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Identifying and leveraging customer value drivers for enhancing solution selling in the aggregates business

A case study on machine combination sales

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ABSTRACT:
The production and sale of aggregates plays a critical role in the development of our society, having a significant impact on infrastructure development and construction. The purpose of this study was to identify the factors that drive these markets, such as product requirements and market demand for aggregates products. The study aims to establish how identifying and leveraging customer value drivers can improve solution selling and optimize machine combination sales in the aggregates business. The focus was to identify the factors that create customer value, and how these factors can be used in value-based selling as well as in guided selling approaches. The research was conducted as a qualitative case study using semi-structured interviews.

The results highlight the key value drivers that guide the decision-making of aggregates producers, such as price sensitivity, quality requirements and the importance of the aftermarket. The study identified the most relevant issues affecting product pricing, as well as product quality requirements. The most important characteristics of the machines were identified, and the results show that the efficiency of the machines is the most important characteristic. In turn, the quality image of the brand and the successful implementation of the aftermarket are important factors influencing the purchase of machinery. In the aftermarket, the ability to deliver parts and service quickly is very important.

The study contributes to the understanding of value-based selling and guided selling, with a focus on the aggregates industry. This paper provides practical guidance and recommendations to optimize these sales strategies based on customer needs. The results support the case company in refining its approach to machine recommendations and pricing communication. These are important steps forward in enhancing solution selling in the aggregates business. Future research could focus on the effective implementation of the results of this study, as well as gathering feedback on the usefulness of these tools.

KEYWORDS: Customer value, Value selling, Guided selling, Aggregates business

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TIIVISTELMÄ:
Kiviainesten tuotannolla ja myynnillä on ratkaiseva merkitys yhteiskuntamme kehitykselle, ja sillä on merkittävä vaikutus infrastruktuurin kehittämiseen ja rakentamiseen. Tämän tutkimuksen tarkoituksena oli selvittää näitä markkinoita ohjaavat tekijät, kuten tuotevaatimukset ja kiviainestuotteiden kysyntä. Tutkimuksen tavoitteena on selvittää, miten asiakkaiden arvoon vaikuttavien tekijöiden tunnistaminen ja hyödyntäminen voi parantaa ratkaisumyyntiä ja optimoida koneyhdistelmien myyntiä kiviainesliiketoiminnassa. Tutkimuksessa keskityttiin tunnistamaan asiakasarvoa luovat tekijät ja se, miten näitä tekijöitä voidaan hyödyntää arvoon perustuvassa myynnissä sekä ohjatuissa myyntimenetelmissä. Tutkimus toteutettiin laadullisena tapaustutkimuksena puolistrukturoitujen haastattelujen avulla.

Tuloksissa korostetaan kiviainestuottajien päätöksentekoa ohjaavia keskeisiä arvoon vaikuttavia tekijöitä, kuten hintaherkkyyttä, laatuvaatimuksia ja jälkimarkkinoiden merkitystä. Tutkimuksessa yksilöitiin tärkeimmät tuotteiden hinnoitteluun vaikuttavat tekijät sekä tuotteiden laatuvaatimukset. Koneiden tärkeimmät ominaisuudet tunnistettiin, ja tulokset osoittavat, että koneiden tehokkuus on tärkein ominaisuus. Tuotemerkin laatumielikuva ja jälkimarkkinoiden onnistunut toteuttaminen ovat puolestaan tärkeitä koneiden ostoon vaikuttavia tekijöitä. Jälkimarkkinoilla kyky toimittaa osia ja huoltopalveluja nopeasti on erittäin tärkeää.

Tutkimus edistää arvoperusteisen myynnin ja ohjatun myynnin ymmärtämistä keskittyen kiviainestoimialaan. Tässä asiakirjassa annetaan käytännön ohjeita ja suosituksia näiden myyntistrategioiden optimoimiseksi asiakkaiden tarpeiden perusteella. Tulokset tukevat case-yritystä sen konesuosituksia ja hinnoitteluviestintää koskevan lähestymistavan tarkentamisessa. Nämä ovat tärkeitä edistysaskeleita ratkaisumyynnin tehostamisessa kiviainesalalla. Tulevassa tutkimuksessa voitaisiin keskittyä tämän tutkimuksen tulosten tehokkaaseen toteuttamiseen sekä palautteen keräämiseen näiden välineiden hyödyllisyydestä.

Avainsanat: Asiakasarvo, arvomyynti, ohjattu myynti, kiviainesliiketoiminta.

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1 Introduction

This document is a master's thesis report, related to the pursuit of better sales results through a deeper understanding of customer value drivers and their characteristics, and how they can be used in different sales tactics. The study has been carried out in collaboration with a case study company that is trying to improve the sales performance of the heavy machinery it manufactures. The machines are sold to customers who are businesses themselves. The case company therefore operates in business-to-business (B2B) markets. It is important to understand where customer value comes from in order to influence decision making and thereby improve the case company's sales performance. This study therefore aims to address this problem. This chapter also contains the background of the study, the research question and objectives, and a description of the structure of the study.

1.1 Background

While the development of sales performance is desirable for many sectors, this study will concentrate specifically on the aggregates industry. The aggregates industry is essentially a business sector that focuses on the acquisition, processing, and sale of soil. These soil materials include likes of crushed rock, sand, and gravel. These natural raw materials are indeed widely used in our society, as they are one of the most used natural resources. These materials are essential in construction, for example, as they are needed in all residential, commercial and industrial building construction. They are also used in the construction of roads and bridges, for example.

As our society and population grows around the world, it also means an increase in the amount of infrastructure that needs to be built. This increase in people leads to an increase in the size of cities, and especially buildings, which increases the amount of raw materials needed. This is why aggregates business is important for society as a whole, because raw materials are needed now, and even more in the future. In the US alone,

1.5 billion tons of crushed rock were produced in 2022, worth more than $21 billion. (USGS: U.S. Geological Survey, 2024). This clearly shows that the aggregates market is huge worldwide and has a lot of business potential.

The journey from solid rock to building material is a long one. The case company in this study manufactures machinery for the production of end products from solid soil. This means the point at which the blasted rock is put into the machine manufactured by the company, and smaller rock comes out. So, in all simplicity, bigger rock is made into smaller, higher quality rock. Once the rock meets the quality requirements, it's ready to be sold to the end consumer. While this might sound simple, the machinery required for the process is heavy machinery. That is the machinery that the case company sells, and that is the sale that this study aims to develop.

Competition in the market is getting tougher and this is also true for aggregates crushing equipment. As technology evolves, for example through automation and digitalization, customers are becoming more demanding. Companies operating in this sector are under constant pressure to deliver high-quality, reliable machines that enhance their customers' operational efficiency and reduce costs. In addition to this, environmental awareness in general has increased, so more attention is also being paid to the eco-friendliness of machinery. This means that a company that manufactures machinery must be up to date with the factors that create customer value, be it ecology, high quality, or reliability.

As markets become more competitive, the ability to understand and communicate the value of these machines becomes crucial. According to Keränen et al. (2023), value-based selling (VBS) has become an increasingly important, if not imperative, selling practice in contemporary business-to-business (B2B) markets. Especially in this sector, this is essential because these large machines enable the customer's business by producing the customer's end product. As the importance of value-based selling is recognized, and customer demands are expected to increase, the company aims to shift from product-

focused selling to a more value-driven sales approach. This research is part of that transition.

In summary, the purpose of this study is to identify and use information related to customer value and sales tactics to improve sales. The industry of aggregates business is very crucial now and in the future, so fierce competition in the market is certain. As competition as well as technology evolves, sales must evolve with it. In an ideal situation, the customer's entire production process would be solved, which in practice could mean selling several machines at once. Digital solutions could be used to find a comprehensive solution for the customer, for example using a guided selling tool. Among sales tactics, this study focuses on value-based selling and guided selling.

1.2 Research question, and objectives

The case company wanted to better understand how customer value is created. More specifically, they wanted to move up the value chain to look at the end products of the customer. After all, the customer's end product is how the customer makes their money and around which their whole business is built. Overall, the purpose of this study is to gain insight into customers' end products and the issues that affect them. This information on end products can then be used for sales and marketing purposes.

The research question of the thesis is:

How can identifying and leveraging customer value drivers improve solution selling and optimize machine combination sales in the aggregates business?

In addition to the research question itself, a clear set of objectives is used to guide the research. These objectives strengthen the understanding of the topic, and serve as concrete results in answering the research question. The research objectives give the research a clear direction and focus. They are designed to ensure that the research stays

on track and addresses the key issues. At the same time, they aim to provide a comprehensive picture of what the research is trying to achieve. The objectives of this study are:

- *To identify the key **customer value drivers** that influence purchasing decisions in the aggregates business, focusing on final products of customers.*
- *To examine how **variations in product requirements** (e.g., size, shape, quality of aggregates) and **market demands** affect **pricing and customer profitability** in the B2B aggregates market.*
- *To explore the role of **value-based and guided selling** strategies in enhancing machine combination recommendations that align with customer needs and optimize end-product quality.*
- *To propose actionable strategies for the case company to better guide customers in **selecting machine combinations** that improve product marketability and meet customer-specific demands.*

The idea behind the first objective is to build a broader understanding of the nature of customer value. This will help us to better understand customer behavior and how companies can deliver value to customers. The next objective in this study focuses essentially on the end products of customers in this sector. It is essential to find out what the different requirements are for the products, what the demand for the products is, how they are typically priced, and how these issues interact. One of the main reasons why the case company wants to examine the final products in more detail is essentially linked to the third objective of the study. It will explore how different sales techniques can be used, and at the same time how information about the final products can be combined with these techniques. The combination of the two is the fourth and final objective of the study.

1.3 Research gap and limitations

The table below gives an overview of the existing literature on the subject. The background, research questions and objectives of the study guide us to examine these concepts expressed in the table: customer value, value selling, guided selling (personalized selling) and aggregates industry as a whole. This study brings these topics together. Their relevance and benefits for the case company will be explored. This study thus creates a bridge between these topics, and at the same time applies the knowledge to the case company and the aggregates industry.

Table 1. Existing scientific material on the subject.

Keywords:	**Time horizon:**	**Database:**	**How many hits:**	**Theme:**
Customer value	2018-2024	Scopus	2064, but 46 in B2B context.	Creating value together with the customer, maintaining and strengthening the customer relationship, data-driven solutions.
Value-based selling	2018-2024	Scopus	38	The importance of implementation and proper communication. Its impact and practical challenges. How to support properly.
Guided selling (personal selling)	2018-2024	Scopus	142	Guided selling occurs infrequently, and as part of sales using digital tools. Personal selling emphasizes the impact on sales results and the approach to the personal selling experience.

Keywords:	Time horizon:	Database:	How many hits:	Theme:
Aggregates industry	2018-2024	Scopus	56	Sustainable development and environmental impacts.

The case company operates comprehensively in the aggregates business segment. Given the wide range of products and services produced by the company, and its operations around the globe, it is appropriate to narrow the scope of this aggregate to fit this study. In general, the aggregates sector includes activities for contractors and quarries of many sizes. Both of these can be considered in the study because the end products produced are broadly similar. Recycling activities will be examined in the study, but the focus will be on new aggregates products. Aggregates can be produced in fixed plants, or by mobile equipment. The focus of this study is on mobile devices, and the empirical phase of this study takes place in the mobile equipment research field. The study will also be delimited so that the main market to be studied is Finland. Data from Finland will be obtained directly from customers.

1.4 Structure of the study

This study consists of five sub-components. In the first chapter, the document begins with an introduction section, which gives the background to the study. This is followed by the research questions and the objectives of the study. In addition, the first chapter opens up the general body of scientific research on this topic. This is followed by the second chapter, which provides a comprehensive evaluation of the literature in this research framework. In practice, this means that the existing literature is reviewed in the context of this study. The literature review section is divided into three parts: understanding the customer value proposition, a study of different sales techniques, and a market review of aggregates products. At the end of that second section there is a summary of the theoretical framework for this study.

The third chapter contains an explanation of the research methodology. This section therefore provides a more detailed description of how and why this research has been

created as it is. This therefore also includes the information on the techniques used for data collection and analysis. The fourth chapter presents the results of the study, the analysis of the results and the use of the results. The final section will summarize the whole of this paper, as well as setting the stage for further research and analyzing how the knowledge gained from this study is limited.

2 Literature review

The purpose of this literature review is to address the context of the topic. This context includes customer value drivers, different selling tactics and overall aggregates industry. The literature review therefore delves into these topics, provides related terminology and examines the scientific literature on the subject. The main emphasis of the material used is on high quality academic material from recent years. This material is also supplemented by older material that is timeless and relevant to the subject matter and serve as general introductions to terminology. The literature review thus deals with customer value, different selling tactics and aggregates industry, each of which is further divided into subheadings to deepen the theoretical understanding.

2.1 The concept of customer value

Value is defined very broadly in the scientific literature. This study focuses on customer value as a component of value. Echchakoui (2018, pp. 138-149) defines value in business as consisting of three things: customer value, value creation and customer perceived value. Each has its own meaning, and all are important cornerstones for the success of a company. Customer value is based on the idea that the success of a product or service in the marketplace is primarily determined by the value it delivers to customers. It is important to understand and improve customer experience of value as it is key to achieving competitive advantage and long-term business success (Theoryhub, 2024). When you think about it, customer value is key to the success of the business as a whole, not just the success of a single product.

How customer value is created starts with the definition of customer value drivers. Customer value drivers are those things in products or services that customers appreciate. They can be both tangible and intangible. According to Mittal et al. (2014, pp. 46-54), companies should focus resources on improving inputs that affect the most important value-creating attributes, i.e. those that most strongly correlate with customer

perceptions, evaluations and behaviors. By investing in these customer value drivers, a company can significantly improve customer value, and thus, through customer behavior, the company's performance. Customer value drivers could be product performance and quality, cost efficiency or even customization and flexibility. There are numerous examples of this, many of them sector-specific. For example, safety may be a driver in the heavy machinery equipment sector, but in some sectors it is inevitably less important.

Customer value is very much linked to the company's vision of how they seek to increase this customer value, in practice what their customer value proposition is. Payne et al. (2017, pp. 467-489) define the customer value proposition as a tool to communicate the company's ability to share resources and offer a superior value package to targeted customers. So, in practice this is centrally related to customer value, because by developing this, the company develops the customer value it creates. In their study, Payne et al. (2017, pp. 467-489) identify the creation of customer value proposition as a task for both senior management and marketing and sales managers. According to the study, the roles should be divided so that top management takes responsibility for creating the value proposition at the firm level, which strengthens its link to the firm's strategy. Marketing and sales managers should assume responsibility for segment- and customer-level customer value propositions. Figure 1 shows the content of that study as a picture of a company's resources combined with its strategic decisions to create a competitive advantage.

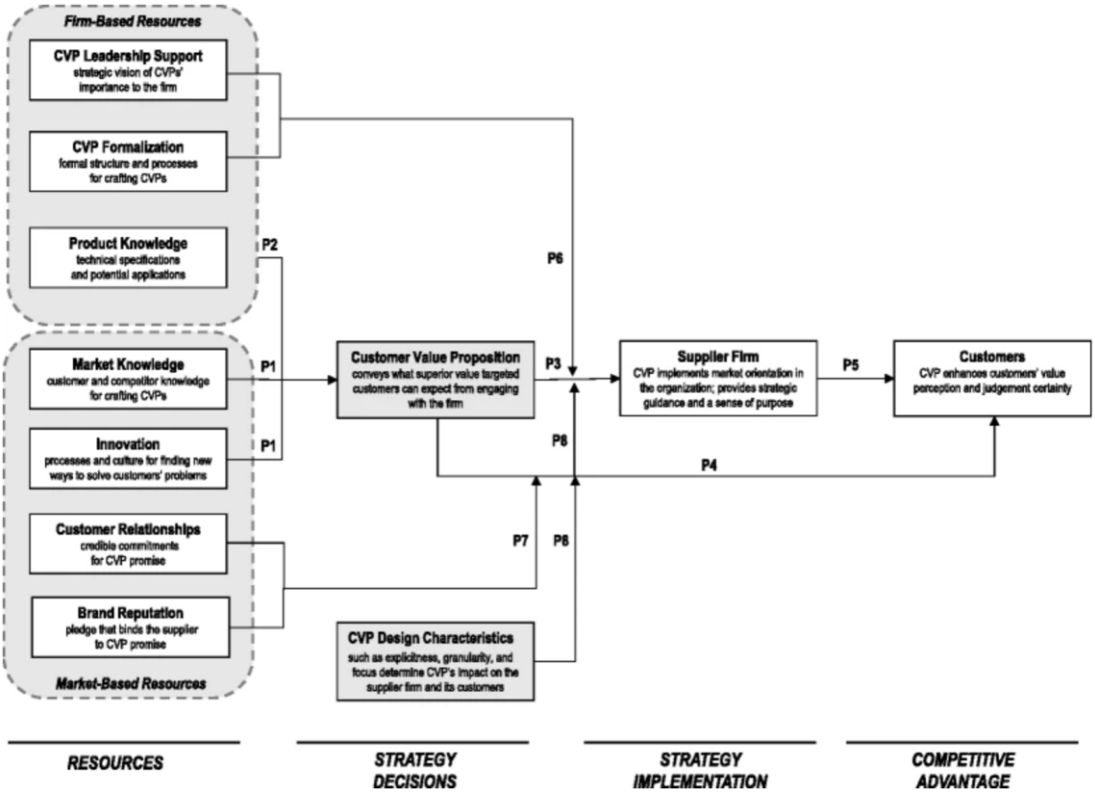


Figure 1. Antecedents and consequences of the customer value proposition (Payne et al., 2017)

Helmold (2020, pp. 71-77) defines the term value added as describing the improvement a firm makes to a product or service before the firm offers the product to its customers. This essentially means where, for example, a firm adds a value-adding feature to a product. This added value is at the heart of customer value, because by adding value to the product, it is very possible to increase customer value. This is a big responsibility for the company. The company must therefore create innovations that add value for the customer. Yen et al. (2020) state that innovativeness and customer engagement are critical components of customer value co-creation behaviors. They also say that innovativeness can increase customer engagement and promote customer value co-creation. This is good for companies to keep in mind, as customer engagement can lead to better customer satisfaction and more accurate customer value creation.

