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Customer's perceptions of value during the lifecycle of concentrate filtration

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ABSTRACT

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The objective of this study was to examine how customers purchase complex industrial solutions in mining industry, and what kind of value they perceive during different phases of the solution life cycle. In addition, a systematic method for understanding customer value was developed, which can be applied for other company's offerings as well. The method includes step-by-step instructions for 1) the collection of customer value data and 2) implementation of the findings.

The theoretical part of the study focuses on solution and customer value literature in business-to-business markets. In this study qualitative embedded multiple-case study was used as a research method. The primary data was collected through in-depth interviews in two market areas and by participating in customer meetings as an external observer.

The results show that there are two ways of buying solutions that needs to be treated individually. Customers prefer to buy solutions from engineering companies as they think that suppliers still need to work on their solution capabilities. Therefore, Outotec should focus more on marketing itself as a solution provider. Customers buy solutions that create the most value with the lowest risk and they need to be supported throughout the solution lifecycle. References that demonstrate previous experience are the most effective way to reduce customers' risk. However, the customer-perceived values and challenges differ between the market areas, and thus, suppliers should have divergent strategies for specific market areas.

TIIVISTELMÄ

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Tämän työn tarkoituksena oli tutkia, miten asiakkaat ostavat monimutkaisia teollisia ratkaisuja kaivosteollisuudessa, ja minkälaista arvoa he kokevat ratkaisuista elinkaaren eri vaiheissa. Lisäksi työssä kehitettiin systemaattinen menetelmä asiakasarvon ymmärtämiseen, jota voidaan tulevaisuudessa hyödyntää muiden tarjoomien osalta. Menetelmä sisältää selkeät ohjeet 1) asiakasarvon keräämiseen, sekä 2) löydösten jalkauttamiseen.

Tutkimuksen teoreettinen osuus keskittyy ratkaisu ja asiakasarvo kirjallisuuteen teollisilla markkinoilla. Tutkimusmenetelmänä käytettiin laadullista tapaustutkimusta, joka sisälsi useamman tapauksen. Ensisijainen aineisto kerättiin haastattelujen avulla, sekä osallistamalla asiakastapaamisiin ulkopuolisena tarkkailijana.

Tutkimuksen tulokset osoittavat, että asiakkailla on kaksi tapaa ostaa ratkaisuja, joita täytyy käsitellä itsenäisesti. Asiakkaat käyttävät mieluummin insinööritoimistoja ratkaisujen ostoprosessissa, koska toimittajien ei uskota olevan vielä valmiita kokonaisratkaisujen toimittajiksi. Outotecin tulisikin yhä enemmän keskittyä markkinoimaan itseään ratkaisujen tarjoajana. Asiakkaat ostavat ratkaisuja, joista he kokevat saavansa eniten arvoa pienimmällä riskillä. Asiakkaille tulee myös tarjota tukea koko elinkaaren ajalta. Kehittämällä referenssejä, jotka havainnollistavat aikaisempaa kokemusta, voidaan tehokkaimmin pienentää asiakkaan kokemaa riskiä. Eri markkina-alueilla asiakkaan kokema arvo on kuitenkin erilaista, joten toimittajien tulee kehittää erilaiset strategiat kullekin markkina-alueelle.

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ABBREVIATIONS

APAC	Asia-Pacific
B2B	Business-to-Business
B2C	Business-to-Consumer
CAPEX	Capital Expenditure
DMU	Decision making unit
MEW	Metals, Energy & Water
MP	Minerals Processing
OEE	Overall Equipment Efficiency
OPEX	Operating Expense
PLC	Programmable Logic Controller
PO	Purchase order
R&D	Research and Development
RFQ	Request For Quotation
RIVIS	Realizing Intangible Value from Integrated Solutions
S-D logic	Service dominant logic
SEAP	Southeast Asia and Pacific
TCO	Total Cost of Ownership

1 INTRODUCTION

Intense competition in diverse industries has driven companies to differentiate themselves from competitors by offering customer solutions. Customers are nowadays outsourcing or renting several functions of their operations and focusing more on their core business (Tuli, Kohli & Bharadwaj, 2007; Ulaga & Reinartz, 2011). This phenomenon gives opportunities to suppliers to develop and create customer solutions in order to grow their profits and margins.

Previous research indicates that suppliers and customers have different perceptions of what actually is a solution. Suppliers perceive solution as a customized and integrated combination of goods and services, whereas customers see solution as relational processes from the requirements definition to post-deployment support (Tuli et al., 2007). The difference between customer's and supplier's view of solution has led to studies of how to create and deliver superior customer value. Concepts of integrated solutions and customer value are tightly related to each other as in solutions business superior value is always co-created with customers. Yet, many suppliers fail to deliver profitable customer solutions due to the complex nature of solutions and the difficulty to master and copy them (Day, 2004).

The academic literature has already answered some of the challenging questions related to how customers and suppliers view a solution and how to manage the organizational transition from an equipment manufacturer to a solution provider. Still many of the important questions remain open (Tuli et al., 2007; Oliva & Kallenberg, 2003). Even though solution selling as a concept has been around for several years little is still known about how to become a solution provider, and how customers experience solutions compared to pure products (Evanschitzky, Wangenheim & Woisetschläger, 2011). In general, the customer's perspective on solutions, such as how they buy solutions, why they buy solutions, and what is the customer's understanding of value co-creation in solutions business, still need

more attention. Moreover, studies of cultural differences influencing the customer value perceptions and benefits have been scarce.

This study is part of the Tekes funded RIVIS (Realizing Intangible Value from Integrated Solutions) –research project, which examines how technology suppliers can create value for customers by integrating products and services into total solutions, so that customers would not have to buy the individual components separately. The project is conducted in collaboration between Lappeenranta University of Technology, Outotec, Vaisala and Teknikum.

1.1 Research questions and objectives

This study examines how suppliers could create more value for customers by providing them solutions instead of pure products. The purpose is to get better understanding of how customers buy complex industrial solutions, and what kind of features are important for them during different phases of the solution lifecycle. Since the supplier's and customer's view of a solution differs from each other, it is essential to understand the customer's perspective of a solution. For suppliers, such as Outotec, a customer can be an engineering company or an end customer. For end customers, a supplier can be an engineering company or a solution provider/equipment supplier, such as Outotec.

Customer value perceptions are examined from two important market areas in terms of the Dewatering plant solution, which are South America and Australia. In addition, a systematic method for understanding and gathering customer value is developed. The purpose of the method is to be leveraged for Outotec's other business areas, too. The research questions and their objectives are presented in the following Table 1.

Table 1. Research questions and objectives

Research question	Objective
1. How customers in mining sector purchase Dewatering plant –solutions?	To understand the buying behavior of a customer.
2. How customers perceive value during the lifecycle of the Dewatering plant –solution?	To get new insights for value propositions and create more value for customers.
3. How customers' value perceptions of the Dewatering plant –solution differ between South America and Australia?	To be able to customize value propositions according to country-specific differences.

The *first research question* aims to find out how customers make purchase decisions of complex offerings, such as bundle of products and services, or solutions. The objective is to gain a better understanding of the customers' buying behavior and what kinds of things are affecting the purchase decision. The purpose is also to understand the customer's purchase process, so that suppliers could better serve customer's emerging needs throughout the process.

The *second research question* examines what kinds of features are important for customers during different phases of solution lifecycle. It concentrates on identifying the value adding features, so called add-on benefits that really delight the customer and create additional value for them. The aim is to create new insights for value propositions and deliver superior value according to the findings.

The *third research question* is related to the customer value as well, but it aims to identify the differences of customer value between the two different market areas. The purpose of this question is to identify if there are any cultural or geographical factors that influence on the customer value perceptions. As a result, Outotec should be able to better adapt to local requirements.

1.2 Research structure

In this section the research structure is described. This master's thesis consists of 6 chapters including introduction. After introduction there is a theory chapter, which is related to the topic of this thesis. In the rest of the chapters research methodology is explained, findings are analyzed and results are presented. The research structure is presented in input-output table in Figure 1.

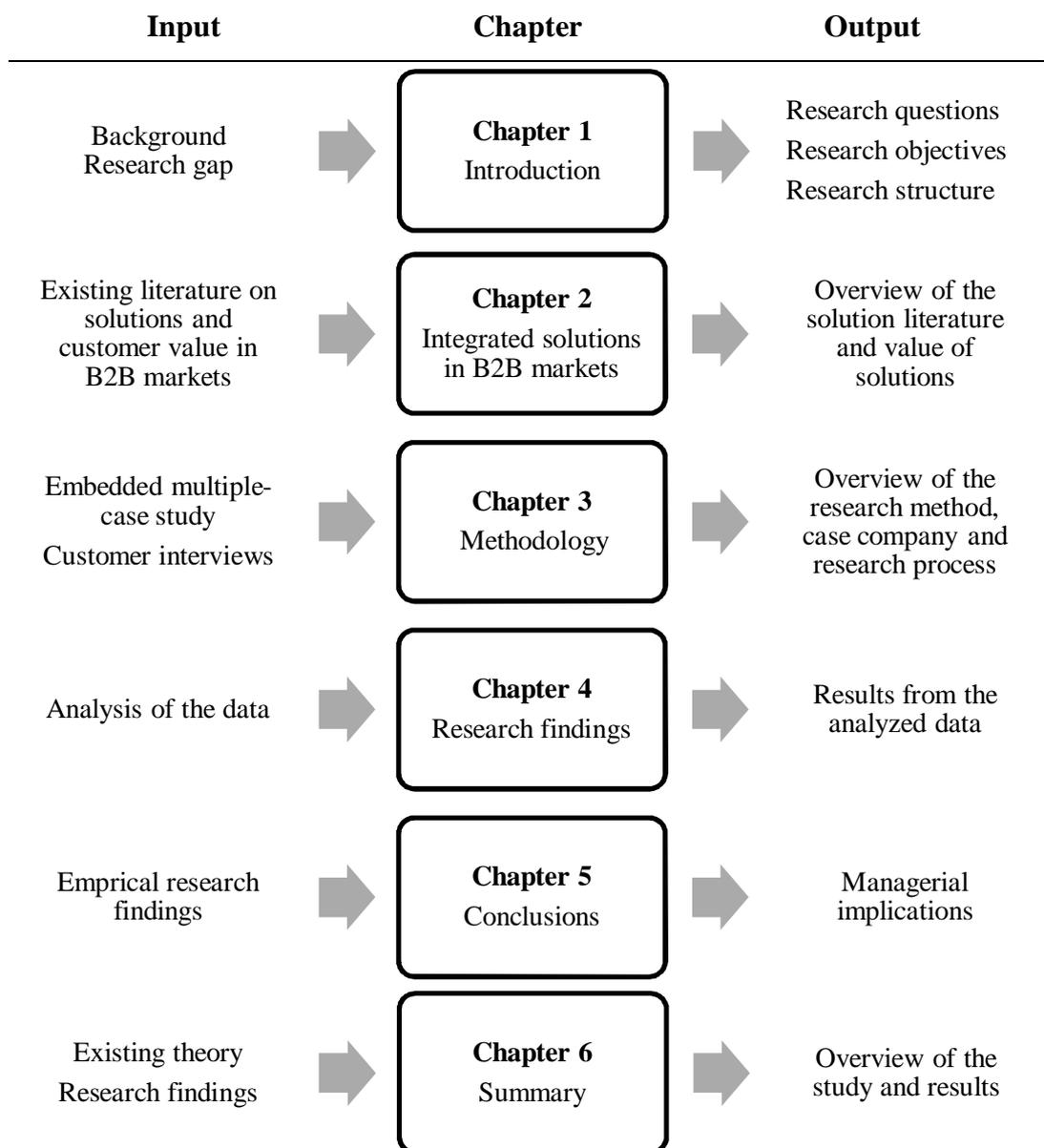


Figure 1. Structure of the study.

First chapter is the introduction of the study, which describes the background of the study and the research gap in the present research literature leading to the development of the research questions and objectives. In addition, the structure of the research is presented.

Second chapter is the theory part of the study. First, the concept of solution in B2B market is explained following the overview of how complex solutions are purchased in the industrial markets. After that, the distinction in how suppliers and customers view a solution is compared and as a result of that the customer's perspective on solution is presented. Finally, the value derived from integrated solutions and the cultural differences affecting the perceived value are examined.

In the *third chapter* the research methodology and case company are presented. The aim of this chapter is to give the reader a short overview of the research method used in this study: embedded multiple-case study. Outotec as a company is introduced on a general level, following by the introduction of the dewatering plant solution. After that, the data collection and analysis processes are introduced. The purpose of this chapter is to give the reader a picture of the research process so that the reader can assess the validity of the study.

Fourth chapter analyzes the findings of the study. The structure of the findings follows the theory part of the present study. First, the customer's purchase process is reviewed and analyzed. Second, the customers' perceptions of value in each phase of the solution life cycle are examined, and finally, the value perceptions in South America and Australia are compared and differences are highlighted.

Fifth chapter provides the conclusions that are derived from the research findings and present literature. In this chapter the research questions are answered and managerial implications are made. There is also a recommendation for future research to be conducted. *Sixth chapter* is a brief summary of the whole study. It summarizes the existing theory of integrated solutions and what has been done and what the key findings are. In this chapter new information is not provided.

2 INTEGRATED SOLUTIONS IN B2B MARKETS

In marketing, the dominant logic of exchanging “goods” had been prevalent for centuries. It concentrated on tangible resources, embedded value and transactions. However, a new logic of exchange has been emerging for the past decades, which focuses on intangible resources, value co-creation, and relationships. The new service-dominant logic (S-D logic) is more about doing things *for* and *with* the customer rather than *to* customers (Vargo & Lusch, 2004). In the near past many companies in business-to-business (B2B) market have started to put more effort in developing services along with their core products. By doing this they ensure a steady growth and competitiveness in the marketplace (Jacob & Ulaga, 2008).

These kinds of combinations of goods and services have various terms defined by several authors. Concepts, such as, hybrid offerings (Ulaga & Reinartz, 2011), customer solutions (Tuli et. al., 2007), product-service systems (Goedkoop et al., 1999), full-service contracts (Stremersch, Wuyts & Frambach, 2001), and integrated solutions (Wise and Baumgartner, 1999) are all used more or less in the same context. Regardless of the plethora of terms, solutions are predominantly defined as a bundle of products, services, and software (Brady, Davies and Gann, 2005) that can solve specific customer problems (Sawhney, 2006). A broader view of solutions argues that customers have more process-centric than product-centric view of solutions (Tuli et. al., 2007).

Industrial companies have noticed that competition in manufactured goods is intense and mainly transactional and service business can result in higher profits and higher customer value (Foote, Galbraith, Hope, & Miller, 2001). Thus, they have moved away from supplying pure products to providing solutions. The move is more recognizable in industries where the nature of the products and services are complex and involve high risk and value (Sawhney, 2006). Companies like IBM and GE have managed to successfully shift their business focus from products to solutions (Sawhney, Balasubramanian and Krishnan, 2003). However,

the transition process of manufacturers has been quite slow and careful. There are at least three reasons for unsuccessful transition. First, companies don't believe that the offered service will increase their profits substantially. Second, the service related to the product may be out of the company's core competences. Finally, the company fails to implement a functional service strategy. (Oliva & Kallenberg, 2003)

There are several reasons why global mining industry provides an interesting context for integrated solutions. In mining industry solutions are relevant for suppliers and customers. First, suppliers have plenty of opportunities to sell solutions since customers are investing in old and new mines. Second, mining as an industry is very maintenance-intensive and production shutdowns are very expensive for customers. Hence, there is a need for solutions that reduce high maintenance costs and increase the overall equipment efficiency (OEE). Third, due to the quick expansion of the mining industry there is a lack of skilled personnel. In addition, cost of the labor and equipment is increasing. Therefore, suppliers have opportunities to develop solutions that reduce the demand for labor in order to improve the efficiency of the customer's operations. Finally, commodity prices in mining industry are quite volatile, which might encourage customers to seek more flexible and predictable solutions in terms of costs. According to analysts the imbalance of the supply and demand is the reason for the high volatility environment. (Connolly & Orsmond, 2011; Biggeman, Kowalkowski, Maley & Brege, 2013)

Solutions business is not entirely beneficial for just suppliers in terms of growing profits and closer customer relationships. Customers are also demanding more services to cover all of their business needs. In addition, more complex offerings are needed due to increased competition in the market. Solutions include everything in one seamless package and for that reason they create easier life for customers (Brax & Jonsson, 2009). Customers buy solutions in order to acquire benefits such as superior operations, cost savings, convenience and state-of-the-art offerings (Miller et al., 2002). Moreover, when purchasing solutions customers

are moving the responsibility of performing activities and risks to suppliers (Brady et al., 2005). This is very valuable especially in mining industry where the perceived risk is high.

