale price discount contract considering technology investment. *Soft computing* (Berlin, Germany). [Online] 25 (15), pp. 10381–10398.

Yarbrough, Q., (2021). Production Planning in Manufacturing: Best Practices for Production Plans [online]. ProjectManager. Available from: <https://www.projectmanager.com/blog/production-planning> (Accessed: 16 February 2024).

Yu, C. (2015) 'Agent-based supplier selection model for multiple products with Synergy effect', An agent-based negotiation model for supplier selection of multiple products with synergy effect [Preprint]. doi:10.5353/th\_b4961771.

Yu, Y. & Huo, B. (2019) The impact of relational capital on supplier quality integration and operational performance. *Total quality management & business excellence*. [Online] 30 (11–12), pp. 1282–1301.

Zeng, F. et al. (2015) 'Understanding distributor opportunism in a horizontal network', *Industrial Marketing Management*, 46, pp. 171–182. doi:10.1016/j.indmarman.2015.01.018.

Zhan, Yuanzhu, Leanne Chung, Ming K. Lim, Fei Ye, Ajay Kumar, and Kim Hua Tan. 2021. "The Impact of Sustainability on Supplier Selection: A Behavioural Study." *International Journal of Production Economics* 236:108118 (Accessed: 8 March 2024).

Zhang, X. et al. (2019) 'Product design: Incorporating make-or-buy analysis and supplier selection', *Chemical Engineering Science*, 202, pp. 357–372. doi:10.1016/j.ces.2019.03.021.

## Appendix 1. Interview questions and answers about ESG

Satu Kaivonen (Raute's ESG manager)

Questions and answers:

1. Can you give an overview of how Raute applies ESG (Environmental, Social, and Governance) standards into its operations?

*I have been at the company for a bit over 2 months, so I would ask more evidence from operational roles. Raute applies its ESG strategy i.e. in product development, safety, people practices, procurement and on the shop floor (Nastola's ISO 14001). We have still a long way to go but we aim to apply ESG in all operation, from sales to deliveries.*

2. Last year, Raute introduced ambitious targets for its 2023-2028 strategy in terms of environmental responsibility, sustainability, and technology. How does Raute constantly improve its own operations to better align with evolving ESG standards and expectations?

*Like said, we do have a long way to go still, but we have started by gathering a good overview on current status and processes. We know how much more the new CSRD regulation will demand from us, so we are in the middle of building CSRD compliance. We have had stakeholder discussions with our clients and tech partners as well as asked the opinions of our own employees on ESG. We actively participate in research, scan the market, have a fairly good understanding about the ESG regulation development in Europe in the coming years and plan to do a more a thorough review of the sustainability of our supply chain in the future. We started with our our ESG risks and build our way towards taking advantage of all the opportunities that robust ESG work provides to the value chain.*

3. As an ESG manager, what role do you play in the supplier selection process, particularly in evaluating and considering ESG aspects?

*As said, I have been at the company for a bit over 2 months, so I do not have an active role in supplier selection. We have however had good discussions with the procurement team (Finland) on developing more robust minimum ESG criteria for supplier selection that will be implemented globally. Current model for supplier selection, please ask Kai Huuhtanen.*

4. The ESG reporting directive went into force on January 1, 2024. Is Raute considering including ESG as part of their supplier selection criteria? If so, have there been any challenges in implementing ESG criteria into the supplier selection process, and how has it been addressed or overcome these challenges?

*We have not started the implementation of CSRD criteria yet. CSRD criteria focuses mostly on Raute itself, but demands that we include data from supply chain, i.e. scope 3 emissions. We will amend our Supplier Handbook and implement it as a global tool that dictates the minimum requirements for suppliers once we have a good understanding of all required data points. For current situation, please ask Joona Vähä-Antila*

## Appendix 2. Interview questions and answers about purchasing and R&D

Sustainable supplier selection questions and answers Hanna Vilppula (Purchasing & R&D)

Questions and answers:

1. In your previous role as a purchaser, how did you include environmental aspects in the procurement process? Did you prefer domestic suppliers over overseas suppliers? How did you prioritize sustainability when selecting suppliers for component buying decisions?