However, one challenging part of customer value is measuring it in concrete terms. To truly understand customer value, and to fully exploit it, it is also important to be able to

measure it effectively. Tong & Luo (2015, pp. 839-853) research looked at the factors that create customer value, and from these factors they obtained a numerical interpretation of which things in a given company create customer value. They created an evaluation method to identify the strengths and weaknesses of the different factors that contribute to customer value. This evaluation method involves customers rating different product attributes numerically, for example with a score of 1-5, and thus their importance in creating customer value can be identified. These researchers argue that this system will bring more reliability to the decision-making process of measuring customer value. This numerical ranking of attributes and issues could be used in many areas, for example in a situation such as a case company.

The customer value created can be measured in a few different ways. Once a company has enough information about the product requirements that drive customer value, it can start to innovate. When the innovation is close to release, the customer can be asked about their expectations of a potential new product or feature. Once the product is released and the customer has access to this newly developed feature, the company's ability to deliver customer value can be measured. Erikson et al. (2016, pp. 618-632) found this approach to be successful in their research. They were able to measure the customer value produced. Their idea can be applied in the same way as above to some of the big machine customers. So, in practice, this is done by measuring customer expectations and desires in relation to the response achieved in the product release.

One key area for delivering customer value is the customer's perceived value. As such, the customer's perceived value is not just the features of the product, but can be much more. It is the balance of benefits received versus sacrifices made. Sacrifices can be measured in terms of time, money or effort, for example. In the banking sector, it includes technology, professionalism, physical environment, emotional value, and social value (Suganthi & Muthulakshmi, 2022, pp. 439-453). Similarly, in clothing retailing, the value perceived by customers includes elements of practicality, social, and emotional aspects (Simova, 2009, pp. 88-97). High perceived value occurs when the benefits

significantly outweigh the sacrifices (Theoryhub, 2024). As Echchakoui (2018, pp. 138-149) demonstrates, customer perceived value has a direct link to corporate strategy, and strategy can be managed by knowing customer value. He also provides a tool to manage strategy by comparing it with the perceived value of competitors' customers.

Figure 2 illustrates customer value, and the concepts closely related to it. The diagram summarizes the ideas discussed in this literature review. It also aims to illustrate the link between the concepts explained. The central idea of customer value starts from the first ball, customer value drivers. Here are the things that the customer appreciates, i.e. what drives customer value. So they could be those related to product performance, safety or cost-effectiveness. As mentioned earlier, these can vary widely across sectors and types of business. In the next ball of the diagram comes the planning and communication of the creation of customer value, and the creation of customer value itself. This is therefore the phase of customer value creation that the company is doing. This creation work includes innovations and other solutions based on customer value drivers.

The last two balls in Figure 2 represent the customer value created, and the image of this value created for customers. These concepts as a whole can go hand in hand, but also from slightly different perspectives. What matters is the value created, and how the customer perceives that value in relation to the sacrifices he or she has made to achieve it. Together with the customer value created and the image created, the success of the genuinely created value can be measured. Ultimately, these all lead to the conclusion that the product or its features either meet or fail to meet customer expectations and customer value drivers. As this evolves over time, these can then be used to start this process again, forming new customer value drivers.

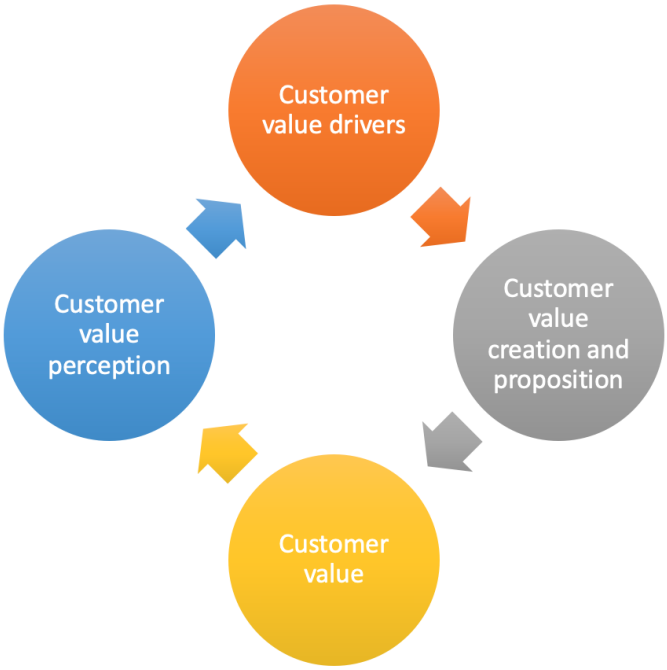


Figure 2. The value creation cycle (Adapted from Echchakoui 2018, pp. 138-149).

Customer value, its creation and its interpretation are therefore highly interlinked. When looking at customer value through the eyes of the firm, value creation is essential. Customers, on the other hand, see customer value in terms of the benefits they receive from products and services. Companies need to focus their value creation on what customers perceive as valuable (Martelo-Landroguez et al. 2014). Perceived customer value is a constantly changing entity that evolves over time. As a company shapes its products and services, the perceived value of those products and services may also change with it. Thus, it is important for companies to continuously examine the customer value and perceived value they create. Typical and practical ways of doing this are: customer satisfaction surveys with value-driven questions, NPS with value component or, for example, value-in-use analysis (Busacca et al. 2008). These practices can guide a company towards continuous improvement.

2.1.1 Role of customer value in B2B markets

At the heart of this paper are the market dynamics in the business-to-business (B2B) market. The case company in the study manufactures and supplies its equipment to customers who are themselves businesses. Such a business-to-business relationship is different from the usual business-to-customer relationship. This type of relationship emphasizes customer value, because B2B customers not only buy products or services, but also customer value itself (Mai & Liao, 2022, pp. 1389-1401). As Mai & Liao (2022, pp. 1389-1401) state, customer value is the key to winning customers and customer loyalty. This is a big reason why it is worth looking at customer value in general terms, but also in a business-to-business context.

As discussed in an earlier section of this literature review, customer value can be composed of many factors. Typically, it was found that customer value typically focuses on the immediate benefits and sacrifices of products and services, such as price and quality. One distinguishing factor between the creation of customer value in a business-to-business relationship and a business-to-customer relationship is that value creation between companies also involves many aspects of long-term relationships. In their study, Arslanagic-Kalajdzic & Zabkar (2017, pp. 47-58) stress that the reputation, reliability, and quality of the relationship between companies, and in particular between the selling company, are important factors in the creation of customer value between companies. It is important for businesses to bear this in mind, and to recognize the difference between customers and business customers.

Customer value co-creation has a significant impact on the relationship between the selling and buying companies. The impact of relationship quality on customer value co-creation is stronger in the relationship building and maturity phase (Cambra-Fierro et al. 2018). In their study, Sales-Vivo et al. (2021, pp. 941-957) used PLS-SEM strategies to measure relationship quality, and found that the effect of relationship quality on economic satisfaction is greater when value co-creation is introduced as a mediating variable.

What is common between private customers and business customers when it comes to customer value is that the selling company must be able to deliver quality value to both. Where that value comes from can vary between the two different entities. Almquist et al. (2018, pp. 5-6) have created a framework that helps companies identify what drives value in B2B markets. In this framework they name and classify 40 distinct kinds of value that B2B offerings provide customers. They have used the hierarchy of needs as inspiration and thus divided the value-adding elements into a pyramid with five levels. The most objective types of value are found at the bottom of the pyramid, and as you go higher, the values become more subjective and personal. A sample of this pyramid is shown in Figure 3 below. The pyramid as a whole is very comprehensive, and gives an idea of what drives value in business-to-business trade.

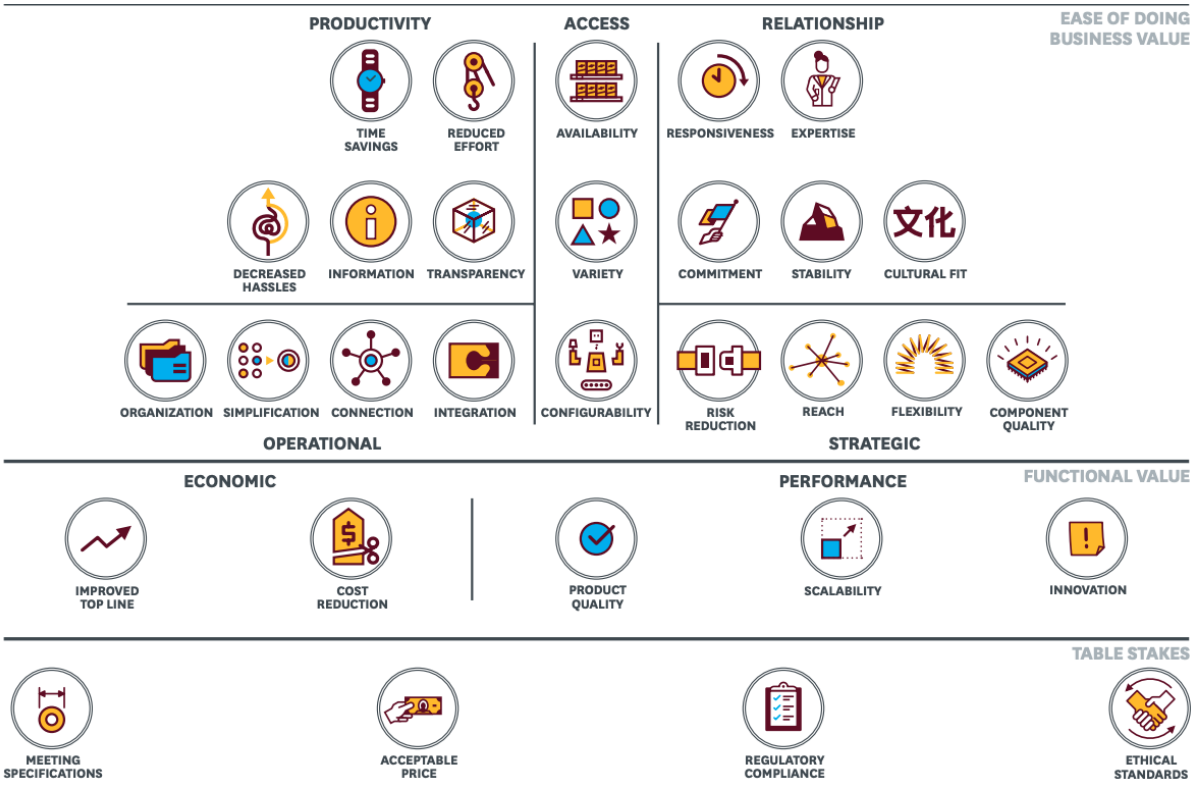


Figure 3. Sample of value drivers of B2B markets (Almquist et al. 2018)

As you go through the framework created by Almquist et al. (2018, pp. 5-6), piece by piece, you will notice a comprehensive breakdown between the different layers of the

pyramid. At the very bottom are the essential, entry-level elements that must be in place for a company to compete. If they are not met, the business cannot survive. This illustrates well the link to the hierarchy of needs, where this is the most critical element. Next come the functional elements, i.e. the core features that deliver practical and measurable value to the customer. These usually include, for example, operational needs such as cost reduction and revenue generation. At the next level of the pyramid are productivity, access and relationship, which facilitate the creation of shared value between companies. Overall, this figure 3 is very central to value creation, and especially between companies. The smaller spheres, such as configurability and reduced effort, are also key individual customer value drivers.

One of the key differences between business-to-customer and business-to-business is value co-creation. When a company sells products to a purely consumer customer, that customer can use the company's product until the end of the product's life cycle, however long that time may be. The key difference is therefore that in business-to-business trade, it is the buying company that seeks to create value for its customers with its products, so the success of the company is also very much dependent on the selling company. How this relates to customer value is key. In his research, Kahani (2019, pp. 1-4) concludes that in a B2B context, the pricing strategy would be better to be value-based, with an emphasis on understanding the value created by the end customer. Understanding the value creation of the end customer is therefore at the heart of this study, and this knowledge can be used in a similar way, for example, in a pricing strategy for a case company.

Joint value creation therefore benefits both companies, the selling and the buying company. One of the key issues in value creation between firms is the relationship between the firms. Firms want to keep paying customers so that they will possibly continue to buy the firm's products in the future. The importance of the business-to-business relationship is therefore a very key measure of customer value. In their study, Hochstein et al. (2023, pp. 912-932) state this as well, and identify three key issues that should be

monitored in relationships: relationship quality, product usage, and customer value realization. According to their model, it is the relationship between companies formed by products and services that is very important for achieving shared value creation and for retaining customers. It is these long-term relationships that are very central to the success and value creation of a company, and therefore relationships between companies must be actively managed.

2.1.2 Customer value drivers in the heavy equipment industry

Often in companies like the case company, the introduction and commercialization of new machines and innovations often requires extensive testing. Testing machines can be costly, as the cost of manufacturing machines can be very high, so it may not always be economically viable to produce more machines for testing. In order to be able to test machines of this type, it is necessary to have so-called pilot customers. Kirchberger et al. (2020, p. 353-374) find in their study that the key to acquiring pilot customers is to adopt a customer perspective, determine the monetary value and justify the value proposition. These are all integral to creating customer value. A better understanding of customer value can therefore also lead to more comprehensive test customer acquisition. Once the pilot customers are in place, it will be possible to collect comprehensive feedback from them, not only on the products, but also on customer value as a key element. When testing the machines, the company and the customer need to be in constant cooperation, so the development process involves the active engagement of both.

One of the key value drivers in the heavy machinery sector is simply product performance. In practice, it is how well a machine can perform, i.e. how well it performs its tasks. In the case company's case, it's basically how well the machine can make the rock smaller, and what is the quality of the crushed rock. Rauf et al. (2023, pp. 141-145) show in their study that performance is the most important value driver in the heavy equipment sector, even bigger than product price. Performance is also a key and well identified driver in the case company. One of the objectives of this study is to better

understand this performance metric, for example how the quality of crushed rock is a customer value driver.

In customer value in general, as well as in the deeper business-to-business environment, price is a key issue when considering customer value. The importance of price is underlined by the fact that customers may often consider the value of a product or service in relation to the sacrifices made. Often a key element of this sacrifice is the amount of money spent, which is the price of the product or service. Price is therefore an important customer value driver also in this sector (Rauf et al, 2023). The case company recognizes this, and sees the sale of machinery as a long-term investment. When talking about price, the added value of the machines must be highlighted. More importantly, this study wants to find out why price plays a key role as a value driver. Essentially, this is related to the revenue generation models of customers, and in particular to the demand and value of the final products.

Another important factor in customer retention and potential repurchase is the brand of the selling company. Ghanadiof (2021) have found a significant link between brand and repurchase as a result of their research. This is significant because the study was conducted in the heavy machinery sector. A brand as such can consist of many things, so it is important for a company to think about what kind of image they want to communicate to their customers. Quality was highlighted in the same study as an important factor in branding, as well as a significant customer value driver.

Quality is one of the major value drivers in this sector. Quality can come from many things, such as the choice of reliable components, or even the global availability of the necessary spare parts and consumables. Ease and predictability of maintenance is also an important part of quality. Hivarekar et al. (2020, pp. 1-4) have developed a mathematical model to minimize costly maintenance costs in the heavy machinery sector. In addition, the quality driver is also being developed in the industry in a technology-driven

way, for example, Sommarberg et al. (2018, pp. 207-224) found the internet of things to bring product optimization, maintenance, energy efficiency, and safety improvements.

In the table 2 below are some collected relevant customer value drivers from the literature. In the first column for example performance and quality. In the second column of the table there are practical examples of what a key value driver can be in practice in an aggregates market, for example performance can mean the amount of end product produced in tonnes in an aggregates market. In the last column there is a so-called explanatory factor for value drivers. This means why the key customer value driver is important and how it could possibly be measured.

Table 2. Key customer value drivers in aggregates business (Adapted from Rauf et al, 2023: Ghanadiof 2021).

Key customer value drivers	**Practical examples**	**How practical examples could be measured**
Performance	Tons produced, end product quality	Understanding market demand for the end product, defining specific quality standards or performance benchmarks of the end product
Long-term investment	Machine price	Price analysis of the end product, analyzing pricing trends over time in target markets
Quality	Reliability in terms of uptime	Usability feedback, ease of maintenance, and customer satisfaction surveys on serviceability
Brand	Expertise in the manufacture of machinery, latest technology	Tracking the resale value of machines, upgradability needs based on customer demands

2.2 Approaches to machine selling in B2B markets

The key to success for any business is its ability to sell their products and services. All good innovations, and the ability to deliver customer value, ultimately revolves around how effectively successful sales communication is carried out. Dubinsky (1981, pp. 26-33) has found that sales consist of seven distinct stages. These stages are: locating and prospecting for customers, the pre-approach, the approach, the sales presentation, handling objections/sales resistance, the close and the post-sale follow-up. Although Dubinsky's work is decades old, it is still very widely used in sales literature. Kadić-Maglajlić (2021, pp. 109-134) et al. studied the differences between these stages in emerging markets, and found differences in terms of the activities, challenges, and issues salespeople face. Today, elements of long-term customer relationship management, or, as Kadić-Maglajlić suggests, the opportunities offered by digitalization, might be added to this seven-stage process. Digitalization plays a major role in the first part of these seven stages, especially in locating and approaching your customers. Either way, these stages are central to sales, and therefore important to understand.