2.1 Purchasing solutions

Research on purchase decisions has been more focused on B2C rather than B2B context (Dhar, Menon and Maach, 2004; Stremersch et al., 2003). Kivetz, Netzer and Srinivasan (2004) have studied the compromise effect in B2C market in terms of how it affects the customers' choice. Compromise effect means that the customer prefer to choose the intermediate option rather than the extreme option. Dhar, Menon and Maach (2004) have conducted a research on the compromise effect in B2B context, where buying processes can be much more complex and involve several decision makers. They recognize that a current challenge for marketers is to understand what customers really value, since customers might be unable to interpret or unwilling to tell its preferences around the purchase attributes.

Not only suppliers are growing their willingness to move towards solution business. Broader scope of service and more customized offerings are increasingly demanded by customers (Karmarkar, 2004, p. 105). Technologically complex systems are often interdependent and consist of several modules that need to be integrated seamlessly together. Buyer has to decide whether to outsource the integration or do it in-house. In addition, buyers can decide to buy all the modules from a single manufacturer, or they can construct the solution from different manufacturers' products. Literature on what drives companies to single-sourcing over multiple-sourcing in solutions context remains scarce. Stremersch et al. (2003) have found that customers' knowledge stock has a big impact on its willingness for outsourcing. Customers, who possess moderate-know-how, are more willing to outsource their solution integration than do customers with high- and low-know-how. Moderate-know-how customers also

prefer multiple-sourcing instead of single-sourcing that is preferred by high- and low-know-how customers. (Stremersch et al., 2003)

Providing solutions to customers may create added value for them by reducing customers' work and solving their issues. Therefore, it is prominent to understand the customers' purchasing criteria for solutions. Moreover, the better understanding would help suppliers to develop even more sophisticated solutions and to deliver incremental value (Töllner, Blut & Hölzmüller, 2011). This trend towards complete solutions has led to the change in how customers view the relationship with suppliers. Many clients in industrial market prefer to do business with a single source relationship. This kind of development in the market has enabled suppliers to get away from the transactional to more relationship-oriented business, which has lengthened the relationship with their customers and led to higher margins. (Stremersch et al., 2001)

Stremersch et al. (2001) have studied the buying process of full service contracts. They define full services as “a comprehensive bundle of products and/or services, that fully satisfies the needs and wants of a customer related to a specific event or problem”. This definition is in line with the general definition of solutions. Hence, it can be used in describing the purchase process of solutions.

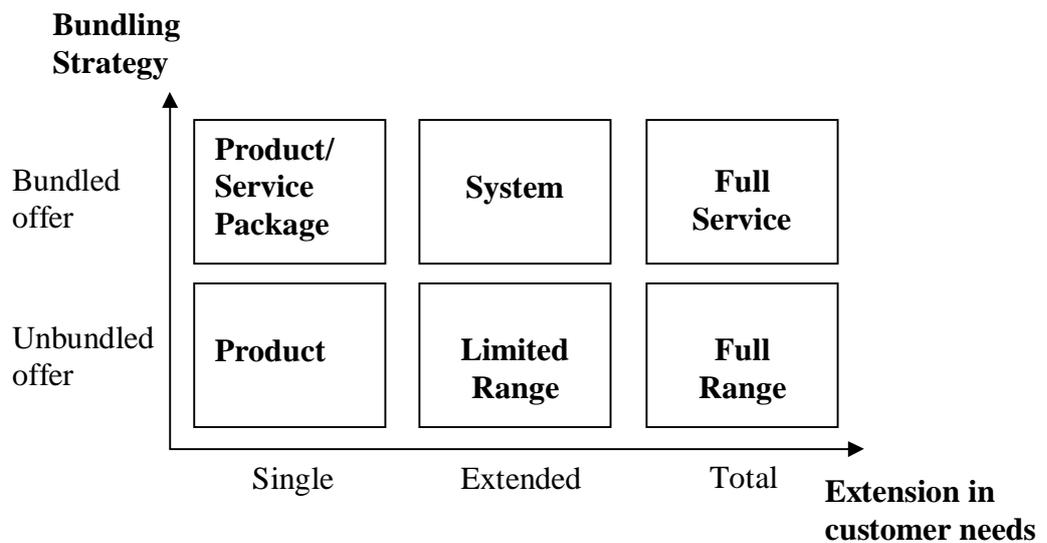


Figure 2. Concept of full service. (Stremersch et al., 2001)

Figure 2 describes the full service strategy in relation to other marketing strategies. There are two dimensions of which companies can choose to build their offerings. Full service offerings can be competing with offerings that are focusing on solving specific customer needs with bundled or unbundled offers. On the other hand, competitors can meet several customer needs by offering different unbundled offers. This approach appeals to customers who are looking for flexibility in their buying behavior. (Stremersch et al., 2001). Some customers, especially in mining industry, might not want to source all their equipment from the same vendor, since they may have favorite equipment manufacturers for specific pieces of equipment. Therefore, selling full services in mining industry could be challenging.

Due to the complex nature of full service offerings or solutions also the buying process differs from pure products. It is obvious that customers need to evaluate solutions with different criteria than single products or services. Therefore, the purchase criteria and the whole purchase process of solutions differ substantially from normal product purchasing. Intimate co-operation and high product complexity affect the importance of how the supplier should behave during the purchase process. In other words, it is essential to pay attention on how the customer is supported during the whole purchase process. (Stremersch et al., 2001; Töllner et al., 2011)

Customers' decision making unit (DMU) or the buying center in industrial markets tends to include more members and from different departments, such as operations, purchasing, financing and engineering departments, than in consumer markets (Stremersch et al., 2001). Different members in the buying center may have different preferences of the solution criteria (Dhar, Menon and Maach, 2004). For example, deciding managers in customer firms may not have detailed knowledge of how different pieces of the solution are customized and integrated into a complete solution. In order to sell solutions to customers more effectively solution providers should understand the preferences of the individual roles in the

DMU. For instance, by customizing sales material specifically for individual role's needs is a way to add value. In fact, customer-perceived value is the trade-off between various benefits and costs of supplier's offering perceived by different members of the DMU and simultaneously taking into consideration the alternative suppliers' offerings in a certain situation (Ulaga & Chacour, 2001).

To understand the customer's buying behavior suppliers need to know the different roles of the buying center. In the customer firm only a few individuals are involved in the purchase decision (Töllner et al., 2011). Buying center refers to the people who engage in the buying process for certain products, service or solution (Johnston & Bonoma, 1981). There are five roles in the buying center: users, influencers, deciders, buyers and gatekeepers. *Users* in the customer firm use the purchased product, service or solution. *Influencers* are affecting the purchase decision directly or indirectly by providing information and material related to the alternative offerings. *Deciders* are those who have authority in the customer firm to choose from alternative offerings. *Buyers* have a formal responsibility to contract with suppliers. Finally, *gatekeepers* are individuals who control the information flow into the buying center. (Webster & Wind, 1972)

In the literature different roles of the buying center have been typically linked to diverse functional units like operations, production, buying, finance, and sales (Homburg & Rudolph, 2001). Customer firm's departments, such as buying, engineering and manufacturing are seen as the most influential in the buying center (Johnston & Bonoma, 1981). Different departments and function units have distinctive preferences, and therefore, may use different criteria for supplier selection. Thus, the selection criteria depend on who the supplier is dealing with (Wilson & Woodside, 1994).

Töllner et al. (2011) have studied the purchase process in the capital goods industry. As mentioned earlier supplier's behavior during the long lasting purchase process influences the customer-perceived value. Customers choose the best solution provider by calling for bidding before making any decision. This

phase includes several in-depth negotiations with suppliers. Customers are investing huge amount of money and are associated with high risk, so it is crucial that suppliers emphasize the risk reductive factors in their value propositions such as references, experience and commitment. Since there are several competing suppliers in the bidding process, they need to constantly demonstrate their skills and competences during the early stage of the solution selling. Customers want to be sure that the supplier will be involved in the customization, implementation and operation phases of the project. Thus, the importance of demonstrating the commitment in the early stage is essential since it has a big impact on the decision making. In fact, the commitment through the whole project is seen as a decisive factor in choosing the appropriate solution provider. (Töllner et al. 2011)

Another important factor affecting the customer's purchase decision is the inter-process management, which is divided into four subcategories: 1) coordination, 2) time management, 3) incorporation and improvement, and 4) proactive support.

- *Coordination.* Customers might not be able to fully engage in the long purchasing process due to their daily business. Moreover, different customer and supplier employees participate in different phases of the solution, because of their function or role. Therefore, the coordination of the various people in each phase is challenging. A person or a team is needed for managing the interfaces of the relational processes. Customers need to focus on their daily operations, so they assume the coordination as part of the solution. (Töllner et al. 2011)
- *Time management.* Selling or buying a solution might take several months or even years. Customers trust suppliers to accomplish the different processes in time, since they are concentrated on their daily duties. The reliability of the planning in terms of schedules is substantial part of a solution. (Töllner et al. 2011)
- *Incorporation and improvement.* Solutions are complex in nature and quite often customers don't have the ability to express their requirements clearly, neither do they know about their future needs. Thus, suppliers need to help customers in the problem solving process. Suppliers are also

demanded to continuously propose new ways to improve the product in order to avoid the unexpected contingencies that quite commonly occurs in the solutions business. (Töllner et al. 2011)

- *Proactive support.* Cooperation and co-creation of the solution is highly important and extends beyond the requirements definition leading to proactive support. Customers seek trusty relationships, where the supplier shares common goals, predicts all sorts of incidents, and continuously provides advice and support. (Töllner et al. 2011)

In B2B market companies don't make purchase decisions only based on the value derived from goods and services (Reichheld & Teal, 2001). Supplier's offering can stand out from the competitors' offerings also with other factors than just technical, service, economic or social benefits. Intangible things like reputation, experience, trust, local support or innovativeness can be very valuable for a customer. Customers see also a lot of value in suppliers' future capabilities. Suppliers' ability to adjust to changes in the market can add significant value for customers (Lindgreen & Wynstra, 2005). It is noted by several authors (Coviello, Brodie, Danaher, & Johnston, 2002) that both suppliers and customers are putting more effort in managing long-term relationships, networks, and interactions. In B2B markets a lot of value is created in these relationships and more value can be drawn from the relational processes than transactional exchanges (Day, 2000). This highlights the importance of customer relationship management. Even more value can be created when the supplier and customer start to know each other and exchanges become predictable. Sometimes learning and adaptation lead to new innovations (Lindgreen, Hingley, Grant, & Morgan, 2012).

2.2 Value from integrated solutions

One of the cornerstones in B2B marketing is creating and delivering superior customer value (Lindgreen et al., 2012). Superior customer value is very tightly interconnected with the concept of integrated solution, since the purpose of it is to create more value than the individual components would create alone. Therefore,

in business markets, delivering integrated combinations of goods and services is a prerequisite for creating superior value for customers (Evanschitzky, Wangenheim & Woisetschlager, 2011). Generally suppliers try to capture a piece of this superior value by asking for a higher price from the customer. However, there is a little evidence of what really convinces business customers to purchase higher value with yet higher price. (Anderson & Wynstra, 2010)

The concept of value is used in several different contexts. Customer value considers the value that customers get from purchasing and using products and services. Typically customer value is defined as a trade-off between what the customer gets (benefits) and what the customer has to sacrifice (costs) in acquiring and using the product, service or solution (Woodruff, 1997). Traditionally customer value is claimed to be created by one party and used by another (Anderson & Narus, 2004). However, the present marketing literature emphasizes that value is created jointly with actors (e.g. Vargo, Maglio & Akaka, 2008).

Value creation is a key thing in customer-supplier relationships and it is claimed to be the “core purpose and central process of economic exchange” (Vargo, Maglio, & Akaka, 2008). Intensive cooperation between customer and supplier has received greater attention because of the knowledge intensiveness and the increasing complexity of technologies in business markets (Aarikka-Stenroos & Jaakkola, 2012). Solution co-creation refers to the interactive process where customer and supplier jointly design, create and develop the solution by integrating their resources in order to get the best outcome (Hakanen & Jaakkola, 2012). Number of studies argue that intense collaboration and communication between customer and supplier are needed for understanding the customer’s value processes and requirements, since the customer may not be able to interpret its needs clearly (Tuli et al., 2007; Aarikka-Stenroos & Jaakkola, 2012).

The components of the solution might be standardized, but normally the customer is involved in the specification and implementation of the solution. Co-production

of solution means that suppliers and customers share the inventiveness, problem solving, design and implementation (Jaakkola and Hakanen, 2013). Figure 3 depicts the basic elements that influence the value co-creation. Suppliers offer their knowledge, skills, judgment and methods, while customers provide information about their needs, goals and business in order to collaboratively create the best value-in-use. (Aarikka-Stenroos & Jaakkola, 2012)

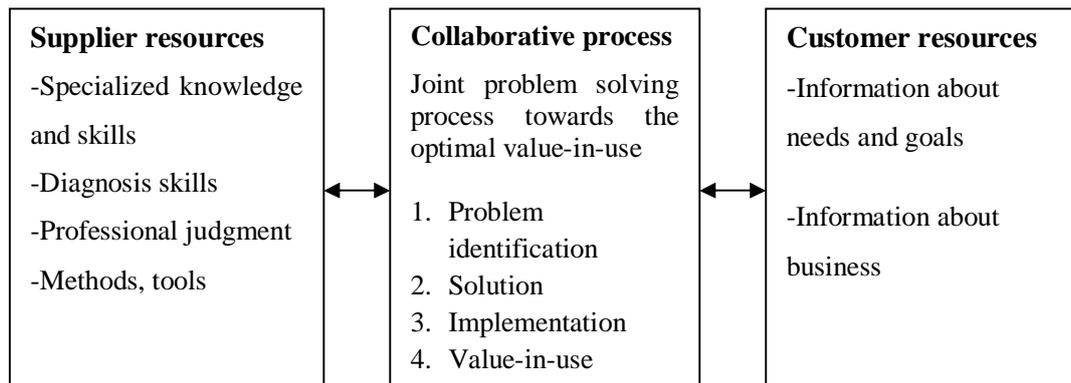


Figure 3. Framework for value co-creation as a joint problem solving process (Aarikka-Stenroos & Jaakkola, 2012)

It is increasingly emphasized that value creation requires critical information sharing and continuous communication instead of one way promotion. Suppliers and customers should express their perceptions of value and specify exactly the benefits that they expect from the offering (Ballantyne & Varey, 2006). The bigger the asymmetry between supplier's and customer's view of the solution, the more they need to collaborate (Möller & Törrönen, 2003).

However, sometimes customers don't choose the offering that delivers the greatest value, since the management of the company has decided to buy at the lowest price or the buyer's intend is to maximize its own short-term benefits. The customer might also have a long history with a particular supplier and is not willing to change it to another supplier. (Kotler, 1994)

The concept of value ambiguity is relevant in solution business. Suppliers are selling superior value to customers, but customers have a doubt about whether they will realize the promised benefits of the solution. Anderson and Wynstra (2010) have found that value evidence can be used for reducing the value ambiguity. Value evidence, such as test references and pilot programs, is a nonmonetary way of reducing the customer-perceived risk and increasing the added value (Anderson & Wynstra, 2010).

Integrated solutions create value for customers as well as for suppliers. The prerequisite in creating value with integrated solutions is that suppliers understand the customers' perspective of solutions (Tuli et al., 2007). The next sections describe the customer's view of solutions as well as the value that customers and suppliers perceive from integrated solutions.

2.2.1 The relational process view

According to Tuli et al. (2007) suppliers perceive a solution in different way than customers. Suppliers see a solution as a combination of products and services customized and integrated together in order to meet the customer's requirements better. Customer's view of solution is a set of customer-supplier relational processes, which include four phases: 1) customer requirement definition, 2) customization and integration of products and/or services, 3) their deployment, and 4) postdeployment customer support in order to meet all the customer's business needs (Tuli et al., 2007). Figure 4 illustrates the supplier's and customer's distinct views of solution.