*Suosin paikallisia toimittajia, ellei esim. kiinalaisella valmistajalla ole merkittävää hintaetua kotimaiseen verrattuna. Kiinasta hankittavien nimikkeiden lukumäärä on kaiken kaikkiaan hyvin pieni ja trendi on mieluummin lisätä kotimaasta hankintaa kuin hankintaa Kiinasta. Lentorahtia pyritään välttämään paitsi kustannuksien, myös ilmastonäkökulmien vuoksi. Pyritään ostamaan isompia määriä kerralla, jotta kuljetuskulut ja kuormitus ympäristölle olisi yhtä yksikköä kohti pienemmät. Käytännössä ostetaan esimerkiksi kuukauden tarve kerralla sen sijaan, että varastoa täydennetään jonkin nimikkeen osalta viikoittain.*

*Priorisoin toimittajavalinnassa sellaisia tukkureita, joiden tiedän tekevän vastuullista hankintaa. Esim. Kesko, joka omistaa nykyisin Onnisen, on noussut maailman vastuullisimmaksi päivittäistavarakaupan yritykseksi.*

Translation:

I prefer local suppliers unless, for example, a Chinese manufacturer has a significant price advantage over a domestic one. Overall, the number of items purchased from China is very small and the trend is to increase domestic purchases rather than purchases from China. Air cargo is being avoided not only because of the cost, but also because of climate factors. Try to buy larger quantities at a time so that transportation costs and environmental burden per unit are reduced. In practice, for example, a monthly need is purchased at a time instead of supplementing the inventory for one item weekly.

I have given priority in the selection of suppliers to wholesalers who I know do responsible procurement. for example. Kesko, which now owns Onninen, has grown to become the world's most responsible retail company.

2. What challenges did you face while promoting sustainability in purchasing, and how did you address or overcome them to maintain sustainable practices throughout the supply chain?

*On vaikea hahmottaa, mihin vastuullisuusaspektiin tulisi eniten laittaa painoarvoa hankintatyössä. Omassa roolissani hankin lähestulkoon pelkkiä lopputuotteita, eli valmiita koneenosia ja komponentteja, joten toimitusketju aina raaka-aineisiin saakka on todella pitkä ja kaikkien vaiheiden vastuullisuuden kartoittaminen on mahdotonta. En myöskään roolissani vastannut toimittajaneuvotteluista tai auditoinneista, jotka olisivat välineitä vastuullisuuskysymyksen esiin nostamiseen. Eli henkilöt, jotka vastaavat toimittajaneuvotteluista, ovat avainasemassa ottaa keskusteluissa esiin, keitä ovat meidän toimittajien alihankkijat ja minkälaista vastuullisuustyötä toimittajamme käytännössä tekevät. On myös tärkeää olla tietoinen, mitkä ovat EU:n määrittämiä riskimaita ja selvittää, mistä näistä maista meidän*

*toimittajamme hankkivat työtä tai materiaalia. Toki myös pidemmällä aikavälillä olisi selvitettävä fossiilivapaan teräksen hankintaan liittyvät mahdollisuudet.*

Translation:

It is difficult to figure out which aspect of responsibility should be most emphasized in procurement work. In my role, I purchase almost exclusively finished products, i.e. finished machine parts and components, so the supply chain from raw materials to raw materials is really long and it is impossible to map the responsibility of all stages. Nor was I in my role responsible for journalist negotiations or audits, which would be instruments to raise accountability issues. That is, the people responsible for supplier negotiations play a key role in highlighting who the subcontractors of our suppliers are and what kind of accountability work the suppliers do in practice. It is also important to be aware of which risk countries are identified by the EU and to find out from which countries our suppliers purchase work or materials. Of course, in the longer term, the possibilities associated with the procurement of fossil-free steel should also be explored.

3. In your current role in research and development, how do you contribute to the implementation of sustainable materials in the product development process, and what role does sustainability play in the selection of materials for new products?

These questions are intended to look into the relationship between purchasing and sustainability from both a procurement and R&D standpoint.

*Tuotekehityksessä yksi tavoite on metallin 3D-tulostuksen käyttökohteiden laajentaminen. 3D-tulostus on varteenotettava vaihtoehto, sillä pääperiaate on käyttää vähemmän materiaalia kuin perinteisissä valmistusmenetelmissä. Toki tuotekehityksessä hyödynnän myös hankinnasta tullutta kokemusta liittyen kestävään hankintaan, eli käytetään auditoituja toimittajia myös uusille tuotekehityksen alaisille tuotteille.*

Translation:

One of the objectives of product development is the expansion of the uses of 3D printing of metal. 3D printing is a good option, as the main principle is to use less material than traditional manufacturing methods. Of course, in product development, I also take advantage of the experience gained from procurement in relation to sustainable purchases, i.e. audited suppliers are also used for new products under product development.