A feature of today's business is that there are potential markets all over the world. Construction is taking place in a large part of the world, so that also means that construction materials are also needed there. The Aggregates market is therefore the entire globe. This makes the sale of aggregates machinery an international trade. In their study, Rutherford & Matthews (2023, pp. 11-12) emphasize that, as a specific feature of international sales in this industry, particular attention should be paid to the norms and practices of different organizations and cultures. For such a normal seven-step sales process, he gives special emphasis to these cultural, linguistic, and regional differences related to identifying and knowing the customer. In addition, the building of trust is emphasized in international sales.

In his research, Ingole (2023, pp. 1-3) studied sales in the machinery business, its current trends and the effective sales practices, key strategies and techniques used by successful companies. The study highlighted four key recommendations that would be wise for a

company to apply. First, the company should prioritize a customer-centric approach, which in practice means better understanding of customer needs and requirements. Second, the study found that companies should embrace digital transformation, meaning strengthening digital technologies and online sales channels. Such digital solutions therefore enable more successful sales. The final recommendation of the study calls for more investment in distributor cooperation, and more investment in training and skill development for salespeople and employees. All in all, it can be said that this study by Ingole confirms the need for this master's thesis.

2.2.1 Value selling in B2B markets

Value selling is one of the tactics used by a company to promote sales. Value selling or value-based selling is basically trying to sell the previously described customer value you have created. Often, the market may focus too much on the price of a product or service, but value-added selling seeks to sell the intrinsic value of the product. The idea is therefore to compete on the value created by the product, rather than on the price of the product. Terho et al. (2012, pp. 174-185) have identified three key dimensions of value-based selling. These dimensions are understanding the customer business model, creating value proposition, and communicating customer value. These act as key building blocks when a company wants to move from price-focused selling to product value-focused selling.

So, the first is understanding the customer business model. The key here is to understand what the customer's main revenue streams and major expenses are. This is central to the understanding of customer value discussed earlier. For value selling tactics to be used to their full potential, they need to be based on a comprehensive understanding of the current state and value of customers. The implementation of value selling also requires an understanding of the key theories involved. Keränen et al. (2023, pp. 55-68) have identified several key theories for implementing value selling. At the organizational level, these include agency theory, game theory, signaling theory and social exchange theory.

From the perspective of the individual seller, mental accounting, framing theory and equity theory. Understanding customer needs, and their general understanding of these theories, is a good starting point for successful value-based selling.

Earlier in this paper, it was observed that customer value is essentially about how a company manages to communicate the customer value it has created. This was called customer value propositions. Now, in the value selling approach, the emphasis is on understanding that value proposition, because that is what value-based selling is trying to communicate. In their study, Liu et al. (2023, pp. 395-418) stress that firms should invest in presenting and training value propositions in order to achieve competitive advantage through value-based selling. They argue that it is essential to do this in such a way that the company's salespeople themselves have the necessary skills to deliver this message using value-based tools.

The key is how to translate customer value proposition into sales tactics, and thus into hard sales figures. The figure 4 below shows the central core of the Keränen et al. (2021, pp. 64-70) study. In their study, they have identified three different ways of selling value in the B2B market. These three ways of selling are product-centric, customer process-centric and performance-centric view. These all have a focus on selling value, rather than price as the central focus. How these tactics differ from each other, and from traditional price-centric selling, is shown in the different columns of the table. The researchers stress that different companies should choose the tactics that suit them, as different tactics are better suited to one company than another, based on their strengths and weaknesses. In addition, depending on the product or a particular customer, a combination of these tactics may be used. Each tactic has its own place of application, and each tactic has its challenges. This is why customer knowledge and product/service knowledge are very important.

	PRICE-CENTRIC SELLING	VALUE-BASED SELLING		
		PRODUCT-CENTRIC VIEW	CUSTOMER PROCESS-CENTRIC VIEW	PERFORMANCE-CENTRIC VIEW
Sales Focus	Sell products that meet customer-specified needs	Sell benefits instead of product features	Sell process improvements instead of product improvements	Sell realized performance outcomes instead of potential value
Value Focus	Estimated value in use not explicitly expressed	Estimated value in use of the offering	Estimated value in use of the process improvements	Realized value in use in the customer processes
Pricing Logic	Cost-/competition-based	Premium pricing based on estimated value in use	Premium pricing based on estimated value in use	Premium pricing based on realized value in use
Seller Role	Providing resources for customer value creation	Providing optimized resources for customer value creation	Facilitating customer's value creation processes	Taking responsibility and bearing the risk for customer's value creation processes
Customer Role	Fully responsible for value creation	Responsible for value creation	Cocreate value with selling party	Cocreate value with selling party
Customer Adaptations	None	Minimal product-usage adaptations	Process adaptations	Governance and business-process adaptations
Suitable Buying Approach	Price-focused product buying	Total cost focus in buying	Long-term business value in buying	Long-term business value in buying
Key Requirements	Cost advantage	Product excellence and value communication	Process expertise and value facilitation	Performance optimization and value realization
Key Challenge	Commoditization	Product imitation	Continuous improvement and contract renewal	Risk assessment and variable control

Figure 4. Three ways to sell value in B2B markets (Keränen et al., 2021)

Liu et al. (2023, pp. 395-418) found in their study that value-based selling improves sales performance for salespeople more than established sales methods. At the same time, they conclude that while the results are correct and promising in this regard, salespeople need the right kind of support to sell and adopt value-based selling. They say that salespeople also need to be willing to learn and preferably have extensive people networks. One essential form of support they found is that the company must support this learning, for example in terms of product knowledge. Orientation, and communicating the company's value selling strategy to salespeople, is an essential part of implementing value-based selling. In their research, they also found that value-based selling capabilities become more pronounced when customer needs are more complex or when competition between firms is fierce. This is very much the case in the aggregates market, where competition is much more intense, and customers are more demanding.

A very important feature of value-based selling is that it does not focus on the actual price of the product, but continues to look at the monetary value, but only at the value that the product or service delivers. The key is to convert the value of the product into

money. In the B2B market, customers are generally interested in making money. The idea of value-based selling is to communicate the value proposition of the company in such a way that the product makes money or saves on costs. So, a practical example might be how a particular feature of a rock crusher device brings increased efficiency or reliability, and how that efficiency translates into higher volume, and therefore more money made at the end of the day.

Research by Alnakhli et al. shows (2021, pp. 347-367) that adaptive selling, listening, and communication of salespeople positively impact the behaviors of salespeople to co-create value with customers. This helps sales performance. Practical ways to develop salespeople include role-playing, case studies, and using data to identify different customer personas. With these exercises, along with hard practice, salespeople will be better able to communicate their value proposition. The development of value selling can also potentially be practiced with the company's guided selling tools, where the technology created guides the customer towards a sale. Salespeople themselves can pick up from this tactic the things they use in their sales work. These tools provide a customer-centric sales approach, as in a guided selling tool the customer could, for example, choose the type of rock or the desired end product.

However, implementing value-based selling has its own challenges. Terho et al. (2017, 42-55) point out that value-based selling is not suitable for all sectors, as customer assumptions can be very different. For example, in pharmaceutical sales or health care, value-based selling can be challenging because customers already have a certain level of expectations, and value-creation can also be very moderate for customers. However, it should be noted that in the aggregates market, especially due to their B2B nature, this is not a challenge in implementing value-based selling. Terho et al. (2017, 42-55) note that in the sectors where this works, a common challenge may be the support, training, and material that individual salespeople receive. They also stress that management should invest at the organizational level in value assessment tools and customer reference materials.

2.2.2 Guided selling and digital tools in B2B markets

As mentioned earlier, the creation and development of digital tools can enable you to achieve better sales results. In their study, Fraccastoro et al. (2021) found multiple benefits when digital sales communication tools are integrated into the B2B sales process. They found that the integrated use of sales communication tools helps, among other things, to improve a company's sales performance by geographical distance and type of customer relationship. In addition, they say that it also benefits companies by enabling them to move quickly through the different stages of the sales process and adapt to the specific needs of their customers. These are just a few examples of the use of digital tools in sales, the benefits can be numerous.

The development of digital sales tools is an important part of today's sales work. Sales is also evolving from product-centric sales to more solution-based sales. At the heart of solution-based selling is a shift from selling individual products to thinking about how a company's sales force solves customers' problems. In the aggregates market, and hence in a case study company, solution selling focuses on the total solution from breaking down the big rocks to manufacturing the finished product. This could enable the sale of more machines at once. Solution-selling and its implementation has recently been studied more and more, for example Salonen et al. (2021, pp. 139-163) state in their study that successful solution-selling is centrally linked to successful value-based selling.

Solution selling is therefore very important, and strongly linked to both digitalization of sales and value-based selling. Guenzi & Nijssen (2023, pp. 745-770) have explored the implementation of solution selling in combination with digital tools and value-based selling. The results of their study show that the motivation to implement digital solution selling is key to the implementation of value-based selling. They emphasize that, together with salespeople, companies can transform individual customer needs into economic value, which can be expressed through a properly configured digital sales tool. In

addition, digital solution selling, and its development is key to implementing successful value-based selling. These researchers emphasize that to be successful in digital solution selling and value-based selling, customer needs must be identified and configured into a digital solution that delivers the right value proposition and demonstrates that it drives the business and therefore the bottom line.

One possible sales strategy is to focus on customer-centric selling, which in practice could mean tailoring sales to consider the individual needs and wants of each customer. This so-called personal selling has been found to have a positive impact on sales performance (Yi et al. 2021). Also, this adaptive selling, where salespeople tailor their approach to individual customers, enhances customer satisfaction and future interactions (Roman & Iacobucci, 2010). With this in mind, it is therefore inevitable to consider personalized selling using digital tools. This personalized approach helps to meet the needs of the customer in question. Using digital tools for personalized sales could allow this concept to be replicated, i.e., in practice, customers would receive a sales solution that works for them, but the company would not have to customize a completely different option for each customer but would have to categorize customers into groups. In other words, digital tools could be made to guide different customers to a solution that is specific to them, thus allowing for effective scalability in sales transactions that are personalized to the customer.

Combining these topics under this sub-heading gives a comprehensive description of what guided selling is. The main idea of guided selling is that the seller helps the customer to make informed purchasing decisions by guiding them through the selection process. Typically, this involves data-driven insights, product recommendations, and interactive tools. For example, in the aggregates market this could work well, as knowledge of the requirements of the process, and the desired outcomes, are complex and require a great deal of understanding of the different opportunities and customer needs. Guided selling benefits include tailoring the offering to the unique needs of each customer and efficiency, as it speeds up the sales process and the customer decision-making process.

The results of the McKinsey & Company (2021) survey show that 71% of customers expect companies to offer personalized solutions. According to the same survey, more than three quarters of consumers felt that receiving personalized communications was a key factor in making them consider a brand. While as such the aggregates market is not a typical consumer market where products are bought often and by many, such a large result could certainly have application to this sector, and to this case company. Furthermore, the study finds that personalization can also accelerate turnover even for companies that do not usually have direct contact with customers. This is essential for the aggregates sector, as customers often make decisions on their own, or together with distributors.

Although the actual sales may be made through direct sales or distributors, customers do a lot of the background work for the purchase themselves. Potential customers spend 27% of their buying time researching independently online (Gartener L2). This underlines the fact that while sales efforts should also be made in face-to-face encounters, it is very important to maintain relevant and correct information available on the company's website. Where B2B manufacturing companies should develop their websites is clear. Areas for improvement include site navigation, digital merchandising, and tactical guided selling support (Gartener L2). Companies should therefore see guided selling as an opportunity to develop sales even without direct customer contact. These potential guided selling tools could be used online, so that salespeople could also use them to support their sales.

To make guided selling as effective as possible, it is good to keep in mind the key steps for a successful implementation. Highspot (2024) has identified these key steps: everything starts with understanding the customer's needs and starting the conversation. This is followed by recommending the right products and helping the customer to make informed decisions. Finally, closing the deal, in practice, for example, directing the customer to the shopping cart or checkout. According to them, there are significant best

practices in guided selling. The key is to maintain a data-driven approach and sales readiness. In addition, they recommend providing educational content about the products and services, but in a way that keeps the sale moving along. It is essential that sales and marketing strategies are aligned, and that guided selling is constantly evolving with industry needs (Highspot, 2024). In order to maintain the individual needs of the customer at these stages, it is important to keep customer data analytics up to date so that customers receive targeted recommendations. As guided selling is very value focused, it is an excellent place to combine this with value-based selling methods.

2.3 The production and markets of aggregates

As stated earlier in this paper, supported by many studies, understanding the drivers of customer value and a deeper understanding of the customer business model is very important to drive sales. This section focuses more on the aggregates market, the sub-sector to which the case company belongs. This section provides the theoretical basis for understanding the aggregates business segment. Understanding this theory is important because it allows for a deeper search for customer information. This section discusses the production of aggregates, the general market for aggregates and related standards. This will help to gain a deeper understanding of this sector, and a better understanding of the customer values that drive customers.

2.3.1 Processes to produce aggregates products

The production of aggregates end products is a multi-stage process. The process starts with the mining of aggregates or the blasting of rock. If necessary, the aggregate is further reduced to a finer size before it can be placed in the actual rock crushers. Rock crushers crush the rocks to make them even smaller. Typically, rock crushers are fed by excavators or wheel loaders. The machines crush the rock, after which the machine in question transports the crushed rock to a possible next-stage machine, or possibly a

product pile. The crushing process can be single-stage, meaning that it involves only one crusher, but typically several rock crushing machines are used to obtain the appropriate end product. Crushed rock is produced from three main rock types, they are igneous, sedimentary and metamorphic (MPA, 2024). Typical types of crushed rock include granite, basalt, limestone and quartzites.

Four different types of machines are typically used for rock crushing. Not all machines are necessarily used to produce certain end products. The machines may be used in series in a chain, in practice with the previous machine feeding the next machine. These machines are jaw crushers, cone crushers, impactor crushers and screens. Each machine has its own purpose and is used in different ways on different sites. Jaw crushers are typically a front-end machine, while finer and higher quality material is obtained from a rear-end cone crusher. Impactors are well suited to recycling crushing.

In order for aggregates producers to produce the desired end product, they must select the machine configuration and settings so that the end result matches the desired quality and size. The number of crushing cycles, as well as the right amount of screening, are essential factors in this. Screening can take place on separate machines, or on parts attached to the machines that screen. What is essential in screening, therefore, is that the larger rocks are separated from the smaller ones. In addition to screening, rock can be treated by water-screening and air-drying. These methods result in a cleaner, less dusty product. When used as a decorative rock, for example, water-screening has cosmetic benefits.

Research shows that different crushing technologies produce aggregates with distinct geometrical characteristics, which in turn influence their performance in construction projects. For instance, Duchnowska et al. (2020) found that basalt aggregates processed with certain crushing methods exhibit better angularity and size distribution, crucial factors for high-quality end products. In addition to angularity and size distribution, the shape and surface texture of the aggregate are essential factors affecting the quality of

the final product. As presented by Kamani & Ajalloeian (2020), different rock crushers produce aggregates with varying sphericity and surface roughness, which in turn affects their suitability for construction applications. In their study, the key characteristics of the products are also form/shape, surface texture, flakiness, elongation and also sphericity. A rock can therefore have many properties that influence how it is used. For example, the ease with which water can pass through the rock is also a key factor when making drainage systems. When paving streets with rock to prevent skidding, the rock must be such that it does not slip under the shoe.

In their study, Bhadani et al. (2020) examined the key performance indicators (KPIs) in the aggregates production process. They identified these by applying the ISO 22400 standard, and they can be found in Figure 5 below. These are therefore essential performance indicators related to the production process itself, also in a sense aggregates sector customer value drivers. The fact that in the production process these developments have been taken by machine manufacturers have largely come from various developments in automation and the development of various sensor technologies. For example, sensors can be developed for optimal feeding (Itävuo et. al, 2017, pp. 82-95). Automation has also been developed to improve the whole production process, so that the optimal feed rate is kept constant, by slowing down and speeding up the various machines in the production line.

Measurement basis	KPI
Planned and real-time	Equipment utilization
	Equipment availability
	Process availability
Logistical quantities and quality	Throughput rate
	Equipment effectiveness
	Process effectiveness
	Yield of product
	Quality ratio
Power consumption	Specific power
	Direct power effectiveness
Overall performance	Overall equipment effectiveness index
	Overall process effectiveness index

Figure 5. List of KPIs for measurement of performance in an aggregates production process. (Bhadani et al. 2020).

2.3.2 Markets of aggregates products

Aggregates products are essential in the modern world. In Europe alone, the European (EU27 + EFTA, 2021) aggregates demand is 3 billion tonnes per year, representing an annual turnover estimated at up to €20 billion (UEPG Aggregates Europe, 2024). In both monetary and quantitative terms, this is a big figure, so it has major implications for the economy. The amount of aggregates produced can vary from year to year because of the importance of construction in this sector, and as construction declines, so does the demand for aggregates and therefore the production.

Aggregates products can be used as such, or they can be used in combination with various binding elements. As end products, they can be used as railway ballast, armour stones and beach replenishment. Combined with other binding elements, these products can be used as ready mixed concrete (made of 80% aggregates), pre-cast concrete products, and asphalt products (made of 95% aggregates). The figure 6 below shows the

intermediate use of aggregates products. The graph shows that the vast majority (40%) of aggregates are used as such in building foundations. In addition, a quarter goes into the production of ready-mixed concrete. (UEPG Aggregates Europe, 2024).