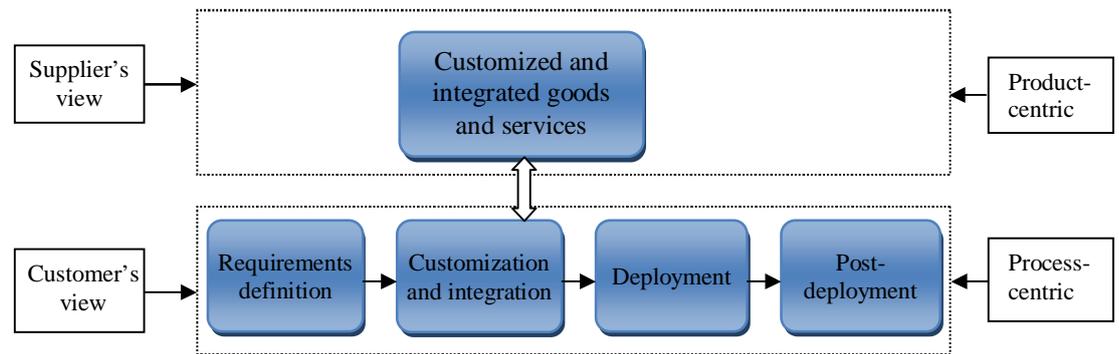


Figure 4. A comparison between supplier's and customer's view of solution. (Tuli et al., 2007)

With the help of the relational process view suppliers may be able to deliver more effective solutions and gain more profits (Tuli et al., 2007). The following four paragraphs explain the relational process model's four phases more accurately.

Customers see the *requirement definition* –phase as a key part of a solution but not so straightforward. There are at least three reasons for that. Even though suppliers are developing solutions for customers' processes, customers may not be fully aware of their real business needs. In addition, customers might have difficulties to articulate their problem to a supplier. Therefore, suppliers need to especially focus on asking the right questions from a customer and involve people from various departments from a customer firm to identify the recognized and unrecognized customer needs. Secondly, figuring out the customer needs is not just specifying the technical requirements of the product. The supplier has to also understand the customer's business, for example internal operating processes and business model. Thirdly, it is not just identifying the customer's current needs. It is also important to find out the customer's future needs and take that into account in the design of the solution. Customers appreciate the scalability of the solutions so that it will be applicable also, for example, when the customer's production increases. (Tuli et al., 2007)

Most customers and suppliers consider *customization and integration* of products and services as an integral part of a solution. Customization means that the supplier has to design, modify, and/or select products to fit into customer's environment. Integration, in turn, means that supplier needs to design, modify, and/or select products and services that work seamlessly with each other. (Tuli et al., 2007)

Deployment of products and services is seen also as an essential part of a solution by customers. Deployment –phase includes the delivery of the products and their installation to the customer's environment. During the installation there might appear new requirements that need small modifications of the products. In addition to the delivery and installation of the products, the deployment –phase includes the management of “people aspects” in a customer firm. Supplier need to understand the customer personnel's capabilities and offer them services such as training and appropriate information so that the customer will get the maximum benefits out of the solution. (Tuli et al., 2007)

Majority of customers consider *post-deployment* support as a critical part of a solution. Post-deployment is more than just offering spare parts, operating information or maintenance. It also includes developing new products for customer's evolving requirements. Consistent with S-D logic, which argues that companies should have a marketing mindset of shifting from transactions to relationships (Vargo & Lusch, 2004), solution deliveries should be viewed as ongoing relationship with a customer. Supplier must be reachable when it is needed. (Tuli et al., 2007)

2.2.2 The value of integrated solutions to customers

According to Sawhney's (2006) definition solutions include two main dimensions which are the *degree of integration* and the *degree of customization*. The first dimension, degree of integration, means that solutions are more than just a bundle of products and services. To create additional value for customers products and

services have to be integrated into a complete solution. Thus, the integration is one of the key determinants that define the amount of incremental value delivered by the solution.

There are two kinds of integration: *marketing integration* and *operational integration*. Both are essential in terms of adding value. Marketing integration is reflected in the customers' decision making and buying cycle, all the way from the presales phase to after sales. Marketing integration appears in every step that customer goes through in searching, evaluating, purchasing, delivering, deploying, servicing and maintaining bundle of products. The benefits can be seen in customers' ability to purchase all the equipment and related services from one place, paying a lump sum to a single supplier for the whole package, and managing the whole project through one supplier. Besides this, the solution needs to be operationally integrated, which means that the separate pieces of equipment need to work together seamlessly and the services are designed to support the equipment. (Sawhney, 2006)

Solutions are very often *customized to some degree*. Different customers have different requirements and needs that have to be met. Therefore, "one size fits all" solutions don't exist. Solutions should be customized for certain customer segments and even for individual customers. The degree of customization is determined by the nature of the business. As mentioned earlier, services can be customized in various ways, therefore making solutions much more amenable to customization than products (Cornet et al., 2000; Krishnamurthy, Johansson & Schlissberg, 2003; Sawhney, 2006). Solution providers create additional value by combining different products and services into integrated solutions that deliver unique benefits for the customer (Brady et al., 2005).

Providers of integrated solutions take over the responsibility and risk of activities that were previously carried out in-house by the customer, which increase the value for the customer and reduce the customer-perceived risk. Value is also delivered by suppliers' ability to combine different components into a working

whole (Brady et al., 2005). As a summary, the added value of solutions to customers occurs in more simple or superior operations, cost savings, performance guarantees, convenience, tailored service and unique offerings (Miller et al., 2002).

There are not many costs for customers in terms of solution business. However, many suppliers have failed to enter solution business profitably and therefore there is a risk that the supplier is not able to deliver a complete solution (Sawhney, Balasubramanian and Krishnan, 2003). Moreover, customer is a co-producer of a solution, and thus it is investing a lot of time, energy and resources in the development of a solution (Grönroos, 2011; Aarikka-Stenroos & Jaakkola, 2012). Table 2 summarizes the benefits and costs of solutions for customers.

Table 2. Summary of benefits and costs for customers of solutions.

Summary of benefits and costs of solutions for customers	
Benefits	Costs
<ul style="list-style-type: none"> • One stop shop (marketing integration) • Seamless operation (operational integration) • Customization of products and services enables unique benefits • Risk is managed by the supplier • Ability to focus on core business • Cost savings • Ease of operations 	<ul style="list-style-type: none"> • Supplier fails to deliver a complete solution • Time • Energy • Resources

2.2.3 The value of integrated solutions to suppliers

The transition from a traditional manufacturer company to a solution provider may require significant changes in the organizational structure, people policies, tools and processes, as well as measurement and reward systems. Solutions

usually require notable up-front investments, increased level of trust and patience, and new human resource skills and capabilities. The decision to enter into a solution business should not be taken lightly, but it should still be taken due to increased global competition and development in information technology. Solutions business provides many challenges as well as opportunities for suppliers. (Cornet et al., 2000)

According to Cornet et al. (2000) the key thing in value creation is to work with the customer and customize and integrate bundle of products, services and systems as well as commercial terms in a way that the derived value is more than the sum of the parts. Value creation is a cross-functional process which involves people from various departments from both supplier and customer firms (Cornet et al., 2000). The added value for suppliers from solutions can be seen as increased margins and profitability, extended cash flow, greater competitive advantage, opportunities for cross-selling and stronger customer relationships (Miller et al., 2002; Cornet et al., 2000). It is essential to translate value into monetary terms so that customers can clearly identify the value differences between alternative offerings (Anderson & Wynstra, 2010).

Since solutions involve provisions of both products and services, there is a greater chance for suppliers to capture more profits and gain competitive advantage. In the solution literature services are considered as real business opportunities for manufacturers. It suggests that combining products with services companies can achieve competitive advantage by meeting the customer requirements better (Davies, 2003). In solutions business, products and services are customized according to customer's specific needs, following by the delivery and implementation process as well as the after sales services (Tuli et al., 2007). Customer's increasing demand for combinations of products and services enables suppliers to broaden their scope of supply and gain more profits.

The volatility of business especially in high-cost capital industry tends to be high. There can be periods when customers don't make investments, which might lead

to decreases in supplier's revenues and work. Therefore, services over the life of the product are essential as they have higher margins and provide more stable cash flow for the supplier. (Brady et al., 2005)

As mentioned earlier, developing and delivering solutions involve high degree of co-operation between supplier and customer in order to be successful. Thus, the relationship with customers deepens and suppliers can leverage from the close relationships by learning how the customer behaves. Even more value is derived from the relationship when the customer's behavior becomes predictable. Solutions are not targeting economies of scale, but economies of repetition, which means that after developing a one successful solution for a specific customer the supplier seeks for customers with the same kind of conditions. Thus, the supplier can develop new solutions with less engineering input and gain even more profits. (Davies & Brady, 2000). Table 3 depicts the benefits and costs of solutions for suppliers.

Table 3. Summary of benefits and costs of solutions for suppliers.

Summary of benefits and costs of solutions for suppliers	
Benefits	Costs
<ul style="list-style-type: none"> • Competitive advantage • Increased margins & profits • Extended cash flow • Stronger customer relationships 	<ul style="list-style-type: none"> • Transition to solution business require significant organizational and operational changes • Notable up-front investments • New employee skills and capabilities

2.3 Cultural differences of customer value perceptions

Global markets offer opportunities as well as challenges for suppliers. The understanding of the drivers for customer value and the effects of cultural factors on value creation have become more complicated due to more open and integrated

markets. Thus, international companies must be able to adapt to local requirements. (Bower, 2005)

Market researches of what constitutes superior customer value should not be applied universally. In fact, majority of customer value research in business markets have focused on studying the construct within a specific country or region. Companies are becoming more global and seeking opportunities from all over the world by conducting market researches. The perception of superior customer value differs across the globe. Therefore, it needs to be studied and tested in different cultures. Companies, who solely translate their market surveys and value propositions into different language, will probably fail to meet customers' requirements and drive themselves to ineffective segmentation and customer relationship strategies. (Ueltschy et al., 2004; Blocker, 2011)

Customer benefits are divided into two groups: core benefits and add-on benefits. Core benefits are needed to fulfill the customers' necessities, whereas add-on benefits are usually additional benefits which help the supplier to differentiate itself from competitors. Supplier needs to be able to provide the core benefits in order to develop relationships with customers and to become a potential supplier. In other words, supplier needs to be able to deliver the product, service or solution on time in ordered quality and quantity. The differentiation from competitors requires suppliers to offer add-on benefits that go beyond the core-benefits. The concept of add-on benefit is closely related to the concept of added value, which is to provide more than just the core product or solution. Core technologies are becoming increasingly similar and companies are forced to differentiate from competitors. An add-on benefit for a solution supplier might be for example a pilot plant in customer's disposal in order to conduct risk-free tests of innovative products. Knowing how the benefit perceptions are developed in different cultures helps suppliers to differentiate in the global market and to decide on the foundation of global market segmentation. (Homburg, Kuester, Beutin & Menon, 2005)

Global competitive advantage requires companies to deliver adequate benefits for certain customers. Cultural differences influence substantially on the construction of the value proposition. Customers are more interested in the value that they receive from the solution when they buy and use it, than the technical benefits of the solution. Hence, delivering effective solutions companies need to be aware of the value perceptions of different customers in different cultures. Factors influencing the perceived benefits are market development, connection to global competitive offerings, national regulations, as well as cultural expectations. (Homburg et al., 2005)

Blocker (2011) finds in his study that customer value as a concept can be generalized across cultures. It is perceived as a trade-off between benefits and sacrifices, whereas a concept such as “satisfaction” differs in cross-cultural contexts. Also the value drivers between cultures are significantly distinctive. The value perceptions in culturally similar countries might vary remarkably, whereas in countries of totally different cultures value could be considered in a similar way. In business markets companies should be aware of the cultural differences, but also look beyond the national features, which might lead to new opportunities to standardize certain value propositions for entirely diverse market areas. (Blocker, 2011)

Therefore, suppliers should increasingly emphasize on the development of their value proposition. Since the perceived benefits can differ significantly even in culturally similar countries, value proposition should be constructed individually to each case. The following two sections explain the two substantial areas of business marketing: segmentation and value proposition in B2B market.

2.3.1 Segmentation in B2B markets

The purpose of segmentation in B2B markets is to identify customers that are like-minded and most likely to purchase your offering. As the products become more similar, the importance of customer segmentation grows. Fulfilling

customers' needs profitably is the heart of marketing. As referred above, customers' needs might differ, and thus different approaches are needed. (B2B International, 2015)

Meeting customers' needs profitably means that companies should not target on those customers who are less profitable, but rather treating profitable key customers as heterogeneous groups with distinct needs. In B2B markets it is very uncommon that even two customers have similar needs. The ideal situation would be that each profitable customer would be treated individually and their unique needs would be fulfilled. However, this would require too many resources from suppliers in order to be profitable. To conclude, segmentation is a practical tool for companies to come up with a solution that maximizes the companies' profits. (B2B International, 2015)

In practice, companies should target customers who want, need and are ready to pay for the company's offering. On the other hand, companies have to identify those who don't. The target markets and customers have to be chosen on the basis of where companies presume to have competitive advantage. Segmentation and marketing have the same fundamentals. Companies have to know their customers in terms of their differences and similarities and thus formulate a value proposition that appeals to particular customers. (B2B International, 2015)

Segmentation between B2B and B2C markets has many differences. First, the DMU in B2B markets is much more complex. The purchase decision involves several people in the customer firm and suppliers should also segment the decision makers in the customer firm. For example, engineers might have different preferences of the equipment than commercial people. Second, customers in B2B markets are more rational in their purchase decisions, and therefore easier to segment. Third, products in business markets are more complex and therefore requiring more decision makers from different departments. Fourth, the target audience is smaller, meaning that a small amount of customers constitute majority of sales (20:80 rule). Fifth, personal relationships are more

important in B2B markets, since the number of customers is low. Every customer expects to have personal service. However, companies have to evaluate customers in terms of who are willing to pay for the service, and make decisions to whom is offered premium service. Sixth, purchases in B2B markets are long-term and they usually need services over the life cycle of the product. This makes segmentation easier as it evolves relatively slow. On the other hand, companies might pay too little attention to the changing needs of a customer. Seventh, companies in B2B markets don't have to predict future trends as they have more time for evaluating the customer-perceived values. Finally, the number of needs and behavioral-based segments is lower in business markets partly due to the smaller target audiences than in consumer markets. (B2B International, 2015)

2.3.2 Customer value proposition

Customer value proposition has become a common term in business markets. Being under the pressure of cost reductions customers might only concentrate on the price of the supplier's offering and not listening to the sales pitch. Once suppliers start to understand customers, they can make smarter choices of where to allocate their resources in order to develop new offerings. (Anderson, Narus & van Rossum, 2006)

There is not an agreement of what constitutes a value proposition. Many value propositions highlight the savings and benefits *without backing them up*. A solution might in fact offer superior value to customer but if the supplier doesn't demonstrate and explain the superior value to the customer, it will probably consider the claim as a marketing fluff. The customer managers who make the purchase decisions may not believe the supplier's assertions if they are not well justified. (Anderson et al., 2006)

Anderson et al. (2006) have conducted a study to understand what constitutes a customer value proposition and what kind of value propositions are persuasive to customers. They found that suppliers use three types of value propositions: all

benefits, favorable points of difference, and resonating focus. A value proposition usually includes points of parity and points of difference. Points of parity are elements that have approximately the same performance or functionality as the second best alternative. Points of difference are features that make the supplier's offering either superior or inferior to the second best alternative. Anderson et al. (2006) present three ways to construct a value proposition. These are described below.

All benefits. Most suppliers use this kind of value proposition meaning that the suppliers simply list all the benefits that their offering delivers for target customers. They think that the more they list benefits, the better. This kind of approach requires the least knowledge about customers and competitors and also the least amount of work from the supplier to construct. It has also a major disadvantage: benefit assertion, meaning that some of the asserted advantages might create no benefits for the customer at all. Another drawback of the all benefits value proposition is that most of the benefits are points of parity with the second best alternative, weakening the effect of the couple of real points of difference. All benefits value proposition answers the customer's question "Why should our firm purchase your offering?" (Anderson et al., 2006)

Favorable points of difference. This value proposition requires knowledge about own market offering as well as the second best alternative. It clearly recognizes that the customer has an alternative. The value proposition answers customer's question of "Why should our company buy your offering instead of your competitor's?" which clearly implies that the supplier has a competitor. Suppliers need to differentiate themselves from the competitors with points of difference. Supplier's products might have several points of difference, making it difficult for suppliers to understand which ones deliver the greatest value for the customer. Without the required information of the customer, suppliers may emphasize totally wrong points of difference that deliver little or no value for customers. (Anderson et al., 2006)

Resonating focus. The best of the three value propositions is the resonating focus value proposition. Supplier needs to know how their offering creates superior value to customers, compared to second best alternative. It answers the question “What is most worthwhile for our company to keep in mind about your offering?”. The main idea of this value proposition is to present the few elements of the offering which matter the most to the target customer as well as demonstrate and communicate the superior value in a way that customer feels that the supplier understands its business priorities. More is not better. Resonating focus value proposition concentrates only on one or two most significant points of difference, which deliver the greatest value to customers. Sometimes it might include a point of parity to increase the effectiveness of the proposition. In order to create any kind of value, companies have to identify which customers to target. (Anderson et al., 2006)

According to the marketing literature, companies who have a deep understanding of customer value creation can create superior value propositions in the global markets (Anderson & Narus, 2004). Questions of existing measures and models of customer value being applicable for diverse markets still remain unanswered. (Blocker, 2011)

3 METHODOLOGY

In this chapter the research methodology and case company are presented. First, the embedded multiple-case study as a research method is explained. Next, there is a brief introduction of the case company Outotec and the dewatering plant solution. Finally, the research process is described.

3.1 Embedded multiple case study

As this study aims to gain deeper insight into the phenomenon of how customers in mining industry purchase and perceive value from complex solutions in two geographically different market areas, a qualitative case study is conducted. Case study as a research method can be used in several contexts to enlighten our knowledge of a certain under-investigated phenomenon. Case studies are commonly used in many areas of science, such as psychology, sociology, political science, business, education and community planning. It is also used in economics to study a given industry or an economy of a certain region or city. The purpose of a case study is to understand a complex social phenomenon like organizational and managerial processes or small group behavior. (Yin, 2009, p. 4)

A case study is often the preferred research method when questions “how” and “why” are being asked about a contemporary event and when the investigator has little or no control over the specific event. It is by many ways similar to other research methods, but case study can leverage several sources of evidence such as direct observation of events, interviews with persons involved in the events, archival data, as well as quantitative data. (Yin, 2009, p. 13, 19)

In this research multiple cases are examined and diverse data collecting methods are used. In some fields of science multiple-case studies have been separated as a different research strategy from single-case studies. However, Robert Yin considers single- and multiple-case studies as alternatives within the same methodological framework. Multiple-case studies have become more common in

recent years even though they are more expensive and time-consuming. (Yin, 2009, p. 53)

The investigated cases within the multiple-case study can be either holistic or embedded. In other words, a multiple-case study might consist of multiple holistic cases or multiple embedded cases. The studied phenomenon and the research questions affect whether the design of the study is holistic or embedded. Figure 5 depicts the idea of both types of multiple-case studies. An embedded multiple-case study involves subunits in each case.

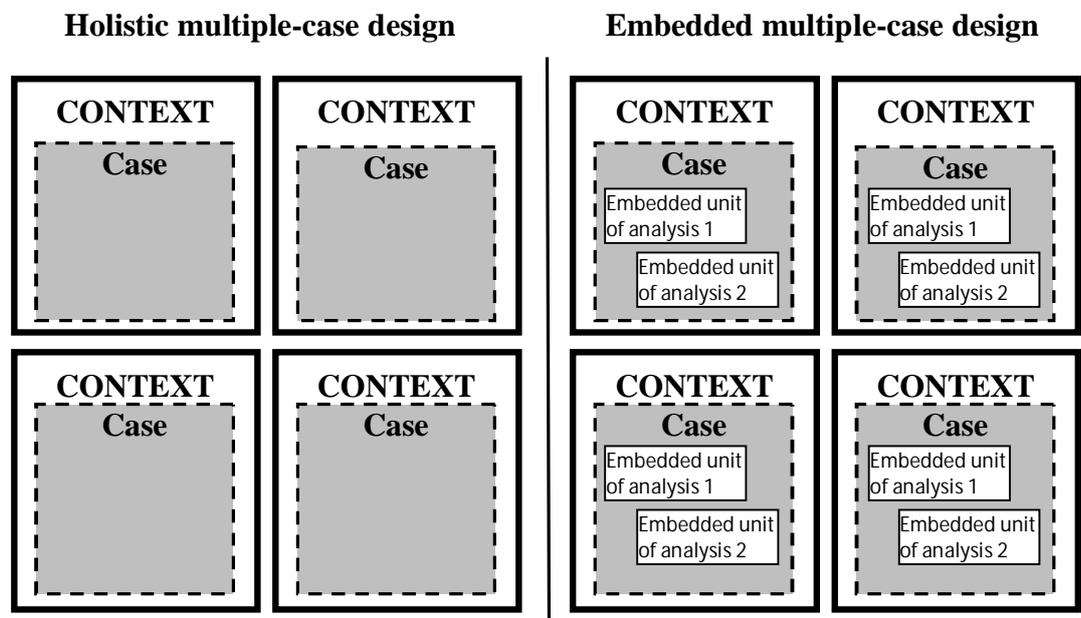


Figure 5. Types of multiple-case designs (Yin, 2009, p. 46)

In this study embedded multiple-case study is employed and two cases were selected under investigation. The selected cases are two different market areas, in which different types of customers, end customers and engineering companies, are examined. Multiple-case studies have both advantages and disadvantages compared to single-case studies. Multiple-case studies are considered being more compelling and therefore the overall results being more robust. However, multiple-case studies require significantly more time and resources of a single research investigator. In the present study enough resources and time were

available, and therefore multiple cases were able to be examined. Next sections describe the case company, explain the research process of multiple cases and present the data collection methods.

3.2 Case description

This research has been done in close collaboration with Outotec that operates in the mining and metallurgical industries. Outotec enables to conduct this study by providing access to customers in mining industry. Outotec has been developing a new dewatering plant solution for the past three years, which has aroused remarkable interest among customers in the market. Therefore, Outotec wants to enlighten its knowledge of how customers perceive value of the dewatering plant solution.

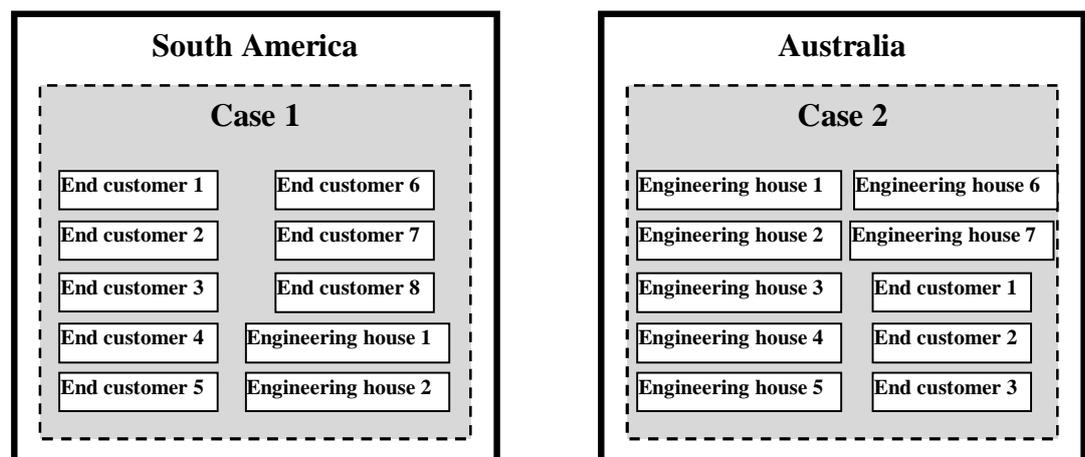


Figure 6. Embedded multiple-case design in this study.

Figure 6 presents the embedded multiple-case design of this study. As can be seen from the figure, the two cases consist of slightly different embedded units. Both cases are explained more accurately in section 3.3. Next, there is a short overview of Outotec as a company and after that the dewatering plant solution is described more specifically.

3.2.1 Outotec

Outotec is a global leader in the minerals and metals processing technology with its main value of sustainability. The core of its business is to find the smartest value from natural resources and to create the most sustainable solutions for water, energy and minerals. Outotec offers the full value chain from ore to metals in two business areas: Minerals Processing (MP), and Metals, Energy & Water (MEW). This master's thesis focuses on the minerals processing business area which develops sustainable mineral processing solutions from pre-feasibility studies to complete plant solutions and services for the entire lifecycle of the solution. At the moment Outotec has sales and service centers in 27 countries and six continents and employs almost 4900 employees. (Outotec, 2014a; Outotec, 2015a; Outotec, 2015b)

Outotec is headquartered in Finland, but it operates globally, selling products and services to over 80 countries (Outotec, 2015e). Outotec's operations are divided into three regions: the Americas, Europe, the Middle East and Africa (EMEA), and Asia Pacific (APAC) (Outotec, 2015b). Table 4 presents Outotec's sales by region in 2014 and 2013.

Table 4. Sales by region. (Outotec, 2014a)

Sales by region	2014	2013	%, 2014	Change
EUR million				
Americas	809.2	1,038.5	58	-22.1
EMEA (including CIS)	327.0	508.0	23	-35.6
APAC	266.5	365.1	19	-27.0
TOTAL	1,402.6	1,911.5	100	-26.6

This study concentrates on the Minerals Processing business area. MP business area consists of six business lines: Concentrators, Comminution, Flotation, Dewatering, Services, and Operation & Maintenance (Outotec, 2015a). The focus of this study is on Dewatering business line as illustrated in Figure 7.

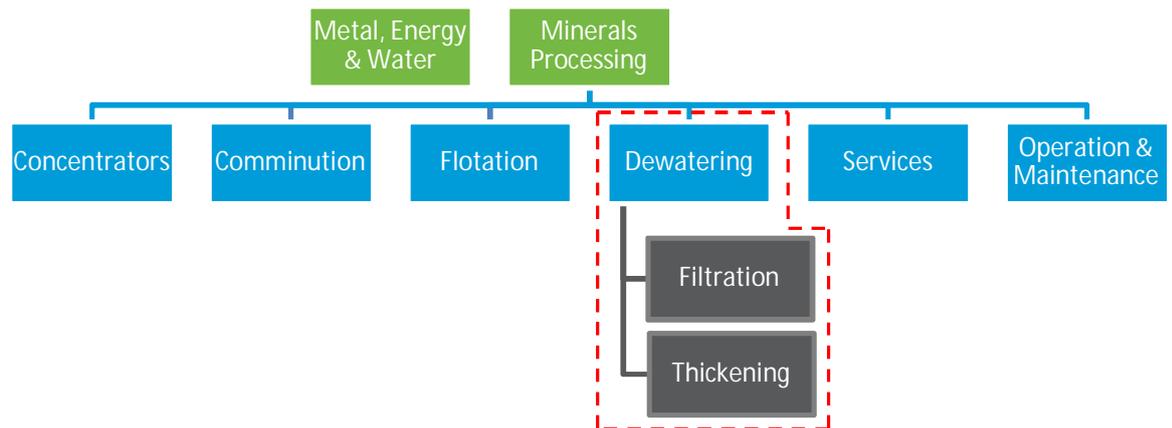


Figure 7. Focus of the study.

A complete dewatering plant can include several different processes and equipment, but the main processes in are thickening and filtration. Next section describes the dewatering business line and its sub-processes more accurately. In addition, the dewatering plant -solution is introduced.

3.2.2 Dewatering plant solution

Dewatering is part of the value chain from ore to metal. The first process in the value chain is the comminution, which includes equipments such as crushers followed by grinding mills and classifiers. The second phase is the concentration which consist of pieces of equipment such as separators, flotation cells and analysers. However, these are not explained more explicitly, because the focus of this study is the dewatering phase. Figure 8 illustrates the full value chain, in which the dewatering phase is marked with dashed line.

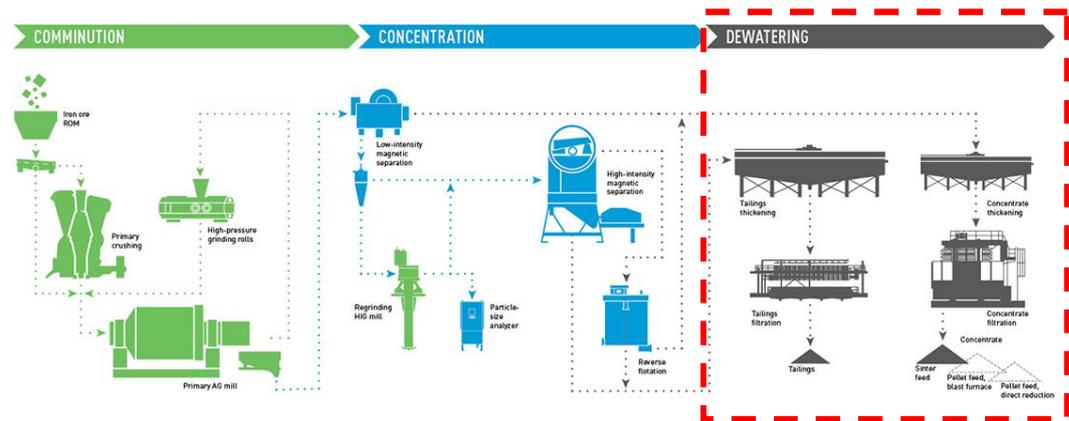


Figure 8. Full value chain from ore to metal (Outotec, 2015c)

Dewatering business line consists of several pieces of equipment but the main processes are filtration and thickening. Dewatering is a physical operation, which aims to separate solid and liquid from each other. Both concentrates and tailings can be dewatered and the water can be recirculated back to the process which reduces significantly the use of raw water. Usually the separation process involves products like thickeners and filters in order to achieve an effective outcome.

The dewatering plant -solution is relatively new concept in Outotec's product portfolio. With its modularized and scalable structure Outotec aims to offer specified solutions for concentrate, tailings and water management. The purpose of developing dewatering plant -solution is to support customers with more efficient and reliable solution as well as to improve safety and to lower the total cost of ownership. (Outotec, 2015d)

Dewatering plant is a combination of different plant units. These are filtration plant unit, thickening plant unit, chemical dosing unit, cake handling, conveying and concentrate storage unit, raw water plant unit, and water treatment unit. Each plant unit contains different products and components and Outotec provides services from spare parts to full operation and maintenance of the dewatering plant. The dewatering plant with different plant units is shown in Figure 9. (Outotec, 2014b)

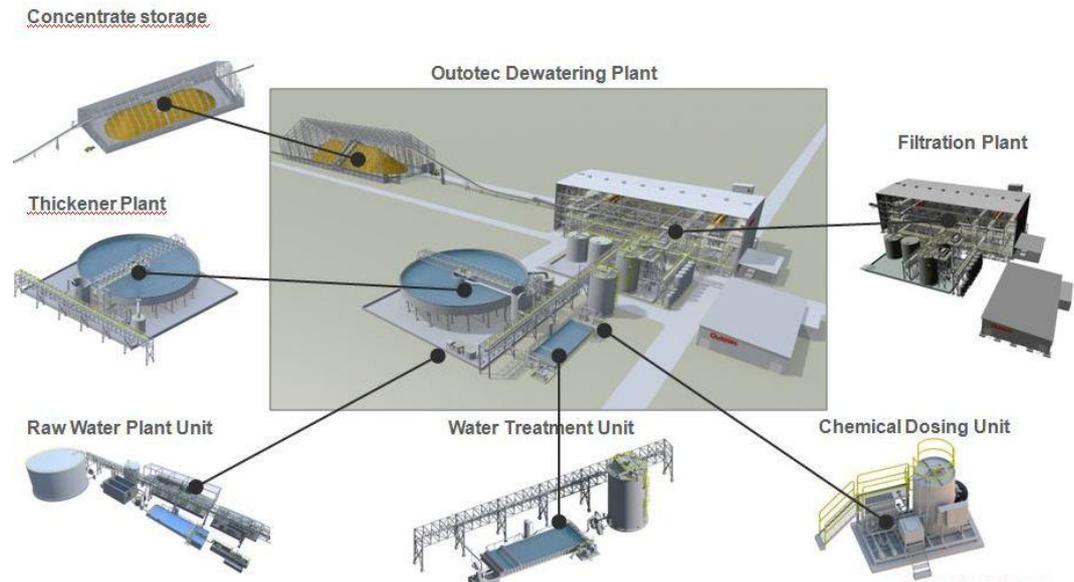


Figure 9. Dewatering plant with different plant units. (Outotec, 2014b)

The study is framed to address Outotec's Dewatering -business line customers. However, water treatment, which is part of the dewatering plant solution, is not taken into consideration in this research. The focus is not on junior plant customers who don't have solvency, nor on the large mining customers, who have their own engineering expertise. The targeted customers are between junior customers and large mining customers, who have their own financial backing but also the need for assistance. The customer needs might vary between different applications. This study is framed to include copper and iron concentrates.