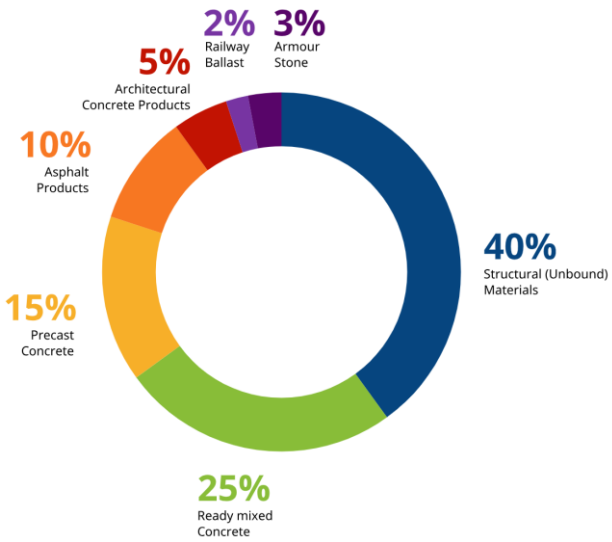


Figure 6. Intermediate use of aggregates products (UEPG Aggregates Europe, 2024).

The results of the UEPG Aggregates Europe (2024) study are shown below, highlighting the use of aggregates products as an end-use. Residential buildings are the main destination for these products, with 25% of aggregates material going into this sector. The next largest aggregates are transport 20% (Roads, Runways, Railways, Waterways), commercial buildings such as offices and factories 20% and social buildings such as hospitals and schools 20%.

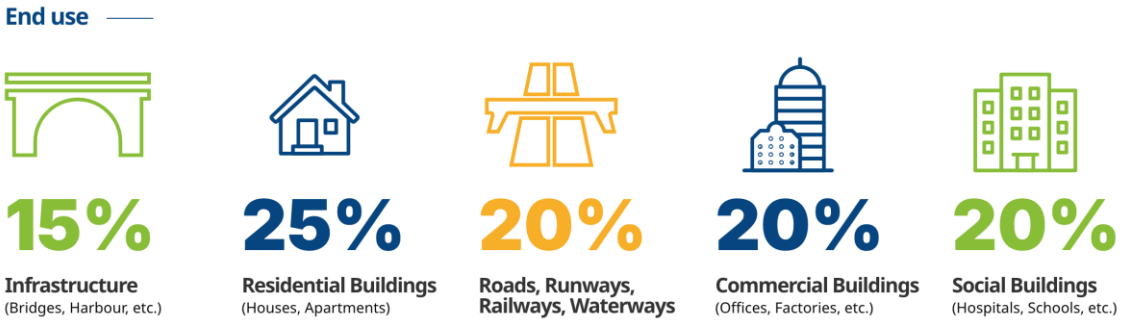


Figure 7. The end use of aggregates products (UEPG Aggregates Europe, 2024).

The practicalities of the aggregates market are crucially influenced by the type of contract the end customer is undertaking. The desired quality and quantity of rock is crucial. A variety of players can be picked out from the market to supply the final product to customers. One important supplier in Finland is Rudus, which supplies at least 25 different types of aggregates to its customers (Rudus, 2024). A typical feature of the market is that prices are not necessarily given directly to customers online. However, in a departure from this, for example, the Murske.net website, which supplies all over Finland, has a calculator where, for example, for Pirkanmaa, 1 cube of 0-8 mm rock crushed rock costs 19e (Murske.net, 2024). Typically, in the aggregates market, the desired material (e.g. crushed rock, sand or rock ash) and its size are specified in a range, e.g. 0-8, 8-16 or perhaps 32-64 mm.

2.3.3 Standards in aggregates industry

As we now understand, aggregates materials are very important for our society. They are used so extensively in the construction of our infrastructure, so their importance is great. However, in order for us to have confidence in the infrastructure we build, it must be of high quality. For example, for roads and building foundations to be strong, the aggregates used for them must be of high enough quality. In order to set such a quality standard, and for all aggregate material producers to meet that standard, standards are needed. As UEPG Aggregates Europe (2024) states, harmonized standards are essential for a free market and a level playing field for construction products. Standards provide general technical requirements, and thus a common set of tests to monitor and test standards.

The figure 8 below shows the standards listed by CEN (2024), the European Committee for Standardization, which are in use in the aggregates sector and are applicable to aggregates materials in this respect. These standards are therefore essential for aggregates producers, as well as for concrete and asphalt producers, for example. The standards for aggregates define the properties, testing, and compliance criteria for aggregates used in construction. For example, the standard EN 12620: Aggregates for Concrete, defines the

requirements for aggregates used in concrete. This standard includes, for example, requirements for aggregate in particle size distribution, shape, water absorption, and resistance to weathering. When this standard is followed, the aggregate will perform as expected. This can have an impact on the durability and drying time of concrete, for example.

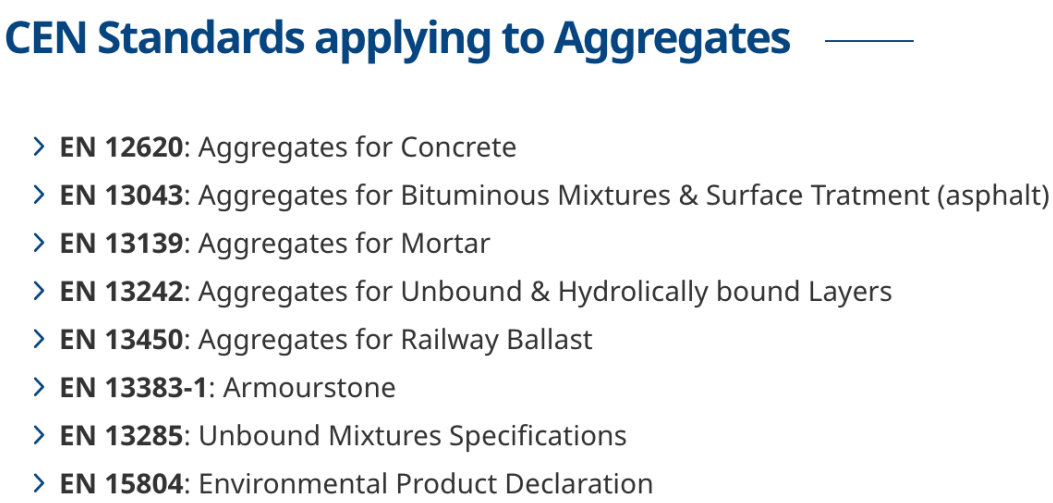


Figure 8. Cen Standards applying to Aggregates (UEPG Aggregates Europe, 2024)

Aggregates used in road construction must comply with European standards such as EN 12620 (for concrete) and EN 13043 (for bituminous mixtures) to ensure durability and performance under heavy loads. A study by Branco et al. (2019, pp. 803-815) evaluated aggregates in Portugal, confirming compliance with these CE marking standards through tests such as the Los Angeles and Micro-Deval tests for fragmentation and wear resistance. The EN 13043 standard sets requirements for products in terms of, for example, adhesion, durability and slip resistance of aggregates. Again, the properties of the aggregate, such as particle size, shape and water sensitivity, are considered. These standards underline the need for high quality in the aggregates market. Branco et al. (2019, pp. 803-815) highlight the crucial role of these standards in maintaining road safety and infrastructure longevity. In their study, they investigated the mechanical strength and weathering resistance of aggregate materials, and the filling of standards with these properties.

2.4 Summary of theoretical framework

This section summarizes and reflects on the issues discussed in the literature review. The literature review established a theoretical framework for customer value, value-based and guided selling tactics, and examined the aggregates market. In figure nine below, we can see the relationship between these key concepts. The link, in other words, lies in how and at what stages these concepts are related. The figure thus outlines the path from market demand to equipment sales. The concepts discussed are distinguished in the figure by different grey backgrounds. The headings of these grey entities are aggregates market, customer value and machine selling. Within these grey spheres is the topic discussed, broken down into smaller spheres, with interdependencies indicated by arrows. Within these smaller spheres, the darker colors represent the main issues of this study.

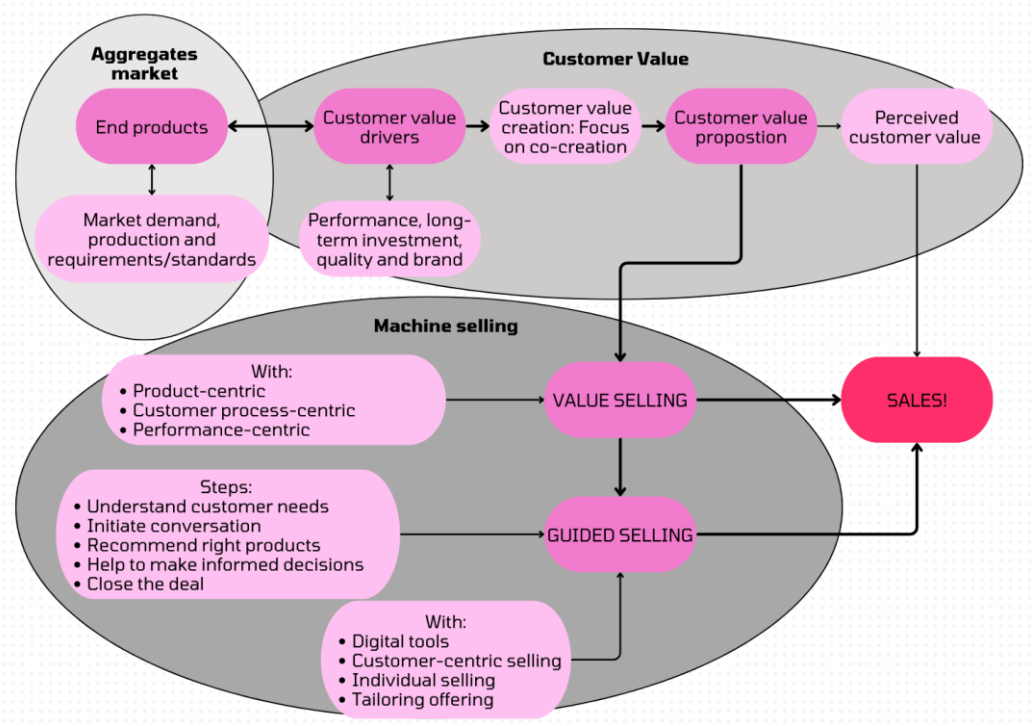


Figure 9. Overview of customer value, sales strategies, and aggregates market dynamics.

The literature generally highlighted the importance of understanding customer values. Understanding customer value creates a competitive advantage for a company that can leverage this knowledge to great effect. The literature identified four different components of customer value: customer value drivers, customer value creation, customer value proposition and perceived customer value. One of the most important entities related to customer value are the customer value drivers. These were discussed in the literature in different ways, highlighting the characteristics that are most specific to different sectors. Those drivers that strongly drive customer value are at the heart of a successful business.

The literature highlighted the strong global demand for aggregates products, and the different methods of manufacturing these products. In addition, the literature helped to identify some of the essential quality requirements that may be demanded of these aggregates end products. For example, certain products must meet form/shape, surface texture, flakiness, elongation and also sphericity requirements. It was found from the literature that the different requirements of the final products depend very much on the application for which these products are used. For example, road construction has certain requirements which impose property requirements on the rock. In order to ensure fair competition for the production of rock and to guarantee the quality of construction, the manufacture of aggregates is governed by different quality standards. These standards were discussed in chapter 2.3.3.

The literature review provides a comprehensive foundation for the theory surrounding the topic. It provides a basis for understanding customer value in the B2B market, and in particular in the aggregates industry. In addition, the literature review provides a theoretical basis for selling machines. The literature highlighted the emerging role of guided selling, particularly in relation to the digitalization and personalization of sales processes. The empirical phase of this study is therefore based on this theoretical framework. It is essential to investigate how the customers of the case company perceive the different customer value drivers, as well as to gain insights into the final products of the customers.

This information can be used to develop the company's value selling and to create a basis for guided selling.

3 Methodology

This chapter presents the methodological procedure for the empirical part of the study. The chapter consists of three main parts. The first part deals with the research design, which reviews the methodological choices made in designing the study. The second part deals with the case company. Finally, the issues related to data collection are discussed, as well as the methods used to analyze the data obtained. This chapter provides a comprehensive description of what has been done in the empirical phase of the study and how these solutions have been arrived at.

3.1 Research design

This section describes the research design for the empirical phase of the study. The methodological choices used in the study will guide the progress of the research and serve as a basis for achieving the study's objectives. This section therefore focuses on the methodological choices made and how these choices were arrived at. The description of the choices made draws heavily on the research onion model of Saunders et al. (2019, p. 130). That research onion is applied to this study, and that application is summarized in figure 10 below.

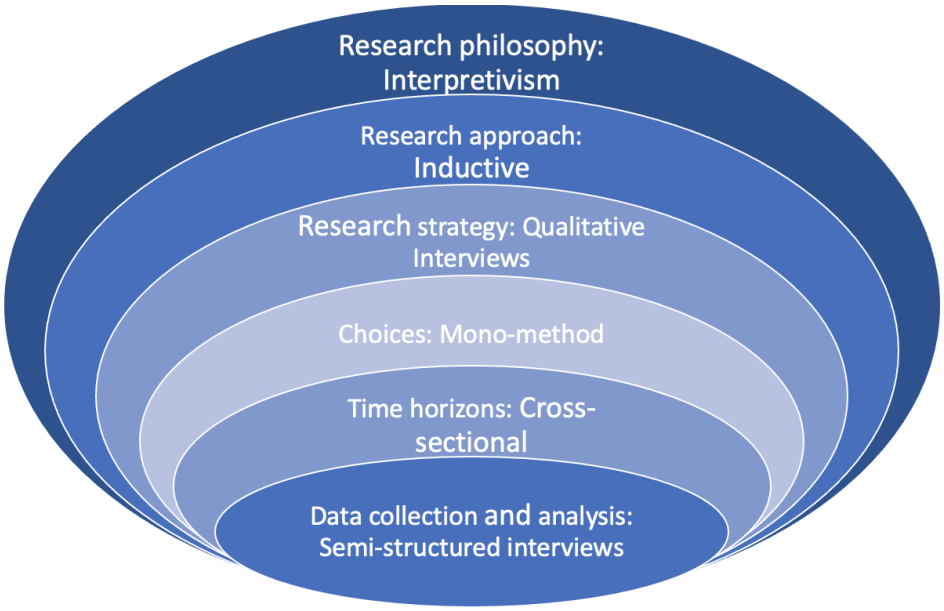


Figure 10. The research onion with the methodological choices made. (Adapted from Saunders et al., 2019, p. 100)

Research philosophy: Interpretivism

In this study, the research philosophy used is interpretivism. Saunders et al. (2019, p. 106-107) state that when using this approach, it is necessary to understand the differences between people as social actors. They also stress that the researcher should enter the social world of the subjects, and thereby understand their perspectives. It can therefore be said that this approach focuses on understanding subjective meanings and social phenomena. It recognizes that reality is constructed from the experiences, perceptions, and interactions of individuals. The reason why this is the right approach for this research is that it explores clients' perceptions of value, which vary according to individual experiences and contexts. Interpretivism supports qualitative methods and is also appropriate for this kind of context-specific research.

Research approach: Inductive

This research is inductive in nature. The research seeks to delve deeper into customer insights and identify patterns rather than test existing theories. This model fits this paper because it aims to uncover themes and develop understanding from the ground up. Induction is used to collect data and develop a theory as a result of data analysis (Saunders et al., 2019, p. 120-122). In practical terms, this means that the findings and data from the study could be used to move towards the introduction of value-based and guided selling.

Research methodology: Qualitative interviews

The approach used in this study is qualitative interviews. None of the Saunders et al. (2019, p. 132-134) research onion strategies are entirely appropriate for this study, semi-structured qualitative interviews are the most appropriate case study approach. The case study approach is essential for an in-depth exploration of a specific case, group, or context to understand complex phenomena. This is appropriate in that the focus on customer value in this particular context is the main focus. Case studies allow for a detailed,

context-specific exploration of phenomena. The possibilities are limited, for example, by the fact that there are so few customers in this sector that quantitative surveys, for example, are practically impossible.

Research method: Mono-method

The method used in this study is mono-method. It is a qualitative study, with the focus on this particular context. Mono-method is therefore appropriate because it allows gathering qualitative data to understand customer value drivers. It is also not necessary to carry out a quantitative study on this topic, so mono-method is therefore sufficient.

Time horizon: Cross-sectional

In this study, the time horizon is cross-sectional, as the aim is to look deeply into the drivers of customer value, rather than to observe changes in them. In practice, we are looking at the phenomenon at a specific moment, not over time.

3.2 Data collection and analysis

This section looks in more detail at the choices made in the study in relation to data collection and processing. As mentioned earlier, this study conducted semi-structured interviews with a selected target group. The target group and the interviews were limited to aggregates clients operating in Finland. The clients were selected from within Finland because they are more likely to be successfully reached and persuaded to be interviewed in the context of this study. It was considered unlikely that clients would agree to be interviewed remotely, and as the researcher was located in Finland, Finnish clients were the most natural choice for this research.

Individual interviewees were carefully selected from the existing case company clients available. Customers are therefore those who have bought a case company's machines at least once. The fact that the customers interviewed own these machines makes it possible to contact them. Even if they own the case company's machines, they may also

own competitors' machines. The machines they use wear out over time, so these interviewees are also potential customers in the future. The list of these Finnish customers was obtained from the senior sales manager of the case company. This person has therefore been in active contact with the customers in the past, so he provided the necessary contact information to contact the customers.