3.3 Research process

The present study is conducted as part of the RIVIS –research project, which began in the early September in 2014 with a meeting at Outotec. The study was planned to be finished in the early spring in 2015. Given the issue of how customers' view of solution differs from the suppliers' view and the uncertainty of the value that customers perceive from solutions have driven companies to conduct more research on customer values in industrial markets.

In this study the data was collected through interviews and by participating in customer meetings as an observer. A total of 20 in-depth interviews were conducted with Outotec's existing and potential customers in two different continents in order to better understand the customers' purchase process and perceptions of value. In addition, one respondent sent written answers to the questions. Also secondary data was used to strengthen the findings of primary data. The interviews were semi-structured and the questions were mainly built around the phases of the Tuli et al. (2007) relational process model. All the questions were open questions and the interviewee had a possibility to answer freely.

First, several questions were asked about purchasing solutions. Second part of the interview structure included questions that aimed to identify the value adding features, as well as challenges in each phase of the solution life cycle. At the end of the interviews, there were more specific questions about Outotec. However, the interviewees did not always have enough time to answer all the questions. In that case only the most relevant questions were asked.

South America is an important market area in terms of dewatering and therefore it is essential that Outotec has a good understanding of customer value perceptions from there. Ten interviews were conducted in South America, including five interviews in Peru and five in Chile. In five of the interviews a translator was needed, because the interviewees did not speak English. This meant that one employee from Outotec was present during the interview. That might have had an impact on the respondent's answers. Out of ten interviews in South America, two interviewees were from engineering companies and eight were end customers.

In Peru, the interviews were organized in a way that first Outotec had a customer meeting, where they presented and marketed their dewatering plant -solutions and technologies to the customer. After the meetings the customers were asked to participate in the interview. Not every customer had time for the interview, but most of them did. However, those who agreed to be interviewed had only a

limited time for the interview, so all questions weren't able to be asked. Valuable data was also managed to gather from the Outotec customer meetings as a participating observer.

In Chile, Outotec had arranged separate meetings for the interviews. The time reserved for the interviews changed between 30 to 60 minutes. All the interviews were managed to be done within the time limits. The interviews lasted from 22 minutes to 59 minutes.

Another important market area for Outotec's dewatering business is Australia. During the two weeks period in Brisbane and Perth 10 interviews were conducted. Engineering companies as well as end customers were interviewed since both are important customers for Outotec. Seven of the companies were engineering companies and three were end customers. In addition to the interviews, one end customer sent written answers to the questions. Also secondary data from Australia was available and used for strengthen the primary data. Similar interview structure was used and no translator needed. The interviews lasted from 24 minutes to 64 minutes. Table 5 lists all the primary and secondary data that was used in this study.

Table 5. List of interviewees.

<u>Market area</u> Title	<u>Company</u> <u>type</u>	<u>Market area</u> Title	<u>Company</u> <u>type</u>
<u>South America</u>		<u>Australia</u>	
Project supervisor	End customer	Design Manager	Eng. company
Chief metallurgist	End customer	Procurement Manager	End customer
Manager, Process Engineering & Study Manager	Eng. company	Manager – Process	Eng. company
Chief Metal Engineer	End customer	CEO & General Manager – Technology	Eng. company
Process Engineer & Metallurgical Engineer	Eng. company	Project Delivery Manager	Eng. company
Senior Process Metallurgist	End customer	Principal Process Engineer	Eng. company
Senior Process Engineer	End customer	Project Engineer	Eng. company
Senior Process Metallurgist	End customer	Project Manager	End customer
Metallurgist Engineer	End customer	Process Engineer	Eng. company
Civil Engineer Metallurgist	End customer	General Manager & Engineering Project Manager	End customer
		Written: Principal Metallurgist	End customer
-		Secondary data: Commissioning Manager Corporate Metallurgist Project Manager Group Consulting Mech. Engineer Group Metallurgist Group Procurement Manager	End customer

4 RESEARCH FINDINGS

In this chapter the empirical part of the research is presented and the gathered data from two different market areas are analyzed. This chapter consists of three parts. First part describes the purchasing process of a solution from the customer's point of view. The purchase process does not differ significantly in the two market areas, so there is no need for analyzing the purchase processes separately. However, there are two distinctive ways to purchase solutions, which are described more precisely in the following sections. In the second part of this chapter the customers' perceptions of value are analyzed in each of the four phases of the solution life cycle in both market areas. Finally, the main differences of the customer-perceived values between South America and Australia are described.

The respondents in the interviewed firms were mainly engineers, who decide on the technical features of the solution. Thus, they can be categorized as influencers in the DMU, who can affect the purchase decision by recommending the best solution in their opinion in terms of technology. This might have also had an influence on the results of the customer-perceived values.

4.1 Purchase process of dewatering solutions

South America and Australia are considered as very important market areas for Outotec and especially for dewatering plant -solutions. There are two ways of buying and selling solutions. Traditionally, the purchase process includes three actors: supplier, engineering company, and end customer. However, there can be seen a growing trend, especially in South America, that customers are starting to avoid engineering companies and buying directly from suppliers. This is because suppliers are moving towards selling complete solutions and becoming more like engineering companies. Thus, customers are able to get the same service from suppliers as well. In fact, Outotec's goal is to become a solution provider in the area of dewatering in order to get access to bigger projects, and therefore gain

more profits. Figure 10 illustrates the two ways of buying complex industrial solutions in mining sector.

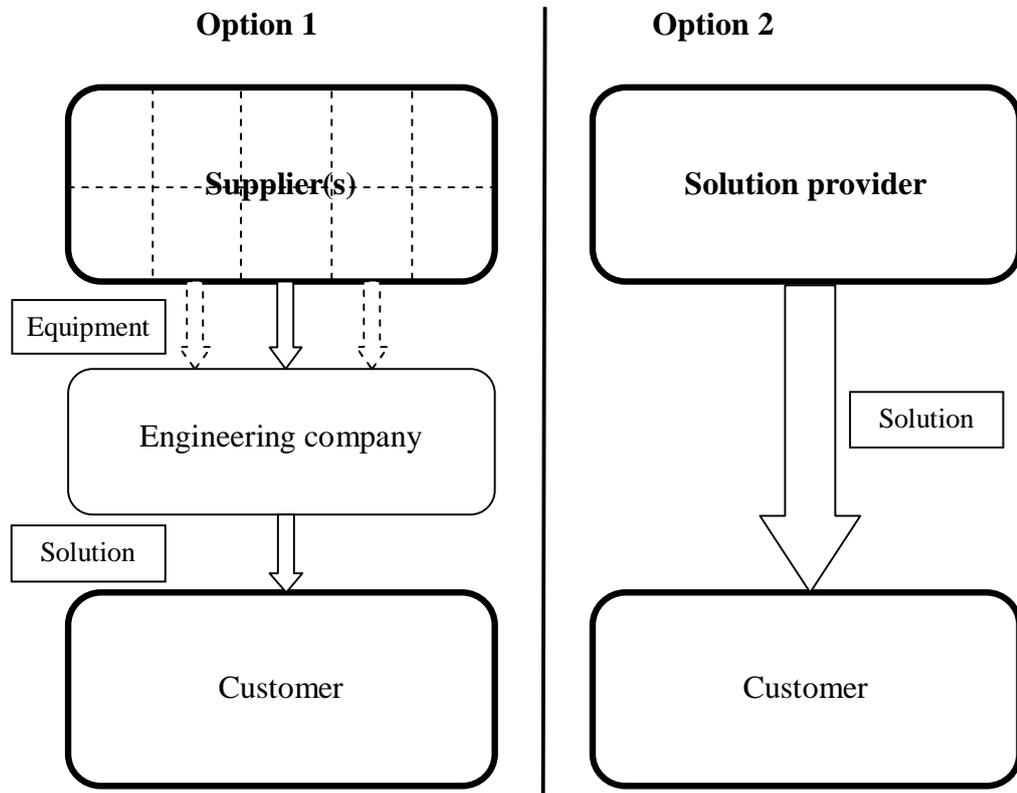


Figure 10. Two options for the purchase process.

The first option involves the engineering company between the customer and the supplier. In this option, the supplier or suppliers deliver only pieces of equipment and the engineering company is responsible for integrating them into a total solution, which is then delivered to the customer as a one whole package. The possible amount of suppliers is demonstrated with dashed line. Sometimes there can be only one supplier who is able to deliver all the products needed for the solution, but in that case the engineering company is still responsible for the integration and implementation of the solution. However, traditionally there are several suppliers involved, who deliver the required products and the engineering company has to design and engineer how to make the products fit together. So far, this has been the traditional way of delivering solutions.

Option 2 reflects the growing trend of creating added value by delivering complete solutions. In this option, there is only one supplier that can be called also as a solution provider. The solution provider is in charge of the whole project management including engineering, manufacturing, delivery and construction of the solution. In addition, the solution provider is also responsible for supporting the customer throughout the solution lifecycle. In other words, the solution provider can be considered as a one stop shop for the customer, where the customer can get everything it needs, including the services.

At the moment majority of customers use engineering companies for purchasing complex dewatering solutions. Since Outotec is pursuing to become a solution provider it is necessary to understand why end customers prefer to involve engineering companies in the purchase process. According to the gathered data there are several reasons for that. When the customer doesn't have the required human resources to do the designing and engineering of the solution by itself, they reduce the perceived risk by passing the work to engineering company, who has the *knowledge of different topics*. The solution requires evaluation for example from electrical, structural, instrumental, mechanical and financial points of view. These capabilities are normally possessed by engineering companies. In addition, a solution in mining industry usually includes several pieces of equipment and customers always have their favorite equipment suppliers due to their good and bad experiences in the past. Using engineering companies in between enables customers to choose, for instance, their favorite thickener and filter suppliers, whereas purchasing all the equipment from a solution provider, such as Outotec, customers would be forced to use Outotec's equipment.

Usually large mining companies (end customers) have their own engineering know-how and they don't need engineering companies' expertise in the evaluation and purchase process. In these cases, the end customer does as much of the engineering work as possible by itself and passes critical work to the supplier. The

customer is dependent on the information from the supplier in order to to the engineering.

Since the concept of being a solution provider is relatively new phenomenon, the general assumption among many customers is that there are not yet real solution providers in the market, who are capable of delivering, for instance, whole dewatering plant solutions. Customers presume that suppliers' knowledge is limited into very specific area, for example filters and filtration. They think that suppliers have know-how only about the products' technology and processes, which is not enough to convince customers to purchase the whole dewatering plant from a single solution provider. The biggest concerns in the delivery of dewatering solutions by the suppliers were related to designing and constructing the required buildings around the equipment. It is not necessarily considered as suppliers' task. Customers prefer it to be done by another party, whose core competence is designing buildings for industrial purposes. As one Australian end customer explained:

“You can probably work out the steel, assuming where the steel comes from, you can give me a supply price, but when it comes to installation, if you have no track record in installation, you can't give me an accurate construction cost. In any project maybe the greatest risk is in construction.”

One of the biggest challenges in the engineering and design occurs in the tie-in points, which are the connection points for different equipment to be attached together into a complete plant. If the dewatering plant solution includes different suppliers' equipment, there is a greater chance that problems will occur during the integration and installation of the different pieces, since they are not originally designed to fit together. To be capable of making several pieces of equipment work together, it will require a broad engineering knowledge about how the pieces of equipment are connected with each other. At the moment, some end customers still think that there are no solution providers in the market who have this kind of comprehensive knowledge and therefore are not able to deliver complete

solutions. As the Engineering Project Manager and General Manager in an end customer firm described:

“You’ve got to convince the client that you’re not only manufacturing company but you’re also an engineering company and a construction company, it may not be a good business model.”

“If you had a track record, if you had your own engineering house that it could be demonstrated to us that you have covered all disciplines, your systems, your procedures, all up the scratch and that you’re effectively an external engineering company capability within Outotec, call it Outotec engineering solutions if you want, then we would be more comfortable in giving you a full scope work including design and construction, but you’re not there yet, no one is there yet..”

However, sometimes things like tight schedule or a large number of suppliers who are capable of delivering what the customer is asking for may lead to avoiding the involvement of an engineering company in the purchase process. Tight schedule relates to the fact that engineering companies are using hour-based pricing model. It may be one of the factors that they do not tend to rush with the projects which they are awarded for and it also might mean that they are expensive. Alternatively, if the customer has many suppliers to choose from, they will have a better chance to find a capable supplier who can deliver what is required.

Sometimes customers are willing to try new technologies or need solutions that engineering companies might resist since they are not experts in that particular area and customers don’t want to spend time and extra money on them to become experts. This is also a factor that pushes end customers with innovative mindsets to purchase solutions directly from suppliers. However, the technologies in the area of dewatering are quite well known in the mining industry. Thus, those who contact directly with suppliers have their own expertise and do a lot of the work by themselves in order to save money. Moreover, they think that the suppliers are

still more equipment suppliers than solution providers. As one Australian Principal Metallurgist in an end customer firm mentioned:

“We are one of the first mining companies who turned to equipment suppliers for securing plant solutions after our not so happy experience with engineering company. We didn’t see value for our money but then the equipment suppliers have yet to mature in terms of their solution capabilities and get out of the equipment supply mindset. We now prefer to piece our own solution buying the equipment we need.”

Figure 11 depicts the two paths to purchase solutions and summarizes the factors that drive customers to purchase from engineering companies or from solution providers, such as Outotec. It also illustrates the information flow between involved actors. As can be seen, there is much more adjustment when the engineering company is involved. Usually, this kind of settling between actors is time-consuming and creates more misunderstandings. In fact, according to the gathered data many respondents from engineering companies mentioned that the mutual understanding between customers and suppliers is one of their biggest challenges.

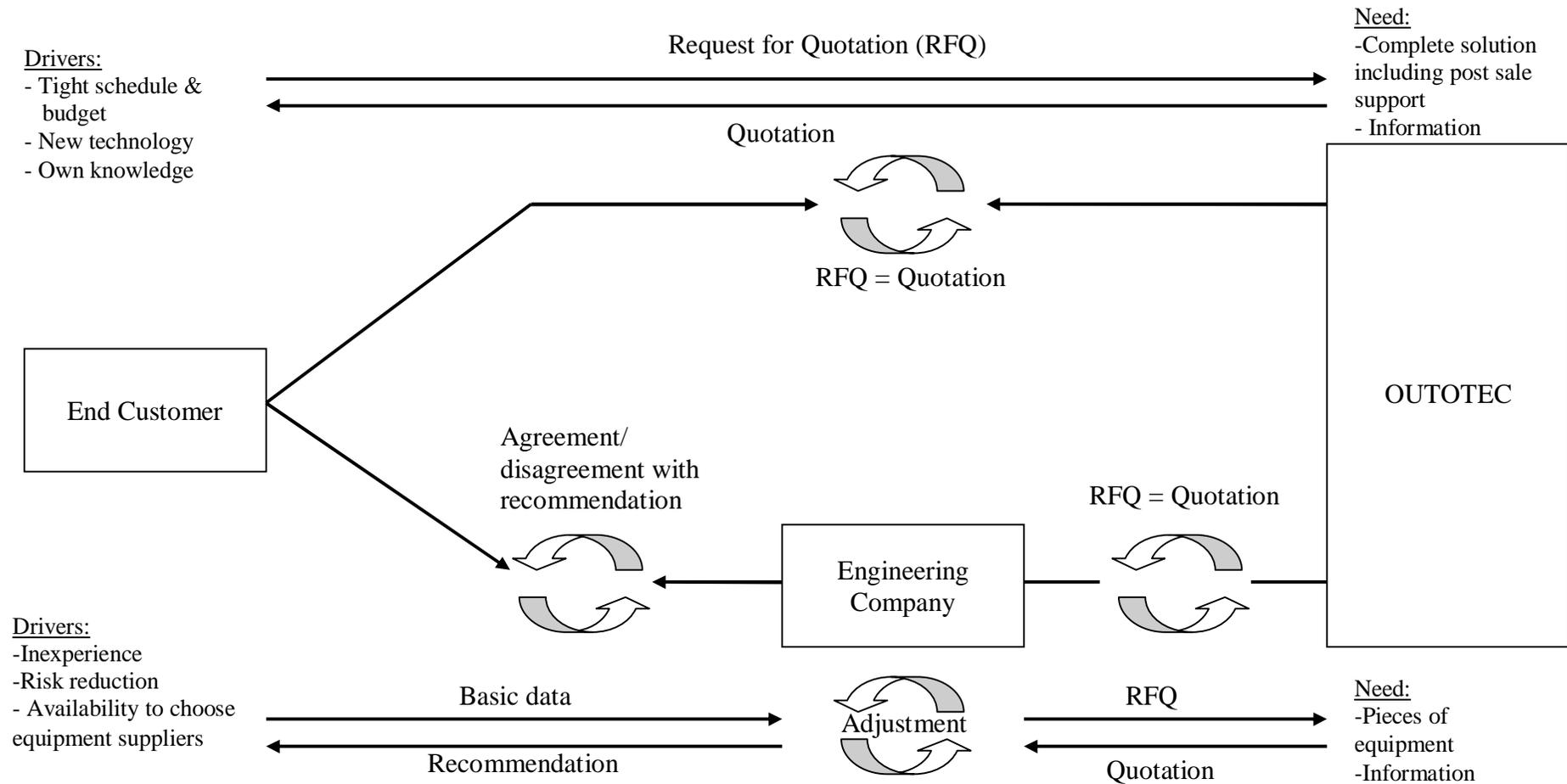


Figure 11. Criteria for choosing an engineering company or a solution provider.

The next section describes how customers and engineering companies evaluate alternative suppliers' offerings. In other words, the logic of how customers end up choosing a certain solution is presented.

4.2 Evaluation of alternative suppliers

There are two paths for end customers to choose from when evaluating alternative solution suppliers. As discussed in the previous sections end customers can engage engineering companies in the evaluation process or conduct the evaluation by themselves. The goal of the evaluation process is to find the best suitable solution for the specific case that creates the most value for the customer itself with the minimum risk. The process can last even several years and decisions are not made lightly.

Depending on the end customer's internal resources and knowledge the provided data for preparing quotations varies. Some end customers are able to define a very accurate scope of supply, whereas others are able to provide only the basic data. The less the customer has its own knowledge the more support is needed from either engineering company or supplier.

Engineering companies or end customers send request for quotations (RFQ) with scope of supply and technical specifications to suppliers. When quotations come back to the engineering company or the client the evaluation process begins. The quotations are evaluated from a technical and commercial point of view. If the engineering company is involved in the evaluation process there are two options in making the final decision. First option is that the engineering company is in alliance with the customer and they make the final decision together. Another option is that there is a dedicated team of technical and commercial people in the engineering company that is fully responsible for the final decision. In this option

the client doesn't usually have enough knowledge about the specific technology and they rely entirely on the engineering company's decision.

Both technical and commercial teams evaluate alternative suppliers' offerings and try to come up with the best solution. During the evaluation process there is a lot of discussion back and forth and adjustment of the proposal with the suppliers, which can be very time-consuming due to the lack of information or lack of mutual understanding. The goal is to make the vendor agree with all the client's requirements.

Suppliers are benchmarked from different aspects and some of the criteria are more important than others, and have higher weightings. Suppliers are compared to each other in a matrix of commercial and technical criteria. The best solution according to the matrix is recommended usually to higher level seniors or the project managers, who then agree or disagree with the recommendation. The final decision is very often made by the client and within a team.

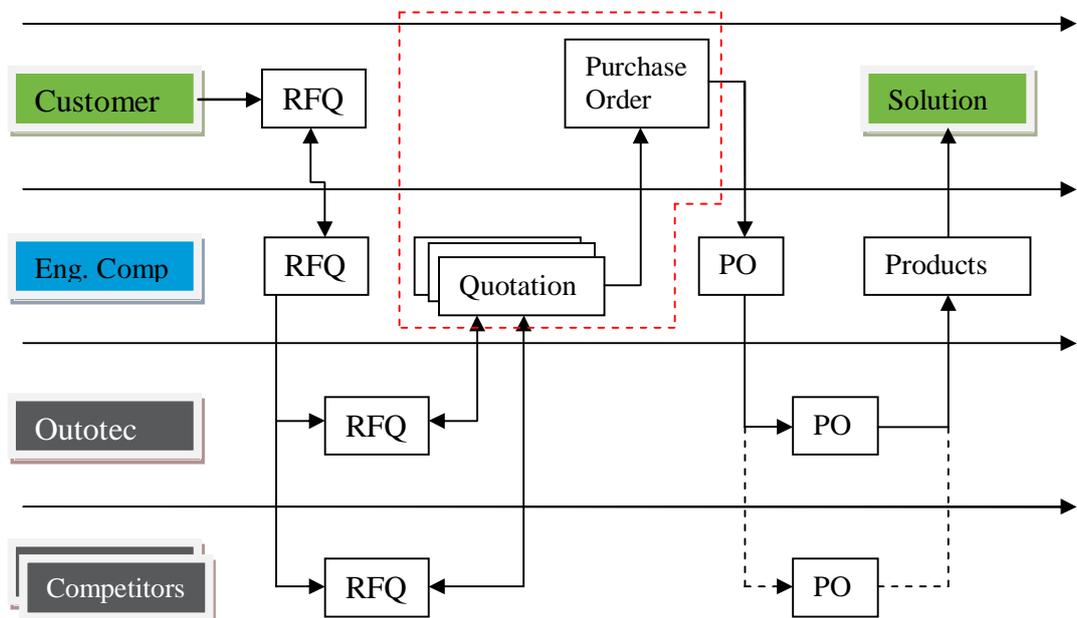


Figure 12. Evaluation and delivery process with an engineering company.

Figure 12 demonstrates the traditional buying process when engineering companies are involved. The horizontal lines represent time and the process advances according to the arrows. This example involves an engineering company and several suppliers, such as Outotec and its competitors. The process begins when the RFQ is sent to an engineering company by the client. The engineering company then reviews the RFQ and sends it forward to potential suppliers who respond to the RFQ with a quotation. Quotations are evaluated technically and commercially and the engineering company picks the best solution and recommends it to a client, who places the purchase order (PO) for the certain solution. The engineering company is responsible for the management of the PO and the involved suppliers. The purchase order might involve several suppliers, or alternatively, if one supplier is capable of delivering everything, then no other suppliers are needed. Usually when engineering companies are involved they are responsible for integrating the delivered products into a total solution, which is then delivered to the customer and installed in the customer's environment.

Competition in the mining sector is intense and suppliers have to find new ways to differentiate themselves from competitors. An essential part in the purchase process is to differentiate oneself from competitors. This part of the evaluation process is highlighted with red dashed line in the Figure 12. The second part of this study identifies the value adding features in each phase of the solution life cycle, which can help suppliers, such as Outotec, to distinguish from competitors and win more bidding competitions.

4.3 Framework for customer value perceptions

In the present literature the meaning of a solution differs between customers and suppliers. However, there are also differences among customers of what is a solution in their opinion. According to the interviewed customers, solutions are packages, which aim to solve problems. Sometimes the solution is only equipment, sometimes it includes also services. It depends case by case. Usually services are needed when the equipment is more complicated. For example, a

thickener, which is a simple and discrete piece of equipment and sits by itself, customers don't need any services from suppliers, whereas in case of a filter that is much more complex product, customers usually need advisory and support from suppliers during the whole lifecycle of the product. In this study the focus is on dewatering plant solution that includes filters and thickeners as well as other equipment.

From the gathered data the four phases of a solution can be identified. According to Tuli et al. (2007) relational process model the first phase of customer solution is the requirements definition-phase. However, this study revealed that the process of selling solutions starts way before the requirements definition –phase. The interest in the customer is evoked from the first meeting and for that reason it is justified to claim that the first phase of customer solutions can be called *presales – phase*. Presales –phase concerns a larger time frame that includes also the requirements definition phase.

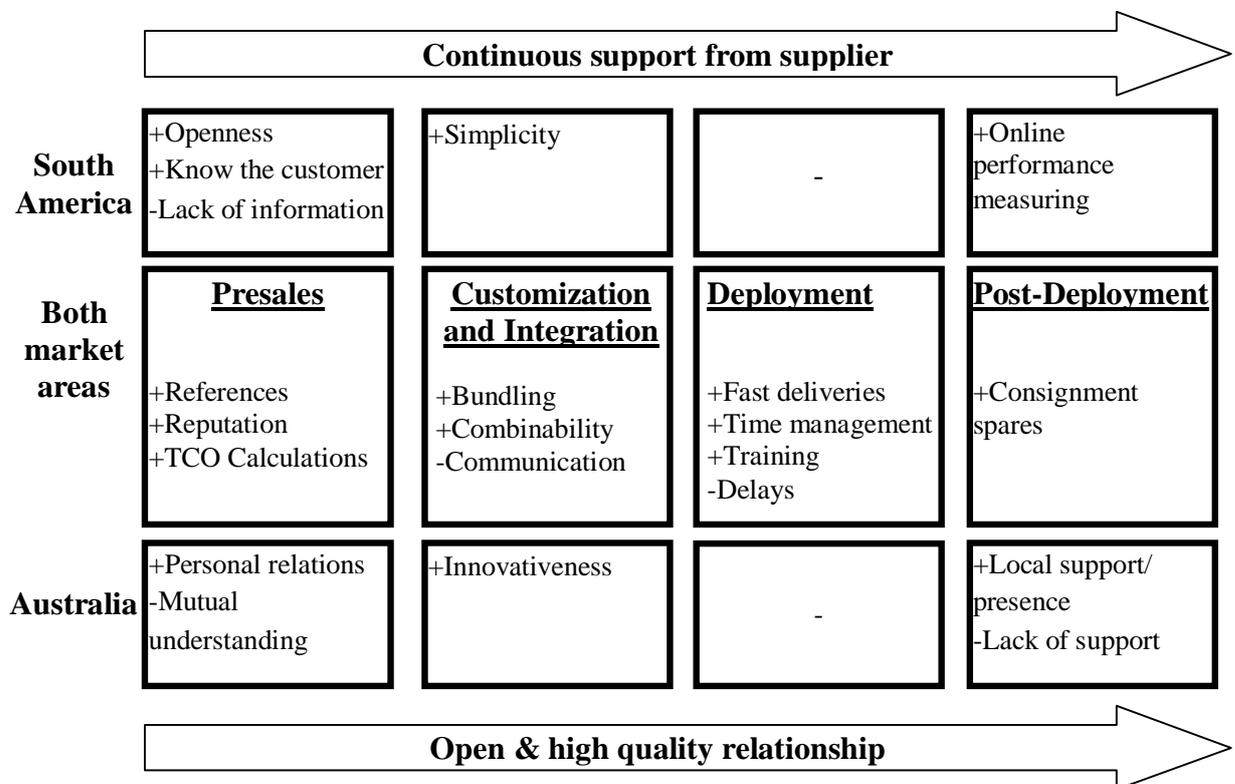


Figure 13. Customer's perceptions of value –framework.

Figure 13 depicts the four phases of integrated solutions. Each phase contains features that create additional value (add-on benefits) for customers and challenges (costs) that customers perceive. The listed add-on benefits can even be the determinants based on which customers make purchase decisions. The prerequisites (core benefits) that customers always demand are not taken into consideration in the framework. However, the core benefits are that the solution meets customer's technical requirements and fits into the customer's budget. In the presales –phase customers are weighing alternative suppliers in terms of their proposals. Customization and integration –phase includes basically the manufacturing period of the solution. Deployment –phase consist of the delivery and installation and the post-deployment phase comprises the time after the start-up and commissioning.

Nowadays and especially in the future suppliers' core products and technologies are becoming more similar and it is starting to be increasingly more difficult to differentiate with just selling pure products. Investments in dewatering business are worth tens of millions of euros and involve a lot of risks. In order to win orders suppliers need to convince customers that they are able to deliver what they promise. There are several means to convince the customers and this study aims to find out the most effective ways to lower the customer-perceived risk and to create superior value for them.

In the following sections the two market areas are analyzed more accurately. First, the similar findings from both market areas are presented. However, the reasons behind the similar value adding features might differ due to geographical divergences. Second, the distinctions in customer's value perceptions between South America and Australia are analyzed more precisely.

4.3.1 Shared value perceptions

As can be seen from the Figure 13, there are several things that have been recognized to add value in both market areas. There are also some challenges that

customers face during the different phases of the solution life cycle. However, the reasons behind the value adding features might vary between South America and Australia.

In the *presales* –*phase* references are recognized as one of the most efficient way to reduce the customer-perceived risk in both market areas. Customers want to see previous experience of similar kind of projects and how the particular technology has been performing elsewhere in equal conditions. The more identical the reference is to the customer’s project, the more effective it is. Sometimes customers can even make their purchase decision based on only supplier’s references. Customers don’t just want to see *where* the supplier’s products are operating, but also *how* they are performing. They are more into factual case studies that present the key performance indicators of a particular project. References should include information, for example, about the true operating times and life cycle costs of another mine. As an Australian process engineer in an engineering company emphasized:

“I think good reputation, good references in the market, so that you’ve got the product or whatever the solution is that you’re selling that it’s reputable system and it’s known in the market that it works. And especially the clients that we work with, they would want to see that there are other solutions or similar installed somewhere else that works. They don’t want to be the first to try the new solution”

Mining is very intense and competitive business. Customers are interested to buy the best and the most reliable technology available. However, nobody wants to be the first one to try new technologies or solutions. Everyone wants to be the first after the first one, so selling complex solutions without any references is very challenging. Outotec is in a difficult position in terms of the dewatering plant solution, since the solution is relatively new and no references of complete solution deliveries are available yet. However, Outotec is known as a reputable company and they have a lot of experience and know-how in mining industry of which customers are very aware of. Customers in both market areas think that

Outotec has very skilled personnel. They also assume that Outotec spends more money on R&D than competitors, since Outotec can provide very innovative solutions. As a summary, the brand of Outotec is seen as very strong in mining industry.

Money, especially now when the mining industry is suffering, is also seen as a major risk. After the solution has been technically evaluated it comes down to money. Engineering companies and end customers have slightly different motivations in terms of costs. Some respondents from engineering companies admitted to evaluate solutions more from capital cost point of view; whereas end customers tend to be more interested in the trade-off between capital expenditure (CAPEX) and operating expenditure (OPEX). Anyhow, engineering companies are working for the end customers and at the end of the day the client decides to approve or reject the engineering company's recommendation of the solution. Therefore, it is essential for suppliers to clearly demonstrate the total cost of ownership (TCO) of the solution for the customer. Customers want to know the balance between CAPEX and OPEX over a long period of time. Especially for Outotec, whose products are considered to be expensive in terms of CAPEX, it is even more crucial to demonstrate the total cost of ownership (TCO), so that the customer can clearly see the efficiency of Outotec's equipment in terms of low OPEX. High capital cost of Outotec's products is seen as a problem for many customers. Even though customers are aware that Outotec offers high-quality solutions they need to be convinced that they get value for their money. Providing a simple figure of TCO calculations of the solution will also help customers to compare alternative solutions with each other in terms of costs.

In the *customization and integration* –phase the most value adding feature is the supplier's ability to bundle different pieces of equipment together and integrate the pieces into a total solution. It also helps customers to manage the project, since all the services can be provided by single supplier. Moreover, customers save money on engineering and procurement, which can often be very expensive. Even if customers don't want to buy the whole solution from one supplier, the

supplier's ability to understand what happens in the upstream and downstream of the dewatering process adds a lot of value. Basically this means that the supplier needs to have knowledge of thickening and filtration and how those two processes work together. It will also lower the customer-perceived risk, since the customer is more confident that the supplier will deliver a functional solution. The respondents also mentioned that combinability across all the components of the solution would simplify their work and create additional value. If the different product components, for example pumps, are from the same manufacturer it facilitates the work of plant operators to maintain the pumps, since they need to master only one manufacturer's pumps, and also the amount of needed spare parts is lower. The biggest challenges during the manufacturing are related to the lack of communication. Suppliers need to inform customers throughout the manufacturing process so that the customer is aware of any problems that can lead to changes in the delivery schedule.

In the deployment –phase the biggest challenges, as well as customer value perceptions are related to delivery times and time management in general. Very often there are delays with the deliveries due to overseas transportation. Especially in Australia the delivery times are very important if the deliveries are not coming from inland. One interviewee even mentioned that the delivery time is the determining factor if there aren't any significant technical or commercial differences between alternative suppliers' offerings. On time deliveries reduce the customer's costs since the customer is able to start the production in time. And it is not just the delivery time of the main equipment, but also of spare parts and other components.