The theoretical number of potential clients to be interviewed, meaning the population of interviewees, is estimated to be around 20. Of these, 15 were realistic targets, selected due to feasibility and resource constraints. The actual sample for this study was selected using a combination of stratified sampling and purposive sampling. Stratified purposive sampling was used to ensure a balanced representation of customers from different regions of Finland. First, the total population was divided into four geographical strata: central, western, eastern, and southern Finland. This stratification ensured that the sample would reflect regional differences in market conditions. Within each region, specific customers were then purposively selected based on accessibility and willingness to participate. At the same time, care was taken to ensure that the relative share was maintained. The final selection consisted of 2 out of 4 customers from the south, 3 out of 5 from the west, 1 out of 1 from the east, and 2 out of 4 from the central region. In addition, one company was interviewed which is a larger player in Finland and therefore active in each of these geographical areas. This method ensured a comprehensive description of the aggregate’s businesses operating in Finland, while also acknowledging practical constraints such as travel limitations.

In qualitative research, data saturation occurs when no new themes or insights emerge from additional interviews. In this study, the sample size was 9 interviews supplemented by 4 distributor interviews, based on both practical constraints and data saturation point. The fact that the sample size was determined by data saturation allowed for a comprehensive view of the research topic. By interviewing 9 customers, it can be ensured that at least 40 percent of the population is covered, which is sufficient to obtain meaningful and representative data. Considering the limited availability of customers and the long

distances between locations, we can be very satisfied with the number of interviews conducted.

The interviews are semi-structured, meaning that the researcher has created interview questions, however, so that it is possible to explore unexpected topics that may arise. This approach ensures consistency while allowing for flexibility in responses. In addition to this, it is possible to ask for more detailed answers and reasons for the answers, in accordance with the nature of the interview. These responses are used to understand customer value drivers and to generate more detailed information that can be used in guided selling and value-based selling techniques. The interview questions, and the discussions around the interview with clients, aim to create a deeper understanding of how clients' businesses are formed and the challenges and opportunities they face. The structure of the interview and the questions created can be found in appendix 1.

The interview consists of twenty questions. Questions 1 to 4 are general information about the company's activities, 5 to 12 are related to aggregate production, and 13 to 20 are related to the choice of machinery. The first section provides basic information on the operational possibilities, e.g. number of employees and machines. In step two, the quality of the aggregates is essential. The last section is the selection of machinery, the purchase of machinery and the priorities of the characteristics of the machinery. All of these are aimed at better understanding which things create customer value in this market. In addition, which issues are emphasized in the selection and sale of machines. These questions will therefore be used to clarify the topics covered in the study, namely customer value, value selling, guided selling and general knowledge of the aggregates industry.

Fifteen questions are open questions, the rest are closed questions. One of these closed questions is a matrix question with a multiple-choice scale, where simply the respondent indicates the number of machines from the given options, with values from 0 to 5 or more. The fourth question is a proportional rating scale, where the respondent describes

the company's direct sales of aggregates in relation to its sales of crushing services. Here the options are 100%-0%, 75%-25%, 50%-50%, 25%-75% or 0%-100%. This gives a sufficiently accurate picture of the company's activities, and yet there may be variation within the company.

Question five is a Likert-type scale in a matrix format, where the options "not at all", "to a small extent", "to a moderate extent" and "to a large extent" are used by the respondent to describe the impact of the given options on product pricing. The options are things that are typically thought to affect pricing in this sector. Similarly, in question 7, the options "rarely", "sometimes", "often" and "always" are used by the respondent to answer the question on how often the given quality requirements are raised. The questions force you to think about relative importance. These two different questions also ask which other issues influence pricing or which other quality requirements are raised. The last question, question 20, is a ranking question using an ordinal scale. The purpose of this question is to find out which features of machines are most important compared to other features. In other words, the respondent ranks the ten given characteristics in order of importance. All features are desirable, so the question forces a comparative judgment among the options.

In addition to the interview questions, customers are asked to fill in a table on aggregates, asking about production priorities, production volumes, sales prices and relative quality. In that table, the different aggregate products are listed on the left, with the above information from left to right. In practice, the spreadsheet provides information on which end products the case company should use in its guided selling and value-based selling communication. As the literature review discovered, these tactics work best when combined with concrete numerical values, so it is possible to obtain these values using this table.

The interview materials were reviewed together with the relevant people from the case company. The purpose of this review was to ensure that customers were asked the right

questions, and in a format that would enable them to answer those questions. In particular, this helped to highlight the different types of clients that exist. For example, the review highlighted the need to distinguish between contract crushing and direct sales of aggregates. Contract crushing is where the customer sells the crushing as a service, and direct sales are where the crushed aggregates are sold. This was thought to have an impact on certain issues. A person from product management, two sales support people and the senior sales manager mentioned above participated in the review of the materials. They all had a broader understanding of Finnish customers.

These interviews themselves were conducted in the client's environment, meaning that the researcher travelled to the interviewee's site. Before the actual interviews took place, the client had been explained a little about the type of things that would be covered during the interview. The interview questions and a table of aggregate materials were then sent to the client by email. This enabled the customer to search for information on, for example, the quantities produced or sales prices, if necessary. The interviews were recorded so that the researcher could transcribe everything that emerged from the interviews, so that no information was lost.

In addition to the customer interviews, the study also conducted similar interviews with a few distributors. Distributors are those who buy machines from the case company and sell these machines to end-users. The use of distributors varies from country to country and continent to continent. By interviewing distributors, it is possible to gain a broader understanding of the issues at stake. In particular, the interviews with customers on the purchase of machines were somewhat limited, so interviewing distributors allowed to gain more insight into the different markets on this topic. The study sought to include distributors from Germany, the United Kingdom, Sweden and France. Naturally, distributors are not able to provide such a comprehensive picture of the production of final products, but their active involvement at the customer interface helps to build up a picture of customer activity.

A thematic analysis technique was used to analyze the data collected through the interviews. In the analysis, the researcher gathers the qualitative data and looks for emerging themes and relationships. These themes are centrally linked to the objectives of the study. Thus, the themes of the interviews are demand and price for the end products, as well as their quality requirements. In addition, the choice of machinery and the root causes of these decisions are also a central theme. These themes are used to extract the essential customer value drivers from the interviews, and thus to understand customer decision-making.

4 Results

This section reviews the results of the responses collected and highlights the themes that emerged in general. This section will therefore review the responses of the surveyed respondents to the questions provided. This results section is divided into five different sub-sections. The first section gives a general description of the clients interviewed and their context. Section 4.2 then deals with issues related to the production and sale of aggregates products, followed by Section 4.3, which deals with issues affecting the choice of machinery. This is followed by a section which gathers the findings from the interviews with distributors. In the final section, all these sections are summarized.

4.1 Overview of interviewees

In the end, a total of nine customer interviews were conducted. This number achieved data saturation, and the overall picture of the views of customers operating in Finland was deemed appropriate. Customers were interviewed in different parts of Finland to consider local variations. In addition, geographic location can have a slight impact on aggregate requirements. Naturally, the competitive situation is also different in different parts of the country, so this may also have had an impact on customer behavior in the market.

In addition to customer interviews, the study also included interviews with distributors of the case company. The distributors buy the case company's machines, and sell and rent them to the users of the machines. In addition, the distributors may also be involved in the second-hand machinery trade, facilitating the resale of the customers' machines. With these elements, the distributors are therefore very much part of the customer interface, both in buying and selling machines. Their insights can be used to broaden the understanding of the customer interviews conducted in Finland in a global market context. Even though distributors do not play a similar role to Finnish customers, they are nevertheless close to the customers in each region, and thus can provide additional

insight. In total, distributors from four countries were interviewed. The distributors interviewed in this study are based in Germany, Belgium, Sweden, and the United Kingdom. In these countries, these distributors are key players in the sale of case company machines.

As distributors do indeed play different roles in relation to customers, it is to be expected that views may be slightly different. All interviewees, whether customer or distributor, were asked exactly the same questions. As the interview was mainly aimed at customers, not all distributors had exactly the same knowledge of the customer's business. Distributors were asked to consider the interview questions as if they were stepping into their customers' shoes and thus trying to answer as their customers would. Because their customers are varied, similarly to what was said earlier about Finnish customers, distributors try to create a complete picture of the typical customer. To facilitate the distributor's response, they were given the option to focus on one customer or one type of customer.

The interviews started with a basic survey of the client. These first questions gave an idea of the size of the company, and thus its capacity to produce aggregates products. The size of the company was indicated, for example, by the number of employees involved in rock crushing. The number of employees ranged from 3-80, both in terms of the workload and the size of the company's operations. For example, some use their own equipment, like trucks, to drive products, while others outsource. Some, on the other hand, have several crushing projects going on at the same time, meaning that there may be workers on several different sites at the same time. However, it can be generalized that to run a typical crushing operation, companies need at least three people. With three people on the job, each person has a good number of tasks to do, but with breaks and so on that can be arranged for the workers.

When you look at customers' machines, there are differences and similarities. Typical machine combinations included one jaw crusher, two cone crushers and one or more mobile screens. If the customer was larger, this pattern could be multiplied. Three of the

customers had an impactor and used it for recycling crushing. Later in this paper, when interpreting the different answers to the questions, it is useful to consider the recycling crushing feature as it is slightly different from conventional crushing. In addition, one of the customers had a fixed plant, i.e. with fixed crushers and conveyors. This plant is supported by mobile screens and a vertical shaft impact crusher. This fixed plant also has an impact on the answers to the questions asked later.

Similarly, the form of income generation of the enterprise also plays a role in the responses. It may consist of direct sales of aggregates to the consumer, or alternatively, whether the client engages in crushing contracting, where they sell crushing as a service to landowners. The option could therefore be either of these, or a combination of both. Two customers made only direct sales, two made 75% direct sales, two made 50/50 direct sales, one made 25% direct sales and two customers made only contracting sales. This was therefore very evenly split between the different options. The impact of this on the explanation of the themes that follow will be discussed separately for each phenomenon. For many companies, this distribution varies slightly from year to year, but this breakdown into five different options allowed this effect to be minimized.

4.2 Decision-making in aggregates production

4.2.1 Pricing and cost factors

Perhaps the most essential element in running a business is the pricing of its products and services. One of the aims of these interviews was to find out what the pricing logic of customers is based on and what drives this decision making. The question asked what factors customers consider when setting prices for aggregates products. In addition, this question provided the most common options that the customer had to evaluate the impact of the characteristic in question on the overall pricing. These pricing effects and their relative amounts are shown in the table below.

Table 3. Impact on pricing of aggregates products.

	Not at all	To a small extent	To a moderate extent	To a large extent
Transport			6	2
Quantity		1	3	4
Competitor price		2	3	3
Contract deadline	1	5	2	
Production cost		1	4	3

One of the biggest elements that affects the customer's pricing is transport. From the general discussion in the interviews, it can be seen that the importance of transport is different in the case of direct sales of aggregates or sales of crushing services. In direct sales, the costs of moving the finished products are highlighted, while in contract crushing, the costs of moving equipment are highlighted. In the case of direct sales of products, transport has the same effect as 'To a moderate extent', as shown in the table. This is explained by the fact that more operators have separate collection and transport price lists. When a customer considers his pricing, he considers the destination to which the aggregates material is to be delivered. The destination is important because of factors such as the distance to the destination, the difficulty of delivering the goods and the time it generally takes to transport the goods. The customer as such is therefore considering the opportunity cost, which is ultimately reflected in the price to the final customer. One respondent calculates the cost at €3 per kilometer, but this can be lower if the destination is good and the quantity to be delivered is large.

In the case of contract crushing, the role of transport in pricing is even greater. The role of transport is so important that more customers are considering submitting a bid and accepting a contract entirely in terms of how much it will cost to move the equipment there and whether it will make the contract worthwhile. If the site is remote, moving your own crushing equipment to the site is a very important factor in making it profitable. Thus, a nearby company may be more likely to win tenders. As an example of this, one customer stated that in a 10 000t crushing operation, if you add up the transport costs

of €5,000, the price will increase by 0.5e per ton of finished crushed rock. For this to be profitable the transfer would have to have an impact on the price of around 10-20 cents. This has led to a situation where smaller contracts are no longer being awarded, with the average contract now being 20 000-35 000t. Similarly, a 20 000t job is not reasonable if it is 400km away. So overall, either bigger contracts are wanted, or alternatively, smaller ones closer together are more desirable. If you get a bigger gig, it saves you a lot of money. When this is achieved, it is also reflected in pricing, as savings in transportation of machines are a major factor in the pricing of contract crushing. To illustrate this, if a 60t job requires one transport and three 20t jobs require three transports, the bigger one is significantly more profitable. Larger jobs are therefore cheaper for the end customer, but also more profitable for the aggregates manufacturer.

The pricing is thus heavily influenced by the cost of transport, and also by the quantity ordered because of transport. The emphasis on quantity in the table is therefore largely due to the transport of contract crushing. Customers prefer larger contracts anyway, because it creates certainty and stability for the future of the company. Because of this stability, customers are willing to be flexible on price. In direct sales, volume matters if you're talking about one truckload versus thousands of tons of aggregate. However, the rebate is reduced if we are talking about 5 000t versus 10 000t. Customer examples of volume discounts were 0-10% and 2-5%. In addition to quantity, other things affect this discount, such as if the destination is nearby.

Customers' opinions on the influence of market/competitors on the pricing of final products vary, and this is also reflected in Table 3. However, the interviews revealed that price is the most important factor in winning contracts/sales, so clients are aware that crushing work goes to whoever can do it cheapest. In this respect, the industry is so small that clients are well aware of their competitors and thus know how to price their contracts on a case-by-case basis. Market pricing was particularly important for larger companies, as the end customer is ultimately interested in price. The timetable, on the other hand, was perceived to have only a minor impact on pricing. In spring and summer there are

more contracts, so the price is slightly better. It used to be that you could get a contract crushing gig by getting to the site quickly, but nowadays the Centre for Economic Development, Transport and the Environment (ELY) takes so long to process permits that the scheduling benefits have almost disappeared.

The next thing that affects the pricing of the case company's customers is the cost of producing aggregates. It was estimated to have a moderate, or even a large, impact on the prices set. In particular, fluctuations in fuel prices are also reflected in the price of aggregates. The quality of the rock also increases the manufacturing cost, as harder rock is more expensive to crush, and this must also be reflected in the price. An example of this is a customer whose crushing sites are less than 30 km apart, but the price is 2-3 euros higher at another site for this reason. In addition, if the site itself is really muddy, the crushing becomes more challenging, and this is also reflected in higher prices. If, in contract crushing, the customer wants a constant variety of products, the price will have to be increased because of screening meshes and other adjustments. What is not driving up prices, however, is the wear and tear on machinery. The speed at which machines wear out in different products or plants is not, as such, capable of raising prices very much.

The issues that came up outside the given options were related to, for example, customer relations. Whether it is direct sales or contracting, the importance of customer relations is also reflected in pricing. A good customer can be sold to at a lower price, for example, years of experience can tell you that they order from you several times a year. The importance of customer relationships also brings money in the other direction, as a satisfied site owner will take on a contract crushing company they know and are happy with their service. When the industry is small, a good reputation is important. In addition, outside of the options given, permitting issues came up, meaning that if the city imposes strict conditions on crushing, these will be reflected in the prices. For example, if the city only allows eight hours of crushing a day, the price must be right to make the site profitable when you can only crush part of the day.

In terms of the type of client, whether private or public, there is a slight difference in pricing. The public side operates through open tendering, and this tender often already contains detailed information on the requirements and payment conditions. In addition, the public side already has a clear idea of what it will pay for the aggregate. Of course, the public side gives you certainty of payment, the money comes as agreed and on time. For public sector and infrastructure contractors, aggregates may be sold at a slightly lower price because the quantities are larger, and the sites are easier. On the public side, prices are negotiated through public tenders and are usually completed in one round. The private side may take longer to negotiate the price. But in the big picture, haggling is less common. On the private side, the customer relationship also affects the payment terms. An unfamiliar customer is sent an invoice more urgently, so that the machines can be brought to a standstill more quickly if necessary. The general norm is 14 days payment terms. The bigger the construction company, the more they may ask for a longer payment period. For cities and infrastructure contractors, the payment term may be 30 days. There is a growing trend to ask for payment terms, up to 45-90 days is being asked for, but that has not been agreed to by the aggregate's crushers.

A key element of pricing, and of the whole business, is the cost of production. The most typical items affecting costs were fuel, screen mesh, and wear parts. Obviously, the smaller the rocks needs to be crushed, the more energy it takes, and therefore it is more expensive. Some expect to save significantly on production costs by manufacturing with electricity. With larger products, the screen mesh wears out faster, and breaking the rock into smaller pieces consumes more wear parts. For example, 0-56 was estimated to be more expensive to make than 0-32 because the screen meshes wear out faster. In addition, some customers are investing more in extraction, as it helps to reduce the amount of material that needs to be crushed in the first place. Perhaps the most important factors that customers can in turn influence production costs are: Predictive maintenance of machines, possible choice of diesel-electric or electricity from the grid, and training

of machine operators. Skilled operators are able to keep the machine full, which improves both costs and the quality of the end product.

In general, measuring the profitability of products was found to be somewhat challenging, but important. Perhaps overall, there is not a huge difference in profitability between products. Even if smaller products cost more to make, this cost can be driven into the selling price. Estimating profitability is challenging because, for example, it is difficult to translate working hours spent per product. So, the cost of manufacturing, and hence the profitability of products, is the sum of many factors. These cost factors are the ones that customers try to estimate as best they can, and on that basis also consider pricing. However, in contracting, needs may change in the course of the work, but the price does not. This necessarily leads to a significant change in the profitability calculations. Profitability is also challenging because the manufacture of certain products creates a by-product that is harder to sell, so the main product is not so profitable in that sense because it reduces the total tonnage that can be sold.