Another challenge related to time management is the ramp-up of the equipment. Ramp-up is the time period, in which the production is increased to its full capacity. In some occasions it might be a very long period of time. Therefore, advisory in the installation and training on how to operate the plant are considered very important. Training is almost always needed by the customer. Customers want to minimize the risk that if something breaks down the operators have at

least some basic level knowledge of the products and they might be able to fix the problem by themselves. When breakdowns occur, customers need to fix the problem as soon as possible, since they are losing money whenever the production is down. The need for the customer training depends on the complexity of the solution. In terms of dewatering plant solution customers will always need training in the beginning. They also need commissioning support, which means that the supplier representatives help the customer to start-up the plant and makes sure that all have been set up correctly.

In the post-deployment –phase, when the process is up and running on its full capacity the main thing is to assure that the pieces of equipment are working correctly and they are continuously producing the right amount of end product. After the commissioning, value can be added by offering spare parts, and especially consignment spares meaning that the customer has a stock of spares nearby the mine site that is owned and managed by the supplier. This kind of service guarantees that the customer has always the critical spares available with a short notice. As a summary, customers indicated to perceive most value from suppliers' ability to respond quickly to customer's emerging problems. However, the two market areas had differences in terms of value perceptions. These are analysed in the following sections.

4.3.2 Value perceptions in South America

In South America, environmental conditions of mining sites can be very challenging due to geographical locations. Also political regulations are pushing mining companies to acquire more efficient, reliable and sustainable technologies. Aforementioned location-specific challenges mean that customers have more demanding requirements and the solutions need to be customized to a high degree, which increases the risk of mistakes. Customization usually means that also more money is involved. In this section specific value adding characteristics that stood out in South America are described.

In the presales –phase customers are working with a very limited amount of information, which reflects that suppliers are hiding data from them. To be able to create a trusty relationship with customers, suppliers need to be more open. Customers are interested in hearing good, as well as bad experiences from the supplier, and what are the reasons behind certain decisions. Suppliers can show responsibility and increase trust in the relationship by explaining how they have handled the bad experiences in the past, and how they have improved their technologies to avoid incidents happening again. According to the interviewees, Outotec has been known for being very protective about certain information. In the words of a customer:

“Outotec has given us very good information, except when you have some problems with your main equipments.”

Presales –phase can be a long period of time and customers are usually in different stages of the project. Some customers’ interest is just to understand the basics of the process, while the others are more interested in details. Therefore, it is important to know the particular customer’s situation in terms of the project, so that the time is used efficiently and the supplier knows what the customer’s interests are. As one Peruvian customer summarized after Outotec’s customer meeting:

"At this stage of a study, we don't need to know details or anything, because we just try to understand what the basics, project is about. We don't care what kind of filter we put, we don't care what kind of pump or even, what the final flow sheet is, what the small details of one equipment or another is. It's completely irrelevant. When we get to the definitive feasibility study stage then you really need to understand what equipment you are talking about. And that's where you start to get into more details... They shouldn't be putting extra things in too much, because if it is extra, then why we would be paying for that? We don't want to pay for extra."

The respondents mentioned preferring to work with engineers rather than sales representatives. The most common reasons for this were the lack of trust in sales reps or that the respondents were not interested to hear about the marketing “bluff” that can be read also from the company’s website. Most of the interviewees were engineers or had an engineering background that might have affected their attitude towards sales reps.

In South America customers value simplicity in the *customization and integration –phase*. Supplier’s ability to design and manufacture solutions that are not too complicated can create a lot of value for customers. Simplicity is seen, for example, in the combinability across the equipment. Supplier’s ability to build a total solution that uses the same manufacturer’s pumps and a single programmable logic controller (PLC) can simplify customer’s operations remarkably. Simplicity in operations is seen to lower the customer-perceived risk, which is always valued by customers.

In the deployment-phase there were not any market area-specific customer value perceptions. As in Australia, there are very often challenges with the schedules and deliveries. Especially in Peru and Chile environmental conditions increase the risks of significant delays due to overseas deliveries, difficult inland infrastructure, and challenging mining site locations. Training and support is seen very valuable in South America, since customers want to be able to maintain and fix the equipment by themselves.

Since the competition in the mining industry is intense in South America and the ore grades are declining customers want to have the best technology available in order to stay competitive. Therefore, informing about upgrades or improvements that can be made to the equipment would be really valuable for customers. Also if customers are asking for improvements for certain part of the process, suppliers have to be open to receive feedback and offer their help. Some customers also mentioned that they would be really delighted if the supplier is able to measure

the performance of the process in real time. One senior process metallurgist from customer firm mentioned several things that he considers important:

“Final moisture, how can we measure it? How can we measure it online? It is nowadays quite hard to measure it online. For example, what kind of solution a supplier can give us to measure it online? For example, the thickness of the cake, time cycles, how can we shorten them? How can we save some water? How can we save some energy? All these kinds of improvements for the filter. I think all the main ideas must come from the supplier, because the supplier knows how their machine works.”

The most value in South America can be added through good service, which extends across all the four phases of the solution lifecycle. In the presales phase customers need advice mostly in the selection of the best solution, which is never a straightforward process. It involves a lot of discussion to find the technological and commercial fit between the customer and the supplier. Customers appreciate if the supplier is committed to the project by giving good service in terms of quick responses and willingness to help. Before the purchase decision the service is mostly technical support. In the customization and integration –phase the selection of the technology has already been done and the service is more or less information exchange in terms of vendor data and schedules and keeping the customer up to date. In the deployment –phase service means helping the vendor to get the processes running. It involves making sure that the plant operators are in every way capable of completing the task. Whether the service is a complete installation of the plant or just a support when problems emerge, it depends on the client. After the delivery and installation the most important task for the supplier is to offer support for the client if needed. After-sales service is one of the key features that customers evaluate when they are making the purchase decision. It also has a direct impact on the supplier’s reputation and brand. If the supplier is known for disappearing right after the start-up, it harms the brand image and affects negatively on the future sales. As a process engineering manager declared,

“Some people could sell you a solution that’s just short-term. And then you know, you are the one to figure out the problems, and you know, the true reference of quality is actually not seen at the moment you buy it, it is seen three, four, five years after, right? So that’s true quality. And for me that’s value to buy”

4.3.3 Value perceptions in Australia

Australia as a country is totally different compared to Peru and Chile. According to OECD’s (2012) Programme for International Student Assessment (PISA) the education level in Australia is above the OECD average, whereas in Chile and Peru the education level is below OECD average. See appendix 1. From cultural point of view Australia is much more like Europe than Chile and Peru.

In Australia, there is a need for complete solutions. They consider solution as an offering that exactly meets their requirements. However, many respondents indicated that the suppliers’ capability to deliver complex customer solutions still needs to mature. As one Principal Metallurgist concluded:

“We don’t believe there are any genuine solution suppliers available in the market – only packages. If we need a hole we always get a drill and we have to turn that into a hole. These packages require a lot of work further from us to be able to bring it to a stage it actually appears like a solution to our need. All suppliers invariably want to sell what they are good in not necessarily what we want.”

Majority of the respondents mentioned that a solution for them depends case by case. It depends on what their actual need is. Sometimes solutions are complete plants or plant sections like a dewatering plant. Sometimes they are only pieces of equipment. However, since the technological requirements come first, very rarely one supplier has the best suitable technology in all areas of the value chain. Some suppliers are good at flotation, others are good at filtration. All customers have their favourite filters, thickeners and float cells and usually they are not all from the same manufacturer, which complicates the business model of selling solutions.

Also in Australia all the four phases of a customer solution can be identified. However, there are some differences in value perceptions in each phase of the solution lifecycle than in South America.

In the presales -phase the most important factor influencing the purchase decision is the personal relationships between customers and suppliers. Customers tend to gravitate to those suppliers with whom they have good relations, knowing that the people they are working with are capable of doing the job. The respondents seemed to have a good relationship with Outotec personnel. However, some of the respondents were slightly concerned about the new generation of engineers. As one Principal Process Engineer in an engineering company concluded:

“over the last couple of years during the boom, vendors have employed a lot of very young inexperienced people and that has cost us a lot of time. We don’t want to have to teach vendors side things. We want you know the old crusty guys who know exactly what we are talking about, who are going to take a day to answer a question, so that’s been a quite significant impact over the last five years I think.”

As mentioned already, good relationship includes trust in it, which is seen as honesty and openness. Even though customers have a good relationship with Outotec, it is still seen as a very protective company. As well as in South America, customers in Australia are interested in hearing where Outotec has been successful and where it has not. Respondents complained that it is very challenging to find a mutual understanding between parties. This is mainly because suppliers and customers don’t understand each other’s objectives and the interpretation of what each phase of the project, such as pre-feasibility studies and detailed engineering, should include varies.

Another way to reduce the customer-perceived risk and to create additional value for customers is to present alternative solutions. When the customer is aware that the supplier has considered alternative technologies it will increase the trust. In the words of a project engineer from an Australian engineering company:

“Most of the times if you give us one solution we would think another solution anyway because we can’t go to the client with one solution only. We have to give them a choice. So even though the choice may not be better, it may be a lot worse it needs to be there so that we’ve demonstrated that we have thought about alternatives and actually it’s not better but we have thought about that and this is the best solution.”

Usually equipment manufacturers have the kind of knowledge that end customers or engineering companies don’t have or can’t get access to. The earlier suppliers can present alternative solutions, the better. The closer you get to the purchase process the narrower the focus of the final solution will be. If suppliers think that they have a better solution than is asked for, they should always state that.

In the customization and integration –phase customers do appreciate if they can buy complete solutions from a single supplier. However, most of them believe that there aren’t real solution suppliers in the market yet mainly because suppliers don’t have enough engineering expertise of different topics. Quality and innovativeness are also mentioned as important factors by respondents. Quality is often referred together with the manufacturing country. Outotec is preferred as a high quality manufacturer, so they don’t usually have any major issues with the quality of equipment. The importance of delivering vendor data during the customization and integration was significant probably due to the respondents being mostly engineering companies. They need the vendor data as quickly as possible so that they can start designing how the different pieces of equipment fit together and get the site ready for the delivery.

Due to Australia’s remote location from other countries delivery times and time management in general is highly valued. It is not just the delivery time of the main equipment, but also of spare parts and other components. Overseas deliveries usually mean shipping time and delays. One interviewee even mentioned that the delivery time is the determining factor if there aren’t any significant technical or

commercial differences between alternative suppliers' offerings. In Australia the need for the customer training depends on the complexity of the solution. In terms of dewatering plant solution customers will always need training in the beginning.

In the post-deployment –phase customers seemed to show the highest value towards local support and presence. Distances inside Australia are long and the deliveries to the mining sites can take a long time due to indirect connections. A supplier who has a service support team close by the customer will deliver the greatest value, since it can quickly response to customer's requests. When customer has a problem and is forced to shut down the production it will lose a lot of money. Whether they need to have a supplier's representative to arrive to the site and do a quick audit of the situation, or they need certain spare parts, it is essential that the supplier can quickly response to customer's problem. Local presence and support is considered as determining factors by many respondents when evaluating alternative suppliers. Related to the local support, consignment spares are mentioned in several interviews to add value. As one respondent from engineering company pointed out:

“might be local presence, you know, one of the companies we went had spares in Australia, the other company had spares in Singapore so we ended up going with the one with Singapore but we said only on the basis that you hold spares in Australia. So having spares close by, having support close by might be the last factor that swings you in that favor.”

In addition, maintenance is valued and often there are maintenance agreements, meaning that the supplier visits the site on a regular basis and do the maintenance checks in order to prevent customers from any major breakdowns. However, many customers still feel the lack of support after the commissioning.

Also in Australia supplier's ability to offer good service plays an important role, but the value is seen more in open and high quality relationships with the suppliers. Good service in the presales -phase is to advice, communicate and

provide customers with the information they need as quickly as possible. Many of the respondents had a long history with Outotec. They have been working with the same few Outotec people to whom they trust for many years. Some of the respondents were really concerned about the retirement of these experienced engineers and the recruitment of young inexperienced people that has cost them already a lot of time.

According to the interviewees good service always leads to a good relationship. Since most of the interviewees were from engineering companies, information exchange with suppliers in the customization and integration –phase is critical, as they need to constantly inform the customer about the advancement of the project. Services in the deployment and post-deployment –phases are similar than in the other market area. Basically the customer needs to know that they can rely on the supplier, and if something breaks down there is help available. Furthermore, customers' management of the project can be simplified if they have a single contact point through which they manage the whole project and with whom they have a good relationship. This reflects perfectly the customers' perceptions of value in Australia. They need few people that with whom they have a common understanding of working and they trust each other. In fact, Australians prefer to work with local people since there are less cultural differences involved.

4.4 Main differences in the two market areas

There are a few characteristic differences between South America and Australia. A potential factor affecting the differences in the research findings is that the interviewees in South America were mostly end customers while in Australia they were mostly engineering companies. In South America several interviewees mentioned that the technical people had a big influence on the purchase decision, whereas in Australia the purchase decision was more of a joint decision of commercial and technical team.

There was also a clear distinction in the attitudes towards solution providers between the market areas. In South America, customers were more open for the idea that suppliers deliver complete solutions, whereas in Australia the respondents had quite skeptical attitude towards that.

Relationship between supplier and customer is more emphasized in Australia than in South America. This was also noticed during the interviews. All the interviewees in Australia had a close relationship with at least some of the Outotec's employee, whereas in South America, and especially in Peru, the bond between the customer and Outotec was missing. Possibly that was one of the reasons why customers in South America highlighted the continuous support and advice from suppliers, because they haven't established a close relationship with the supplier, in which they know that they will receive support when needed.

In both market areas bundling and combinability is valued by customers. However, in Australia the respondents did not believe that there are suppliers in the market who are able to successfully deliver bundled product packages or solutions, whereas in South America the trend of buying solutions directly from suppliers is seen quite strongly. Customers in South America appreciate simplicity more than quality and innovativeness that were valued in Australia.

There are not significant distinctions in customer value perceptions in the deployment –phase. Suppliers can create value for customers with short delivery times as well as staying within the time schedule. During this period, the most important task for the supplier is to offer service and support for the customer. The needs of the customer service and support vary, but in terms of dewatering plant solution, there is always need for training and commissioning support.

In the post-deployment –phase local presence and local support were highly valued in Australia, whereas in South America the interviewees mainly pointed out the importance of continuous support. In addition, as the customers in South America wanted to have continuous support over the whole lifecycle of the

solution, customers in Australia appreciated a single contact person through which they can manage everything.

Overall, the two market areas have different characteristics due to geographical locations, cultural distinctions, and also the type of respondents. Table 6 lists the identified characteristics of both market areas from various aspects.

Table 6. Summary of the characteristics of market areas

Market area	Respondents	Decision makers	Trends	Risk reduction	Relationship	Added value	Biggest challenges
South America	Mainly end customers	Big influence from technical team	Buying directly from suppliers	Reputation References Openness	Conservative	Continuous support Simplicity Awareness of improvements	Delivery times & Time management Operational Process performance
Australia	Mainly engineering companies	Technical & Commercial team	Using eng. companies to reduce risk	Relationship References Alternative solutions Openness	Open	Close relationship Local support/presence Service Innovativeness	Time management Lack of information Operational Mutual understanding

4.5 Systematic method for understanding customer value

One of the objectives of this study is to develop a systematic method for understanding customer value, which can be deployed across all Outotec's business areas. The development of this kind of method is essential since the customer-perceived values can change significantly over the years. For example, during this study customer-perceived values may be influenced by the world's economic situation. Currently, money is in the center of discussion, but when the economic situation enhances customers might be willing to invest more in high-quality technologies and are ready to spend more money on solutions. Moreover, as many times highlighted during this study, it is substantial to understand and listen to the customer. In the words of an Australian customer:

“We don't want to hear supplier marketing propaganda as most of the time they tell us what they think we need – not necessarily what we need. The supplier is required to listen to us and offer exactly what we need. We don't have to suit to what they think we need.”

The baseline in this present method is that the supplier knows only its own products and intends to enhance its market knowledge by conducting a research on customer values. Therefore the method starts with identifying the potential customers. The systematic method is depicted in Table 7.

Table 7. Systematic method for understanding customer value.