In general, the profitability of larger products such as 0-56 and 0-90 is lower. They are cheaper to produce, but correspondingly the selling prices are not so high. The interviews suggest that the larger products are volume products that can cover fixed costs. Smaller screened products, on the other hand, and aggregates for concrete and asphalt, are slightly more profitable, but demand is also much lower. So both products are needed because without higher volume it is difficult to get regular cash flow, and better returns are obtained from higher quality products.

4.2.2 Quality expectations

One of the themes of this study was to investigate the importance of the quality of crushed aggregates for the case company's customers and for the end users of aggregates products. The aim was to find out how big of a driver quality is, what the quality requirements are and how quality affects pricing. These issues will help to understand how quality should or should not be considered in value selling or guided selling, for

example. The study therefore looked at the most common quality requirements, how to achieve them, standards, the impact of quality on pricing and the choice of machinery.

The table below shows respondents' answers to a question listing the most common qualitative characteristics, asking them to select the frequency of qualitative characteristics on a scale of rarely-sometimes-often-always. The table shows that respondents were almost unanimous that gradation is the most frequently asked material quality criterion for aggregates. This was also confirmed by the interview discussions. Gradation is the first thing you talk about when you talk about quality. Gradation patterns are needed for all types of customers. For construction, whether it's a single-family home or a municipal project, gradation patterns are required by law. For roads, the gradation is as needed, as for the muddiest bottoms, the gradation is intended to be such that the distribution is more dominated by coarse rocks. Similarly, for hard surfaces, a powderier distribution is desired, as it is not desirable for rocks to run off the road. When it comes to gradation, however, end-users know what they want, and know how to demand it. So even if customers don't ask for it, you still have to pay close attention to the gradation.

Table 4. Frequency of quality requirements in aggregates products.

	Rarely	Sometimes	Often	Always
Gradation			1	8
Cleanness		2	3	4
Shape	1	3	4	1
Feed/rock characteristics		2	6	1

The remaining quality requirements and their prevalence may not be directly apparent from the table. This is partly because certain quality requirements are very product-specific. As an example, the quality requirement of cleanliness only applies to an application of crushed rock where the rock is used for anti-slip purposes. This type of rock is therefore only used for part of the year, making it difficult to assess its prevalence. Whenever

the rock is needed, this quality requirement is met, but the rock is not needed as often. Similarly, the shape requirement comes into play when producing aggregate for concrete and asphalt. Otherwise, the shape requirement is not encountered at all, but always when it comes to concrete or asphalt. In other words, when a single product has a clear application, and that application has a strict requirement, it also becomes a strict requirement for the aggregates manufacturer.

In turn, there are quality requirements for the recycling aggregates process that were not so clearly reflected in the table. A quality requirement specific to recycled material is related to cleanliness, i.e. how easily the recycled material floats. Similarly, harmful substances are sought in the recycled material. Products needs to be cleaned before crushing to ensure quality. In addition, during crushing for example, metals can be removed from the aggregate using a magnet. Regulatory quality requirements are becoming increasingly important in the recycling business. As an end product, the recycled material can be used, for example, as landfill, so there are no similar quality requirements compared to conventional crushing.

There are a few ways in which the customer can influence the quality of the final product. It all starts with cleaning the bedrock, as mud makes processing more difficult. Then there's the blasting of the rock, and blasting has a big impact on quality, especially if the crushers are small. Larger companies may have geologists at their disposal, so they can better assess the properties of the rock before extraction, and thus influence the direction of extraction. The importance of extraction is also underlined by the fact that the quality of the rock can vary significantly even within a site. Some areas may have significantly harder rock than others. In addition to these, quality is influenced by the machinery, namely the crusher settings, the meshing, and, for example, the wear parts. One interviewee noted that a case company had made changes to the crusher wear parts, and praised the change in quality and efficiency that they had made. A recurring theme from the interviews was the importance of skilled staff. Feeding the machine in the right

way has a big impact on quality and efficiency. In addition, these people, with their different screening skills and experience, are able to ensure quality.

When interviews were focused on quality standards and certificates, the one essential one that binds all aggregates manufacturers was found. This is the CE marking. CE-marking is required for every public project, as well as for other major construction projects. It varied a little depending on the respondent as to how often smaller private clients ask for them. This marking is mandatory under EU legislation, so it is understandable why it is always asked of aggregate producers. The literature review covered EN standards, and this CE marking ensures that these EN standards are met for the product in question. In other words, to meet the EN standard, a product must have a CE marking.

Customers shared their experiences with this CE marking, and the consensus was clear. The CE marking is relatively easy to achieve, and from another perspective it may not be as effective in communicating about the products. It tells you what the product contains, but not so much about how it is suitable for a particular application. Bulk aggregates material requires level AVCP 4, the lowest level of control. This means that the product does not need an external inspector to be CE marked but can be certified by the manufacturer itself through a laboratory. In contrast, asphalt products require level AVCP 2+, where the sample is taken by an external operator and the testing is carried out entirely by that operator. Because of this outsourcing, asphalt products are slightly more expensive to make, and not such an attractive proposition for a smaller company.

To get a quality product, it usually requires more precise crushing and screening. These additional costs also come at a price. The view of the interviewed customers was relatively consistent, these costs must be reflected to some extent in the prices. However, the quality cannot be so good with a single machine, but often the additional cost is for example an extra vertical shaft crusher or screen. The products are not really more profitable, but the costs are covered. Several interviewees state that quality has too little impact on the price, i.e. they do not get what they should get out of it. Quality has to be

maintained all the time, so the products actually go to e.g. a builder or a road paver at the same price. Only if the actual product is used to make asphalt, the cost is higher, so the price is higher. In addition, the end-user has to pay for this external quality control and additional laboratory visits, so the asphalt production is also more expensive for the end-customer for that reason. In contract crushing, price is such a big factor in winning tenders that quality is just a bar that everyone must cross.

4.2.3 Demand and market trends of aggregates products

The customers interviewed were asked to fill in a table with different types of aggregate products. This table can be seen in Appendix Two and completed here below in Figure 11. The purpose of the table was to identify concrete examples to support value selling and guided selling. The table lists the aggregates products, divided into base materials, concrete/asphalt materials, and other materials. These different products were asked to be ranked from 1 to 3 according to which products are the most important to the customer. In addition, a table was used to obtain the annual production volumes of the products, as well as the sales prices. In addition to these, the table shows a breakdown of product quality into A-C categories. Seven out of nine customers agreed to complete this table. In the completed table below, the numbers represent the number of times customers have responded to specific items. So, when the table shows a number 1, it means that one customer has responded in this way. Similarly, when there is a 2, two customers have said the same for a particular item. This pattern continues throughout the table.

End products			Annual production							Sales price (per ton)					Quality		
	Description	Size (mm)	> 25 000 t	25-50	50-75	75-100	100-150	150-200	<200 000 t	2-5 e	5-8 e	8-10 e	10-12 e	12-15 e	A	B	C
Base																	
	Rock dust																
		0-5	2			1	1			1	2					2	2
	Crushed rock																
		0-8	2	1		1	1				3					3	1
		0-16		1	1	1		1	1		3	1			2	2	
		0-32		2	1	1			2		3	1			2	2	
		0-56		2	1		1		1		4				2	2	
		0-90	1			1			2		3				1	3	
		0-150		1	1	1				1	2					4	
	Gravel																
		3-6	1	1	2								1	3	4		
		8-16	1	1	1	2						1	3		4		
		16-32	3		1						1		2		4		
		32-64	3			1							1	1	4		
	Recycled																
		0-45	2	2						3		1			1	3	
		0-90	1		1	1	1			3	1					4	
Concrete / asphalt aggregates																	
	Concrete																
		0-8	2			1			1		2	1			4		
		8-16	1		1	2						1	2		4		
		16-32	2	1							1		2		4		
	Asphalt																
		0-3	2		1						1				2	1	1
		3-8	2		1	1						1		1	4		
		8-11	1	1	2									2	4		
		11-16	1	2									1	1	4		
Other/deco																	
	Somero/singeli																
		8-16	2	1									1		1	2	
		16-32	2	1									1		1	2	
	Screened stone/cobblestone																
		50-100	3										1			1	2
		100-200	4										1	1		2	2
	Sand																
		0-4	2		1						1				2	1	
		0-16	3							1					2		1
		1-8	2			1								1	3		

Figure 11. Production, sales and quality of aggregates

If you look at Figure 11, you can see a rather fragmented view of aggregates manufacturing. This is partly because, for example, not all firms manufacture all products. An example of this is the companies involved in the production of asphalt/concrete aggregates, compared to the production of ordinary crushed rock. Rather than a scattered table of this kind, it makes sense to look at individual entities, and the responses of individual interviewees. Similarly, the priorities of a company will vary from case to case. When a company manufactures only part of the products, other products will naturally be given lower priority. For this reason, priorities have been removed from the table and will be highlighted later.

The quantities of recycled aggregates produced vary slightly between operators. One of the interviewees specializes in this and produces only recycled material. The rest take demolition waste in varying degrees, with many not doing it at all. Apart from one specialist, the customers interviewed give very low priority to recycled crushing in relation to the total amount of crushing they do. Production volumes vary due to randomness, and it is difficult to say a clear number. For recycled aggregates, the business is based on bringing the demolished concrete or asphalt to the crushers and charging the importer. Since the cash flow is generated on reception of the goods, the product is essentially a burden to the crushing company. The crusher may sell it off at the freight rate, or put a few euros or two on the price per ton. The recycled material has limited uses and makes it difficult to sell the product. However, there is a belief in the industry that recycled aggregate can be used in a more diverse way in the future, so this could drive up prices in the future. There are currently limited applications because the quality of recycled material is not quite at the same level as in new material crushing.

Similarly, to recycling crushing, this other/decoration category in the table is not a high priority for the customers interviewed. These materials happen very rarely, if at all, to be made. This is partly due to the fact that crushing companies mainly operate in the quarries, where natural rocks are in very short supply. When these decorative rocks are in short supply, they don't get screened either. For these reasons, among others, decorative rocks and sand can be sold at a good price, even above the scale shown in the table. The quality of these products cannot be influenced very much, although the right size can be obtained by screening the products. If necessary, sand can also be washed.

Table 12 shows the table of a single respondent converted into a bubble chart. This particular respondent is one of the largest companies interviewed and his result is scaled to the given scale. This single respondent serves as a good case study at this point, as their production volumes are very high compared to others, and they also manufacture a comprehensive range of products across their entire product repertoire. The idea of Figure 12 is therefore only to illustrate the phenomenon of the relationship between

production volumes and sales price. The graph has been constructed by dotting the individual products on the basis of the interview and the completed table, with production volumes in tons on the x-axis and sales prices on the y-axis. The size of the balls in turn represents the relative share of the total production volume, meaning, for example, that product 0-32 is the product with the highest production volume, accounting for about 23% of the total production. It is also important to understand that the center of the ball represents its position on both the horizontal and vertical axes. There may be a slight margin of error in this, since the table also gave intervals for production volumes and prices.

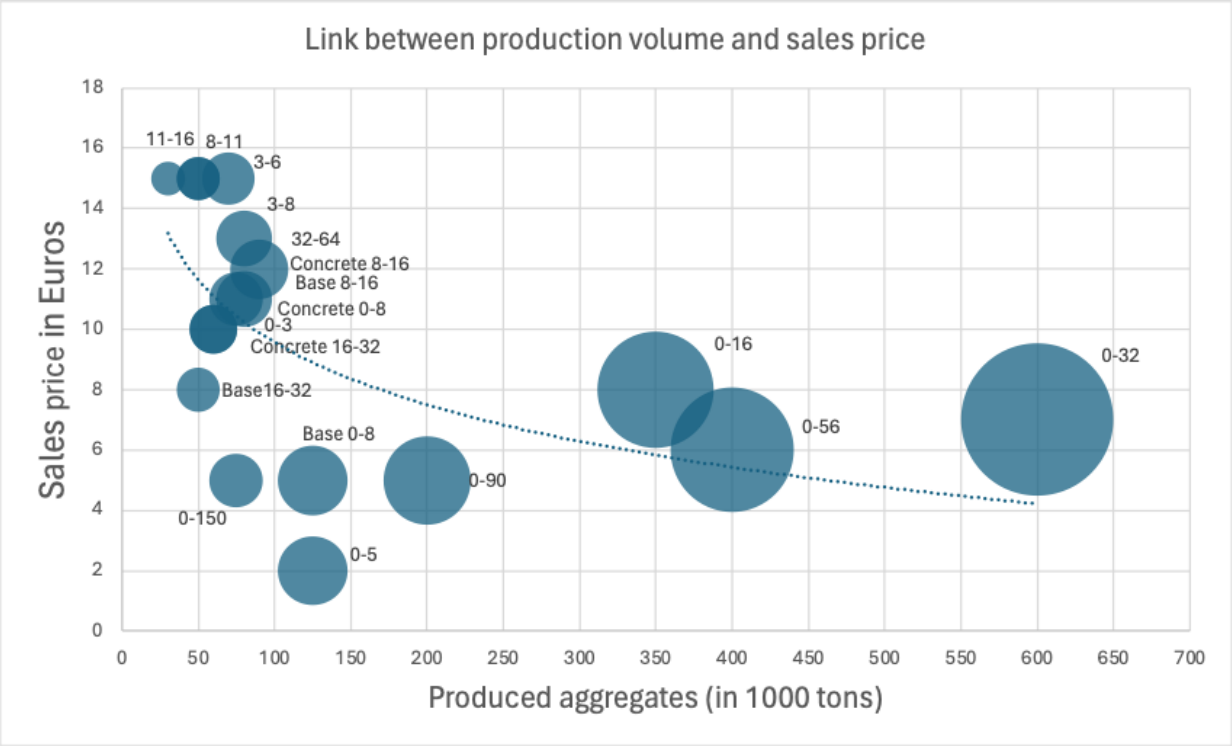


Figure 12. The link between production volume and sales price.

Figure 12 now shows more clearly the relationship between product volumes and sales price. Firms have the few products that are produced in the highest possible volume. Based on the interviews, it can be said that these volume products are the ones that are produced all year round and are therefore good products to cover fixed costs. These products are the standard crushed rock products, 0-16, 0-32 and 0-56. Their bulk nature is underlined by the fact that they are much more straightforward to manufacture than

other products. These products do not need to be screened for fines, which means that they can contain varying amounts of fine crushed rock. For this reason, the number of screening machines required is not so high and the costs for these products are therefore also moderate. Several interviews revealed that these products are very low margin products. Although they have a low margin, the production volume still makes them important products for aggregate producers.

Similarly, Figure 12 also shows lower volume products, but at the same time these products are sold at a higher price. So these are products that the company produces much less of, but which have the potential to generate a higher return. In terms of volume, these products are numerous, so that together they account for a significant proportion of total production. Some products are sold at a higher price because they are much more expensive to produce. The more expensive products therefore tend to require more energy to produce, as well as more screening. Of course, for individual products, such as asphalt products, the entrepreneur can also make a higher margin. As a rule, the more expensive products are more expensive to produce, but some individual products may give a higher margin. The graph therefore shows the products for asphalt production with the highest prices. On the other hand, products for concrete are similar to standard screened products, but with higher quality requirements. These products, for example, do not provide a better margin, but are mainly a service to concrete producers.

Figure 12 gives a good overview of the overall market. Thus, firms operate based on high volume-low margin products, and as well low volume-high margin products. Products such as 0-8 and 0-90 are so-called ' in-between' products, which are produced in smaller quantities and do not generate much revenue. Part of the reason for this is that screened products such as 8-16 produce 0-8 as a by-product. It is common in the industry that these fine-grained products do not sell very well. An important observation is therefore that it is not worth highlighting these products any further, as there is a desire to minimize their production. The priorities filled in the table by almost all companies reflected these observations. In order of priority, companies give equal importance to volume

products and to products with a higher selling price. Similarly, low priority was given to these in-between products.

The completed table, in Figure 11, also reflects customers' perception of quality. Both the table and the interviews suggest that in the sector, product quality is mainly seen as a bar to be crossed. The end customers have clear requirements for the end use, these requirements have to be met by the aggregate's producers. The more a product needs shaping or screening, the more it is perceived as being of high quality. As stated earlier, not all quality is reflected in the price. Exceptionally, asphalt rocks and rail track ballast are more valuable because they are less rare and difficult to make.

4.3 Decision-making in machinery selection

Next, this paper discusses the findings related to the choice of machinery. One purpose of the study was to identify the key customer value drivers that influence purchasing decisions in the aggregates business. This would allow the case company to better recommend machine combinations from a guided selling perspective. By better understanding the customer value drivers, and the issues that drive decision making, it is possible to develop value selling and guided selling tools.

When asked about factors related to the purchase of machinery, a comprehensive list of different things to consider came up. As the interviews were conducted with Finnish customers, the case company has an advantage in the purchase of machinery. The Finnish market may not have such a large supply of competing machines. The Finnish market particularly emphasizes this domestic character. Competition is also reduced by the fact that the typical Finnish rock is very hard, and the case company is known for crushing hard rock. In the soft rock market, there is more competition between equipment manufacturers. The advantages of being domestic are, for example, that customers receive service in their own language, have a familiar network of contacts and familiar

salespeople. In addition, at local level, the availability of spare parts also contributes to success. This and other aftermarket activities are issues that are also highlighted in other markets.

The issues relating to the machines themselves are certainly generalizable to users in other markets. After all, the purchase of machinery is based on the need to buy a machine, so the machinery needs to meet the company's objectives and needs. These needs may also be issues such as size, transportability, and ease of use, for example, which emerged in the interviews. Customers repeatedly asked for practicality, for machines that are simple and easy enough to use. They also want it to be robust and well built, using quality components. Because machinery is expensive to buy, customers want and demand quality machinery.

There is a certain link between the quality of finished products and machinery. It is clear to see that additional machine, for example, a vertical shaft crusher produce a better end product. However, not all operators can afford such equipment, so the equipment needs to be versatile. Versatility is, for example, a secondary crusher pre-screen that can remove smaller aggregates, resulting in a better grading of the actual end product, and the crushing process itself is more efficient. In other words, what ensures the quality of the final product is additional features such as screens. In addition, the wear parts of the machines allow for better quality as well as better capacity. Quality is a combination of many things. To differentiate a machine manufacturer from its competitors, it is important to emphasize the versatility of the machines. Machine features such as screens and advanced wear parts are what make the quality of the end products. It is not the machines themselves that guarantee quality, but their specifications. Except for mobile screens, where there are such significant differences in performance that screening efficiency may well differentiate them from their competitors.

Once the needs and machine characteristics have been identified, there is a choice between different machine manufacturers. The brand of the machine manufacturer

matters to customers. Customers in interviews state that the reputation of the case company has been an essential element in their decision to buy machinery. Reputation travels a lot in the industry, so when machines are sold in large numbers around the world, machine buyers are more confident in buying the machine in question. The final decision is also influenced by the price of the machinery. The investment is large, so the purchase needs to be carefully considered. The interviews showed that the purchase of machinery is slowed down by the sale of an old machine. Customers would be more likely to upgrade their machines if they could replace their current machine with a new one. The resale of machinery is slowed down by the limited number of machinery buyers on the market. The fact that machine manufacturers sometimes do not buy back machines also makes it difficult to resell them.

In order to better recommend the right combination of machines in guided selling, it is important in this study to gain an understanding of how customers decide on machine combinations. The answer to this question was clear, through the experience of the entrepreneur over a longer period of time. A recurring theme was that when an idea comes up, you put the machine combination to the test and see how it goes. It either works or it doesn't. Some customers use more support from the machine manufacturer to find combinations, while others do a bit more experimenting themselves. In general, customers were satisfied with the support from the machine manufacturer, while some were interested in seeing a bit more simulations and case examples. Customers also gave suggestions for improvements for machine manufacturers. The machine manufacturer was asked to provide ready-made machine configurations and to present ready-made machine combinations. Some customers stated that this would be challenging because the feed material has such an impact on these issues. It was also suggested that the machine manufacturer should organize seminar days to go through the crushing process. In addition, customers expressed the wish to be able to test drive the crushers.

When it comes to the impact of the technology used on the choice of machinery, customers have mixed opinions. Interviewees said that for their clients, it is only for larger

contracts and municipal contracts that there is sometimes a discussion about the technology used. For example, at the time of tendering, some towns may require the crusher's engines to meet the latest emission standards, or that the machines are powered by electricity. However, repeatedly it emerged from the interviews that after tendering, these criteria are often not adhered to, but rather the price is the deciding factor. Some customers say that the technology of the machines does not affect their success in the market, while others say that about once a year a contract is not tendered for because of these technological requirements.

However, there is a latent sense in the industry that cleaner technology will matter in the future. Many customers perceive, and see the possibility of, some form of carbon footprint mapping or emissions legislation on the horizon. Already, some of the interviewees have started to react to this, for example by electrifying their fleet or, for example, by making the environmental product declaration (EPD) on their end products. Even if at present the environmental requirements are smaller, such as rubber lining of the feed section or lowering engine emissions, there is nevertheless a growing environmental demand. Nevertheless, currently the main drivers in tenders are price, quantity, who will blast the rock and who will sample the final products. Success in tenders is also influenced by how much a company can do in terms of high capacity. Of these issues, price is by far the most important.

The calculation of financial ratios related to the purchase of machinery varies significantly between customers. As a generalization, some kind of estimate of the payback period, for example, has to be calculated for the machinery financiers alone. These financiers, be they banks or owners of larger companies, can be precise about these ratios. An example that emerged from one interviewee was that the payback period for machinery must be 3-5 years in order to obtain financing for the machinery. However, calculating these ratios is challenging, as machinery can be subject to unexpected and costly repairs. On the other hand, the resale value is not really considered by customers,

as resale of the machines is difficult. Of course, they try to extend the service life as much as possible, but not for the sake of resale.

During the interview, customers were asked to rank the customer value drivers associated with their machines. There were ten options, with the most important attribute being 1 and the least important attribute being 10. These more detailed customer value drivers related to the machines are color coded in Table 5 with customer responses. The color coding of the table is green-yellow-red. In practice, the most important attributes are in green, the yellow ones in the middle, and the least important ones are in red. There is also variability within a color, with darker green being a smaller number than light green, and darker red being a larger number than lighter red.

Table 5. Customer value drivers in machinery

	Capacity	Efficiency	Reliability	Investment price	Environmental requirements	Upgradability	Easy-to-use	Safety	Transportability	Ease of maintenance
Customer 1	3	1	2	6	9	10	4	5	8	7
Customer 2	2	1	3	4	9	10	6	8	5	7
Customer 3	2	1	3	8	7	9	4	10	6	5
Customer 4	3	2	4	1	7	9	8	6	10	5
Customer 5	3	2	1	4	10	9	5	6	7	8
Customer 6	2	1	3	5	9	10	6	8	7	4
Customer 7	3	2	1	4	10	9	5	6	8	7
Customer 8	2	1	4	3	9	6	7	8	10	5
Customer 9	2	4	1	7	8	10	9	3	6	5

This kind of color coding helps the viewer to notice recurring themes. Colors make it easier to identify extremes, and their prevalence. Table 5 shows clear themes. Efficiency is considered to be the most important characteristic of the machines. In addition, capacity and reliability are also highlighted in green. On the contrary, the least important features are upgradability and meeting environmental requirements. These are therefore highlighted in red. After the themes of the extremes, the order of the remaining characteristics is not so clear. It is therefore useful to look at the averages of the choices using Table 6 below.

Table 6. Customer value drivers ranked.

Characteristic	Average
Efficiency	1,7
Capacity	2,4
Reliability	2,4
Investment price	4,7
Ease of maintenance	5,9
Easy-to-use	6,0
Safety	6,7
Transportability	7,4
Environmental requirements	8,7
Upgradability	9,1

Table 6 shows customer value drivers ranked by average value. After the three most important attributes, the average rises by 2.3 points, reflecting the importance of the first three in relation to the others. In turn, attributes 5 to 8 are relatively close together, within 1.5 units of each other. The last two are further away from the others, but close together. As the sample size is only nine, individual outliers can change the magnitude of the mean significantly. It is also useful to understand the reasons behind the individual choices, why a particular customer chose to respond in a significantly different way from the others. For example, a customer that is engaged in recycling crushing prioritized cheaper machines because of its business model, and thus prioritized the cost of the investment, had a significant impact on the mean. If that result were removed from the mean, the new mean would be 5.1 instead of 4.7. Similarly, two customers do not move their crushers much, so they gave transportability a score of 10. As a result, the mean for transportability is 7.4, which could be 5.9 without those fixed plants.

4.4 Distributor insights

To support and extend the customer interviews already discussed, this study also used the distributor network of the case company. The distributors were interviewed using the same idea as the customers. This means that the distributors were asked to look at the questions through the eyes of the customer. In the end, responses were received

from four countries: Belgium, Sweden, Germany, and the United Kingdom. The distributors represent their own view of the customers in their own country. As the distributors each serve customers in their own country, their customers are also very diverse. Similarly, as in Finland, other markets have significantly different players of different sizes. General information can therefore be very similar to that in Finland. The companies employ around 15 people, the number of machines varies according to size, as does the distribution of direct sales and contract crushing.

Table 7 below shows distributors' views on the pricing logic for customers. In fact, distributors' responses did not differ significantly from customers' views. Of course, there may be different emphases in different markets, but broadly speaking they are the same. One interesting observation that emerged from the distributors is the inventory levels. Some customers' pricing is heavily influenced by how much of the product they have in stock. If customers have significant amounts of product in stock, they will sell that product at a lower price to reduce the amount of inventory. This may also be the case for Finnish customers, but it did not come up in the customer interviews.

Table 7. Distributor views on pricing

	Not at all	To a small extent	To a moderate extent	To a large extent
Transport			2	2
Quantity		2	1	1
Competitor price			1	3
Contract deadline			4	
Production cost			2	2

As in Finland, other markets tender their contracts, and the tendering happens only with one cycle. On the private side, there may be more bidding rounds, which in turn leads to the lowest possible price. Of course, customers may already put a higher price on the private side in the first bid. In other markets, the same practices apply as in Finland. Sweden may have longer payment periods than Finland. In other markets, distributors find that smaller products bring more profitability in terms of pricing. The view is that quality will also be reflected in profitability, especially in the Swedish market.

The distributors' responses underline the view that the quality requirement of the market is a prerequisite for a company to be able to compete for sales. The quality table is below, table 8. Quality characteristics must therefore always be right in order to survive in the market. An example of this is that flaky products are difficult to sell. As far as quality management is concerned, the methods are the same, and asking for the relevant certificates is similar. In the UK there is a BS standard, which in practical terms is equivalent to the CE standard.

Table 8. Distributor views on quality requirements.

	Rarely	Sometimes	Often	Always
Gradiation		1		3
Cleanness			2	2
Shape	1			3
Feed/rock characterictics			1	4

In the eyes of the distributors, one of the most important features for the customer when buying machinery is the price. Naturally, it is one of the essential things that is discussed with the dealer, so that is another reason why it was highlighted in the dealers' responses. Table 9, which shows the distributors' answers to the last question, shows that, the price of the investment is the second most important feature of the machines for customers. Practically every distributor mentioned price when talking about the purchase of machines. Machine efficiency is an important feature for their customers, although customers are not necessarily ready to switch to electrified machines. To their choice of machines, dealers add that aftermarket support is very important. Quality and brand are also factors driving customers' decisions.

Table 9. Distributor views on machinery.

	Capacity	Efficiency	Reliability	Investment price	Environmental requirements	Upgradability	Easy-to-use	Safety	Transportability	Ease of maintenance
Distributor 1	5	2	1	4	8	7	3	9	10	6
Distributor 2	3	1	4	2	9	10	8	7	6	5
Distributor 3	3	1	4	2	10	7	5	9	6	8
Distributor 4	2	3	4	1	7	9	6	10	5	8
Mean:	3,25	1,75	3,25	2,25	8,5	8,25	5,5	8,75	6,75	6,75

When deciding on the choice of machinery, they emphasize the expertise of the machine manufacturer to recommend the right machine combinations. Distributors use various simulation tools from the machine manufacturer to simulate the use of different combinations, so these tools are essential for the cooperation between distributors and customers. One distributor points out that it takes almost five years to train a good and skilled salesperson. The more a machine manufacturer can share its skills with the distributors, the easier this training process will be. To better recommend machine combinations to customers, dealers need to be supported by digital tools for machine recommendations.

4.5 Summary of key findings

This section provides a summary of the most relevant findings that came out of the empirical research in this paper. The table below shows the issues affecting the pricing of aggregates products. The table is divided so that contract crushing is separated from direct sales of products. In some cases, such as production costs, the business model does not affect pricing, so they are combined in that table.

Table 10. Aggregates material pricing logic.

	Direct selling of aggregates material	**Contracting the crushing as a service**
Transport	To a moderate extent. Typically, pick-up and delivery price are listed separately. Transport can be in the region of 3e per kilometer. In addition, the opportunity	To a large extent. Significant impact on the submission of a bid. Moving equipment is a significant cost, less moving

	cost is considered, i.e., how long it will take the driver.	means lower prices also for the end customer.
Order quantity	Quantity affects pricing by 0-10%, typically 2-5%. If the destination is easy, nearby and a big job, the discount percentage can be high.	A typical contract size is 20 000 - 30 000 tons. 10 000 and below is not profitable. For larger ones, you don't have to move equipment, so it makes a big difference to the price. Of course, larger contracts are also more profitable for the crusher, so the whole saving from relocation does not go into the price.
Competition	Small impact on pricing.	Moderate impact on pricing, it is generally known that the lowest bidder often gets the contract. Competition is open, competitors' potential is often known.
Timeline	In spring and summer there is more demand, and you get a better price.	Not much impact on pricing. They want the jobs to be sequenced so that the machines are running all the time. Rarely does the schedule have an impact on the contract being awarded.
Production cost	An important factor in pricing, the basis for pricing. Fluctuations in the pricing of fuels and other costs also affect the pricing of final products. However, wear and tear of machinery and spare parts cannot be included in prices as such.	
Quality of aggregates	If more costs have been spent on quality, the costs are passed on to prices. Higher quality products have a slightly better profitability, but in general the industry considers the price of quality to be insufficient.	
Others	In addition, permits, both transport permits and crushing permits, affect pricing. The customer relationship has some influence, with more flexibility in the price for loyal customers.	

Table 11 below shows the quality requirements found. The table shows the quality requirement broken down into different rows, with information on the generality of the requirement in the column next to it. The aim here is to clarify when a particular quality requirement appears, and why.

Table 11. Quality requirements and their prevalence.

Quality requirement:	**Regularity:**
Gradation	In practice, the most important requirement in terms of quality. Almost all customers will ask about it or make demands, whatever the application.
Cleanness	Very product specific. In particular, crushed rock for anti-slip uses must be clean and dry.
Shape	The shape is always asked for when making concrete or asphalt. However, it is less common, so often the shape does not matter. For those who put their efforts into shape, there is the vertical shaft impact crusher.
Feed material	Finland has on average very hard rock, so the feed material is usually sufficient for normal applications. However, asphalt and rail track ballast require the hardest possible rock, and thus for these products it is the most common and most difficult quality requirement.

The customer aims to influence the quality of the aggregates through these things:

1.) Precise cleaning of surface material
2.) Blasting the rock in the right way.
3.) With the machine itself: Screening, settings, wear parts.
4.) Analysis of the end products, either by themselves or by a laboratory.

The choice of machines is driven by customers' focus on volume products such as 0-16, 0-32 and 0-56, as well as on single, more profitable asphalt products such as 8-11 or 11-22. The availability and the speed of delivery of spare parts have a significant influence on the purchase of machines. Customers highly value the aftermarket, which has a significant impact on the purchase of machinery. In addition, a comprehensive service network is valued. Finally, the quality and efficiency of the machines play a significant role in the purchase of machines and whether the brand of the machine can be trusted. In terms of features, efficiency, capacity and reliability are valued.

5 Discussion

This chapter discusses the research and its background. The chapter is divided into three parts. The first section 5.1. discusses the findings of this paper as a whole, drawing together the findings to answer the research question and objectives. Section 5.2. then presents the practical and theoretical contributions of the study. The purpose of the section is to illustrate and instruct the practical steps and concrete actions of the case company towards the findings of the study. The final section, 5.3, discusses the evaluation and limitations of the study. In addition to the evaluation and limitations, ideas for future research are presented.

5.1 Conclusions

This section briefly reviews the main results of the study. The section will go through the research objectives, which will help to answer the main research question. The objectives act as a kind of sub-questions, setting the scene for the main research question. The first research objective was this:

- To identify the key customer value drivers that influence purchasing decisions in the aggregates business, focusing on final products of customers.

The study identified several significant customer value drivers in relation to machinery. Customers put cost efficiency as the most important feature of machines. This driver could be leveraged by the case company for use in machine-related marketing and sales. The next most important factors were the reliability and capacity of the machines. These three key characteristics should therefore be the focus of the machine manufacturer's development efforts. In addition to these machine characteristics, there are other factors that customers consider when buying a machine. A particularly important customer value driver is the after-market services offered by the machine manufacturer, such as machine maintenance and spare parts availability. When machines break down, help is

needed immediately to ensure that the customer's entire business does not come to a standstill. This is why customers value not only the reliability and quality of the machines, but also the ability of the machine manufacturer to help in case of problems. This can be developed, for example, by offering services in the customer's own language, and by putting familiar contact persons close to the customer. Value is often driven by production efficiency, machine versatility, operating costs, and profitability of the end product, rather than by initial investment costs alone.

- To examine how variations in product requirements (e.g., size, shape, quality of aggregates) and market demands affect pricing and customer profitability in the B2B aggregates market.

This study shows that the price of aggregates products varies mainly according to the size of the individual product. Only really hard rock is needed for the production of asphalt, so there may be price variability within the same product size. In other words, a harder rock can achieve a better price if it is used to make asphalt. Of course, this is not true everywhere either, as there are also producers in the market who sell their higher value product at the same lower price. In practice, therefore, the more experienced players know how to sell it at a higher price, which also leads to better margins. For other products, quality is mainly a customer requirement that is implemented. However, this desire does not necessarily translate into a better margin, but the cost of making quality just increases the price to the consumer. An example of this is the rocks used to make concrete. For this purpose, certain requirements are imposed on the rock material, but the customer is not prepared to pay a higher margin to the crushing contractor.

Overall, it can be said that quality does increase the price of products, but only in a few cases does it lead to better profitability. Smaller products require more energy to make, and possibly more machinery. Naturally, the smaller the product, the higher the price. Customer volume products are 0-16, 0-32 and 0-56, as well as more profitable asphalt products such as 8-11 or 11-22. In spring, when demand is high, the price is slightly

higher for all products. More than quality, the pricing of products is influenced by transport costs, quantities ordered and most importantly, manufacturing costs. Manufacturing costs are reflected in the prices to the end customer. Ultimately, however, it is the market situation that determines the final exact price, but it is not more important than the factors mentioned above.

- To explore the role of value-based and guided selling strategies in enhancing machine combination recommendations that align with customer needs and optimize end-product quality.

Taken together, the theoretical basis of this paper and the empirical phase of the research can provide a basis for the development of value-based sales tools. Value-based selling allows sales teams to justify higher pricing by emphasizing more valuable features to customers. When value-based selling is done using the theoretical framework of this paper, by combining key machine-related attributes such as efficiency, reliability, and capacity together with mathematical values, more customer-oriented sales performance can be achieved. Guided selling, in turn, can help customers select optimal machine combinations based on their production objectives.

How can identifying and leveraging customer value drivers improve solution selling and optimize machine combination sales in the aggregates business?

This research culminates in the identification and leveraging of customer value drivers that allows for tailored sales approaches that understand customers' specific needs and priorities. In particular, identifying machine features that are important to customers, such as efficiency or reliability, enables more customer-oriented marketing and sales. Highlighting these issues in terms of numerical benefits enables a move away from price-driven discussions. In addition, the guided selling tool allows machine recommendations to be made easily available to the customer, as this tool is accessible on the internet. It eliminates the need for customers to contact the machine manufacturer or its distributor

to obtain machine solutions. It should also ease the burden on new employees in particular. This is because it can be difficult for new employees, whether they are employed by the machine manufacturer, distributor or customer, to understand the ideal machine combinations. Now new employees could use the guided selling tool to better understand the best possible machine combinations. So overall, this should improve sales performance, but also improve the customer's sales experience because of its digital ease.

5.2 Implications for the case company

The purpose of this section is to look at the concrete implications of this whole study. It will consider what practical steps the case company could take to achieve the benefits identified in the study and how to implement them. At the same time, this serves as part of the final section of the study's objectives, which sought to propose actionable strategies for the case company. These serve only as a recommendation of the ideas that emerged from the study. Companies in the sector can use these ideas to improve their own operations and sales.

As a first step, it is recommended to calculate more accurate consumption values. As efficiency was the most important feature of the machines for customers, this is a clear sign to highlight the impact of this feature on their business. The case company should therefore illustrate in both value sales materials and guided selling materials a more mathematical realization based on consumption. This could be illustrated by case studies, taking specific types of input materials and end products, and using these to illustrate specific examples of changes in consumption. While not all these test applications can be fully applied to the situation of individual customers, the test methods could be kept the same, allowing machines to be compared with each other. For example, when selling new machines, the evolution of fuel economy could be reported with information on existing and new machines. If the exact consumption values were known, they should be used as numerical values in value sales material. If the accuracy of the value sales material were questioned, case studies should be shown to prove the accuracy.

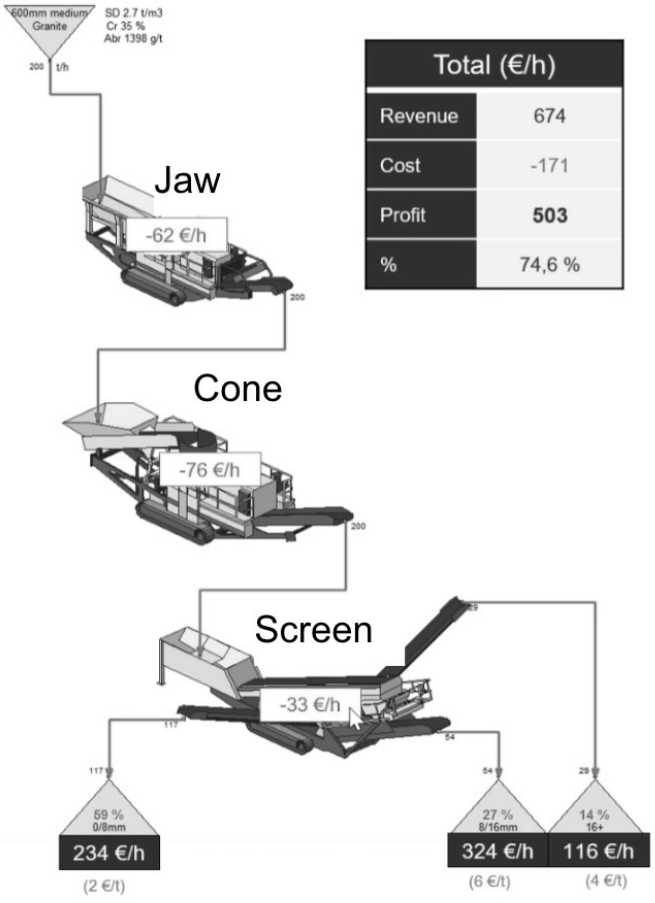
If the consumption of machinery were calculated using different examples, the calculations could also be used to promote environmental awareness. When machinery consumption and emission values go hand in hand, the environmental impact could be calculated at the same time. Customers felt that in the future environmental awareness will become more and more important, so the calculation of these emission values could go hand in hand with the calculation of consumption values.

Similarly, as with operating costs, one could highlight case studies where capacity varies. This could be done, for example, by looking more closely at the different capacities of different machine combinations, and which combinations maximize the most desirable products while minimizing the undesirable ones. As capacity was the second most important machine characteristic for customers, this could be illustrated by practical examples. It would be important to make available case studies that fit the specific customer's case. These examples could be used to highlight the profitability of upgrading machines, for example through changes in capacity or efficiency.

Alongside the features of the machines, the case company should also emphasize their comprehensive service business. One important factor in a customer's purchasing decision between different equipment manufacturers is the speed of service and the availability of spare parts. A very critical feature for the customer is how quickly they can get a competent person on site, or alternatively the right spare and wear parts. This is an area where machine manufacturers should pay attention. This can be improved by having more warehouses close to the customer, or, for example, by having employees who can serve the customer in their own language.

One way to increase sales of complete machine combinations is to develop effective value sales materials. As the dealer interviews showed, customers and distributors work together to come up with different machine combinations using the machine manufacturer's simulation tools. Now that it is known that customers value the efficiency of

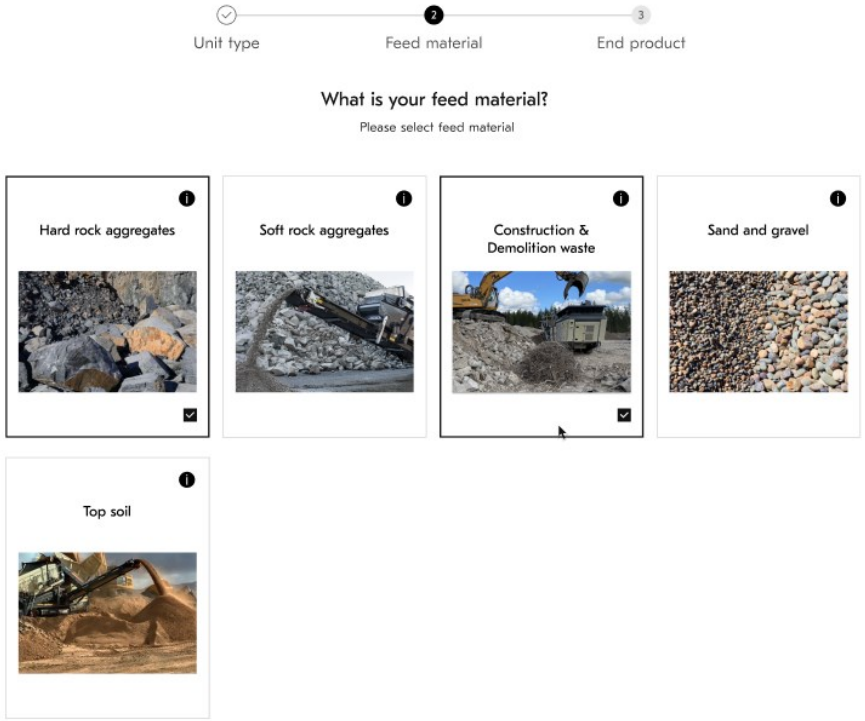
machines above all else, value sales materials could be created to support the right choice of machines. In this situation, a machine solution could be recommended based on the products the customer wants to make, and the cost and profitability of doing so. An example of this is shown below in picture 1. This picture therefore only serves as an example of a practical way to add features relevant to customer profitability to an existing simulation. This could be done by allowing the customer to enter or select some values, such as the selling prices of products. If a case company were to create such models, the customer would be able to better weigh up different combinations of machines.



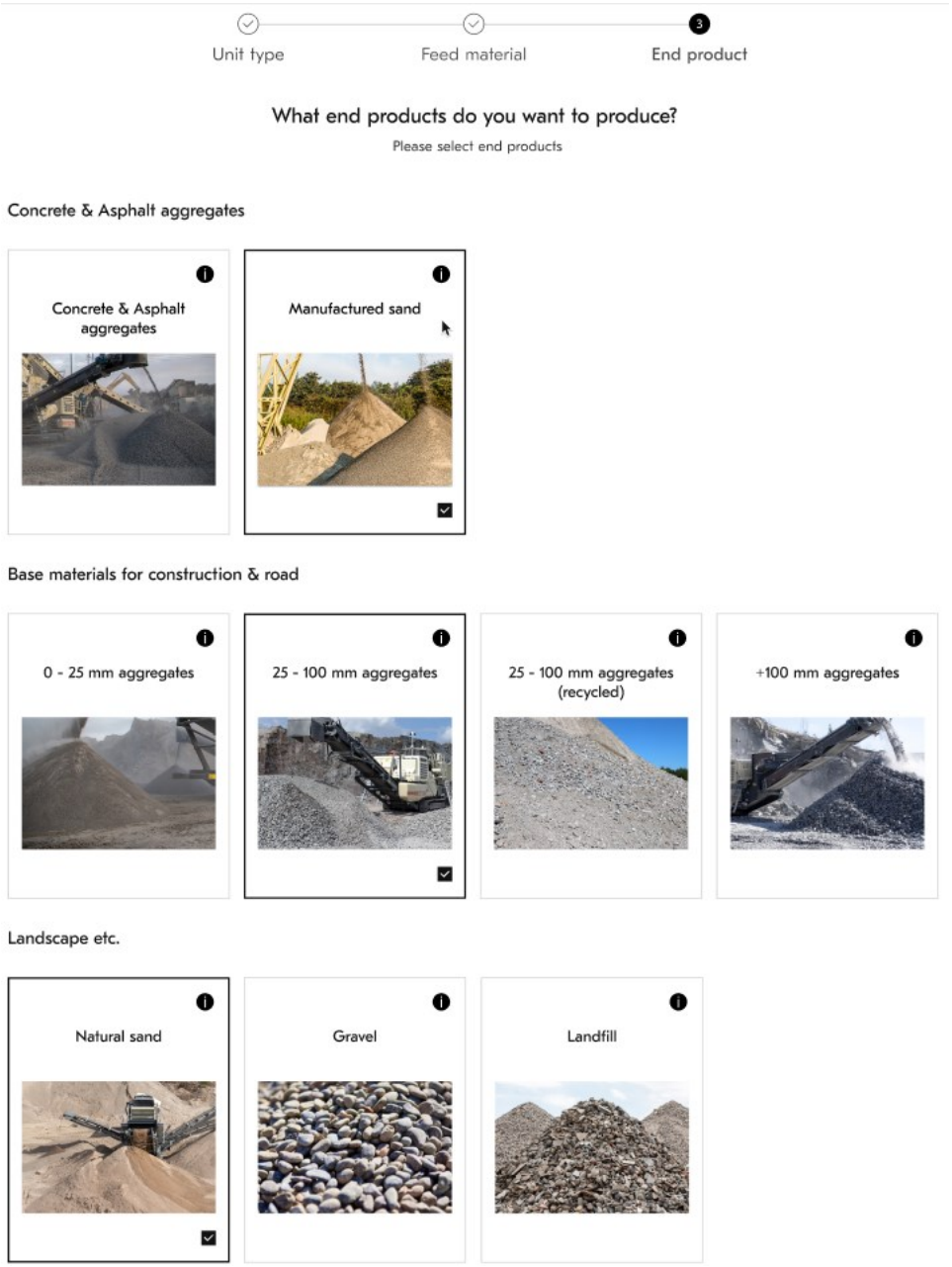
Picture 1. Value sales example

One of the purposes of this paper is to contribute to the development of a guided selling tool. The findings of this research have enabled the development of such a tool. Pictures

2 and 3 below are examples of what this guided selling tool currently looks like. Figure 2 shows the point in the tool where the user, for example a customer or distributor, selects his input material. He then selects the products he wants to produce. The product selection is shown in Figure 3. After these selections, the tool suggests the right combination of products to the user to meet the customer's needs. This tool is to strengthen the marketing of products and meet customer-specific demands.



Picture 2. Guided selling tool, selecting feed material.



Picture 3. Guided selling tool, selecting the end products.

5.3 Limitations and future research

This section discusses the limitations of the study and explores the possibilities for further research. In the study, a total of nine customers from Finland and four distributors

from different European countries were interviewed. As the study was qualitative in nature, and was conducted through interviews, the results reflect only the views of a certain number of companies. This means that generalizability of the results to different markets is limited. The customers interviewed are based in Finland, so different markets may have different characteristics. This was minimized by interviewing distributors in order to gain insight and confirmation from other markets. In addition, only one period of time was studied here, meaning that, for example, the development and change of legislation or sustainability requirements cannot be fully predicted in this study.

In the future, more research could be done into the use of value sales materials and guided selling materials. This study contributes to the creation of these materials, but it does not explore their adoption. As case companies or the industry otherwise begin to use guided selling and value selling materials more, it would be possible in future research to examine their impact on sales situations. In addition, future research could examine the opinions of different actors, such as customers or distributors, on such materials created on the basis of this study. The possibility of using AI to generate machine recommendations should also be explored. In addition, a comprehensive matrix between different feed materials and end products should be established. The feed material has a significant impact on the final product produced, so it would be useful to understand the comprehensive range of feed materials.

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Appendices

Appendix 1. Customer interviews form

Customer interviews

General information

1. Company name?

2. How many people work in the company in relation to aggregates business?

3. How many machines do you use?

	0	1	2	3	4	≥5
Mobile jaw	◯	◯	◯	◯	◯	◯
Mobile cone	◯	◯	◯	◯	◯	◯
Mobile impactor	◯	◯	◯	◯	◯	◯
Mobile screen	◯	◯	◯	◯	◯	◯
Stationary Jaw	◯	◯	◯	◯	◯	◯
Stationary Cone	◯	◯	◯	◯	◯	◯
Stationary Impactor	◯	◯	◯	◯	◯	◯
Stationary Screen	◯	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯	◯

4. What proportion of your business involves **directly selling crushed aggregate** products versus **providing crushing services** where you crush materials for others?

   Directly selling crushed aggregate = Aggregate crushed by you or a third party and sold to the end customer.
   Crushing service = Contracting, you sell the processing of aggregates (crushing/screening, etc.)

   - ◯ Only direct selling
   - ◯ Direct selling ~75%, and contracting ~25%
   - ◯ 50% / 50%
   - ◯ Direct selling ~25%, and contracting ~75%
   - ◯ Only contracting

End-products

5. What factors do you consider when **setting prices** for different aggregate types? How these given factors influence pricing?

	Not at all	To a small extent	To a moderate extent	To a large extent
Transport	◯	◯	◯	◯
Order quantity	◯	◯	◯	◯
Market/Competitor price	◯	◯	◯	◯
Contract deadline	◯	◯	◯	◯
Production cost	◯	◯	◯	◯

6. How does **customer type** (e.g., private, public sector) influence pricing or payment terms?

7. What are the most common **quality requirements**?

	Rarely	Sometimes	Often	Always
Gradation	◯	◯	◯	◯
Cleanness	◯	◯	◯	◯
Shape	◯	◯	◯	◯
Rock characteristics (feed)	◯	◯	◯	◯

8. What are the **main factors that affect the quality** of your products, and how do you actively manage these?

9. How often do customers request specific **standards or certifications**?

10. How does the **quality of product** affect the pricing? (Specification, use application)

11. What are the key factors affecting the **cost** of different end products?

12. How big are the differences in the **profitability** of the end-products?

Machinery selection

13. What factors **influence your decision** when purchasing machines?

14. How do you determine the **ideal machine combination** for your production line?

15. How could the machine **supplier better assist** you in selecting the right combinations for optimized production?

16. How does the quality requirement for aggregates affect the choice of machinery?

17. How often do your customers ask about the **technology** you use to produce aggregates?

18. How does the machinery affect your **success in winning tenders**?

19. How do you evaluate the **return on investment** (ROI) when purchasing a new machine?

20. Rank in order of importance

- Capacity
- Efficiency
- Reliability
- Investment price
- Environmental requirements
- Upgradability
- Easy-to-use
- Safety
- Transportability
- Ease of maintenance

Appendix 2. Table of aggregates products

End products		Priority	Annual production								Sales price (per ton)					Quality		
Description	Size (mm)	(1-3)	> 25 000 t	25-50	50-75	75-100	100-150	150-200	<200 000 t		2-5 e	5-8 e	8-10 e	10-12 e	12-15 e	A	B	C
Base																		
Rock dust																		
	0-5																	
Crushed rock																		
	0-8																	
	0-16																	
	0-32																	
	0-56																	
	0-90																	
	0-150																	
Gravel																		
	3-6																	
	8-16																	
	16-32																	
	32-64																	
Recycled																		
	0-45																	
	0-90																	
Concrete / asphalt aggregates																		
Concrete																		
	0-8																	
	8-16																	
	16-32																	
Asphalt																		
	0-3																	
	3-8																	
	8-11																	
	11-16																	
Other/deco																		
Somero/singeli																		
	8-16																	
	16-32																	
Screened stone/cobblestone																		
	50-100																	
	100-200																	
Sand																		
	0-4																	
	0-16																	
	1-8																	