Process steps	Managerial tasks
1. Targeting potential customers	<ul style="list-style-type: none"> • Segment market areas • Identify potential customers in chosen segments <ul style="list-style-type: none"> • Evaluate customers' own resources and capabilities (knowledge, finance) • Recognize customers who are most likely to buy your solution • Contact customers and arrange meetings <ul style="list-style-type: none"> • Contact members from DMU who provide valuable data (deciders, users etc.) • Assign a person for conducting research on customer values
2. Building research structure & conducting research	<ul style="list-style-type: none"> • Divide solution lifecycle into phases <ul style="list-style-type: none"> • Use i.e. Tuli et al. (2007) relational process –model • Develop questions for each phase that aim to identify customers' pains and gains in specific area (buying, delivery, operation, post-sale etc.) • Document customer-perceived values, challenges and risks
3. Implementing findings	<ul style="list-style-type: none"> • Assign a team from different departments who are able to make strategic decisions (Sales, Manufacturing, R&D, Service) • Focus on activities that create the most value for customers and try to fix customer-perceived challenges • Develop new products, services and/or value propositions • Share the findings across the organization internally • Share the launched actions externally • Note that findings should not be generalized across all customer segments

When the supplier has a product or a solution the first step is to conduct a segmentation of market areas and identify the most potential customers in the segments. Customers should be analyzed in terms of their capabilities and resources as it affects their willingness to purchase either complete solutions or just separate equipment. Suppliers should contact those customers who are most willing to purchase your offering. People from customer firm, who have decision power, influence on the purchase decision or are users of the equipment should be targeted, since they provide the most valuable data in terms of how to create superior value. Supplier should assign a person for this task to whom the customer

will tell an honest opinion of its values, challenges and risks. In some cases this person could be from a third party company.

The research structure starts with dividing the particular process or project lifecycle into separate phases. The most simple form of division is to separate the phases into presales and after sales –phases. On the other hand, there can be many phases that can be also quite specific (i.e. Tuli et al. (2007) relational process – framework). The more phases the process is divided into, the more accurate results will be found. The purpose is to find out what kind of features create value for customers (gains) and what are the biggest challenges (pains) for them in each phase of the solution. Findings need to be analyzed by documenting the most significant pains and gains.

According to the findings a company should form a team of different departments (i.e. sales, manufacturing, R&D, and service) that are pertained to the results. The team should focus on strengthening or developing those features that create added value for customers and fixing or erasing features that are customers' biggest challenges and risks. On the basis of these features new products, services and/or value propositions can be developed. However, it is not enough that the dedicated team is only aware of the research results. The findings should be shared internally across the organization in order to inform all employees about customer values so that the whole company works in a similar manner and towards a single goal. The supplier should also conduct external reporting, for example of new services that they have developed, since customers are always interested to hear about new things that create value.

Companies should systematically conduct research on customer values since new trends are arising and the business is changing rapidly. In addition, changes in the world's economic situation might affect how customers behave and make decisions on solutions. However, the findings should not be generalized across all market areas. Findings should be analyzed separately from each market area and find out if there are any significant differences.

5 CONCLUSIONS

The focus of this study was to find out how customers purchase and perceive value from integrated solutions in mining industry during the solution lifecycle. Since customer-perceived values were examined in Australia and South America, the purpose was also to explore if there were any significant differences between the two market areas. First, existing theories about solutions and customer value in business-to-business markets were reviewed. Second, the case company and the dewatering plant solution were introduced and research methodology presented.

The research was conducted using an embedded multiple-case study method and the data was gathered by conducting interviews in South America and Australia with Outotec's existing and potential customers. Both market areas are important for Outotec in terms of the dewatering plant solution. In addition to the primary data, some secondary data was also used to strengthen the results.

In this chapter conclusions from the research findings are made and research questions are answered. This chapter consists of two parts. First, research questions are answered and managerial implications are suggested for Outotec in order to improve their value proposition of dewatering plant solution. Second, suggestions for future research are conducted to address the delimitations of this research.

5.1 Answers to the research questions

In this section the three research questions are answered in order to meet the objectives of this study. Based on the answers of the research questions more effective value proposition can be created.

1. *Research question: How industrial companies in mining sector purchase solutions?*

The aim of the first research question was to study how customers' purchase solutions in the mining industry. The finding was that there are two kinds of purchase processes that are presented in Figure 10. Still more traditional way in the market is to have an engineering company between the end customer and the supplier. The second option that is gaining attention in the market is that the end customer purchases the solution directly from a solution provider such as Outotec.

Outotec's primary goal in terms of the dewatering plant solution is to sell directly to end customers in order to get access to bigger profits. However, engineering companies are also important customers for Outotec, but selling a complete solution for them is difficult. Engineering companies' core competence is to design a solution from different pieces of equipment, so therefore they usually purchase only discrete pieces of equipment.

From *customer's point of view* it is important to know why customers use engineering companies in between, so that more solutions could be sold directly to end customers in the future. From *supplier's point of view*, it is essential to understand the different value arguments when selling to engineering companies, whereas selling directly to customers.

The main reason why customers use engineering companies is that they want to reduce the perceived risk. Whether they don't have own engineering resources or they don't trust that the supplier has the required expertise to deliver a complete solution. Customers' biggest concern is the supplier's ability to do the civil engineering for the equipment, whereas engineering companies have experts in this area as well. Moreover, by using engineering companies customers can construct the solution from different pieces of equipment and the engineering company is responsible for managing the project in terms of quality, design and standards. In the case of tight schedule or budget solution providers are usually considered as they can provide solutions faster and with less expenses. Figure 14 lists the factors that drive customers towards engineering companies or solutions providers.

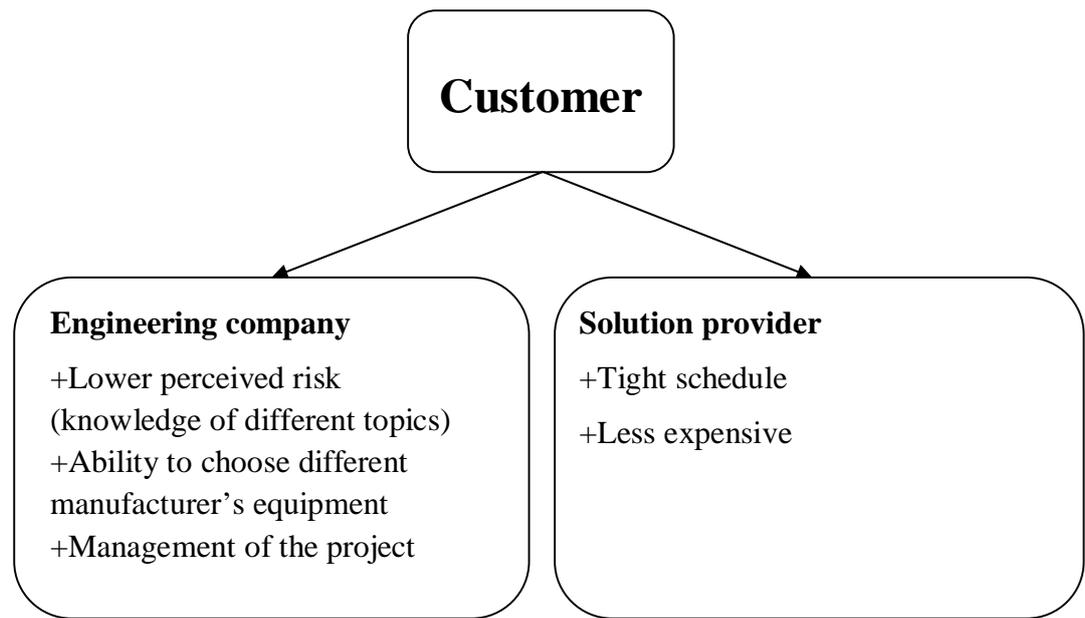


Figure 14. Purchasing solutions from customer's point of view.

Suppliers have to customize their value proposition differently for engineering companies and end customers. Engineering companies prefer to buy complete solutions of which they don't have own knowledge. However, the area of dewatering is quite well known among engineering companies. Therefore, it's more likely that engineering companies will purchase only equipment and do the engineering by themselves. Engineering companies are not usually responsible for what happens after the solution has been installed. Therefore, they are more interested in the technical reliability of the products, and that the solution fits into the customer's budget. End customers are more potential buyers for complete solutions, since they are more reliant on the support. As mentioned earlier, they are not yet fully convinced of supplier's ability to deliver complete solutions. They need to be assured that the supplier can deliver the solution properly and provide support throughout the solution lifecycle. Thus, it can be concluded that suppliers need to have different value propositions and arguments for engineering companies and end customers due to different needs. Figure 15 summarizes the supplier's different value arguments for engineering companies and end customers.

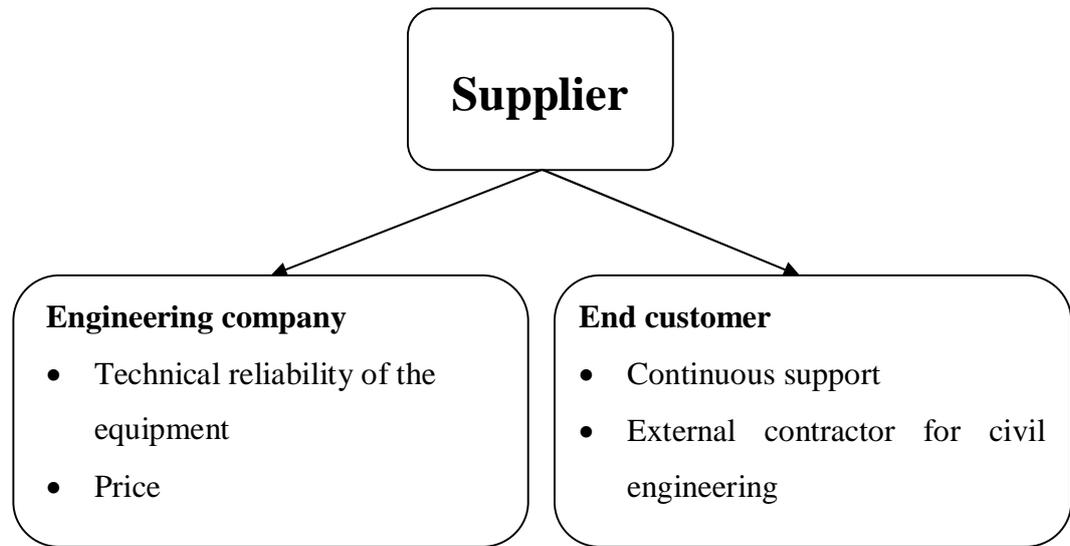


Figure 15. Supplier's value arguments for different type of customers.

2. *Research question: How customers perceive value during the lifecycle of the solution?*

The goal of this research question was to identify the value adding features in each phase of the solution lifecycle (*Presales, Customization & Integration, Deployment, Post-deployment*). Several value adding benefits were recognized in each phase that creates superior value and lowers the customer-perceived risk of Outotec's existing and potential customers.

In the presales –phase supplier's primary task is to convince the customer to buy the supplier's offering. The main target is to reduce the customer-perceived risk, which can be done by demonstrating a good track record in the past, having an open relationship with the customer and assuring that the customer will get support in the future. One of the most effective ways to reduce the customer-perceived risk is to present references that are similar to customers' processes, and to calculate and demonstrate the costs that will emerge during the lifecycle of the solution.

In the customization and Integration –phase value is delivered with bundled product packages and combinability across the solution. Outotec’s ability to combine thickening and filtration into dewatering plant solution, and the knowledge of what happens upstream and downstream of the process is very valuable. This will increase the confidence that the solution will work as it should. Customers value also if the solution is built from the same manufacturer’s components, so that for example the least amount of spare parts are needed.

In the deployment –phase customers appreciate fast delivery times and supplier’s ability to deliver on time. The biggest challenges among all customers were related to the timing. Projects are almost always significantly late. For complex solutions like a dewatering plant solution customers always need training and support in the commissioning.

In the post-deployment –phase customers want to be sure that they receive technical support whenever is needed. Most value is derived from supplier’s ability to provide support as quick as possible, since the mining sites can be located in remote places. Many customers valued consignment spares in order to have a quick access to critical spares. Figure 16 summarizes the customer-perceived values in each phase.

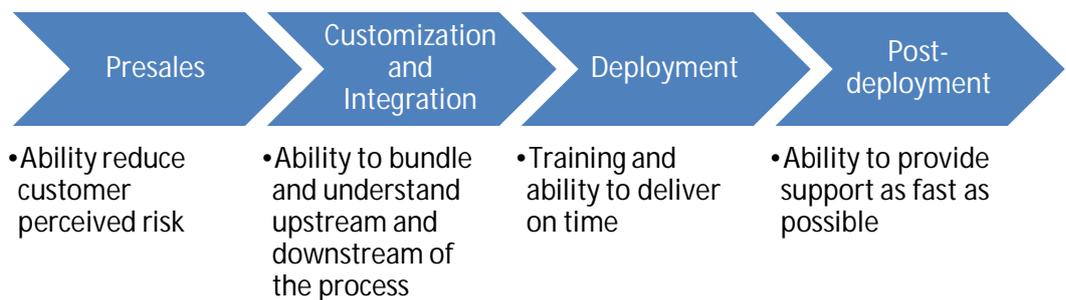


Figure 16. Main themes of customer value perceptions in each phase.

3. *Research question: How customers’ value perceptions differ between South America and Australia?*

The objective of this research question was to identify the differences in characteristics between South America and Australia in order to understand how cultural differences affect the customer-perceived benefits. On the basis of this research question Outotec can better allocate its resources to specific market areas.

The main difference between market areas was that in South America *continuous technical support from suppliers* was needed throughout the lifecycle, whereas in Australia customers mainly highlighted the *dyadic relationship between customer and supplier*. This stems probably from the cultural differences between the market areas. Having been a participating observer in both market areas, there could be seen a clear distinction in the working methods. In South America the working culture is not as organized as in Australia and the bond between customer and supplier is weaker. This explains the compelling need for continuous technical support. Customers want to be completely sure that the supplier will not disappear after the delivery and will be available whenever needed. In Australia, this kind of need was not so recognizable, since the normal way of working involves regular contacting with customers and having a trusty relationship with them.

In Australia, customers emphasized the importance of trust in the relationship. They prefer to have a single contact person in a supplier firm to whom they can really trust and through which they can manage everything. Preferably the contact person should be local, since they understand each other's way of working better. They were not concerned of the supplier disappearing after commissioning of the products, since they rely on the supplier to be present when they need support.

In South America, the respondents were underlining the importance of being more open as a supplier, which indicates the lack of trust in the relationships. Simplicity was also more valued in South America than Australia, probably because of the lower educational level of the personnel. Australians are more open for

innovations and appreciate high quality. After the commissioning, customers in South America were interested in hearing about upgrades and improvements that can enhance their process performance. In Australia, the respondents highlighted local support and presence in terms of fast service, since the inland distances are so long.

There can be seen a clear future trend in South America that end customers are starting to buy solutions directly from suppliers. In Australia the trend is not seen as strong, since they think that suppliers need yet to mature in order to become solution providers. Thus, it can be argued that there is more potential in South America for solution selling than in Australia.

5.2 Managerial implications

This section gives suggestions for Outotec to develop its value proposition on the basis of the research findings. The present study gives insights to managers of how customers view solutions and how suppliers could create superior value for them. Customer-perceived values in customization & integration, deployment, and post-deployment -phases have an impact on what customer wants to know in the presales –phase. Thus, it should be noted that the value proposition consists of the value adding features that customers perceive in each phase of the solution lifecycle.

First, since there are two types of customers, engineering companies and end customers, Outotec has to see the difference of how their customers perceive a solution. When selling solutions to end customers, Outotec needs to emphasize two things in their value proposition: 1) *Ability to deliver a complete solution*, and 2) *Continuous support throughout the solution life cycle*. Ability to deliver a complete solution means that Outotec needs to start increasingly marketing itself as a solution provider, meaning that they need to convince end customers that they have all the required engineering expertise for delivering a complete solution. As the construction part of the solution is seen as a major issue, Outotec has to

highlight in their value proposition that the construction is done by external contractor who is specialized in industrial civil engineering. End customers also want to be assured that the supplier will support them throughout the solution lifecycle. Therefore, Outotec should focus on developing services through which they can support customers better and with less expense.

Engineering companies normally buy only discrete pieces of equipment. Hence, it is and will be difficult to sell complete solutions to them, since it is their core business to create and engineer solutions from different pieces of equipment for customers. The value proposition directed to engineering companies should include features that stress the product's technical reliability and demonstrates the low life cycle costs.

Common for all customers when making purchase decisions is that they seek for solutions that create the most value with the minimum risk. Reducing customer-perceived risk during the *presales –phase* should be the core purpose of all suppliers. There are several ways to do this but according to the findings references are the most effective and valued by customers. Managers in Dewatering business line should allocate adequate amount of resources for developing reference cases that demonstrates how Outotec solutions improve the performance and lower the costs of the mine.

In the customization and integration –phase suppliers' ability to manufacture bundled product packages and design commonality across the equipment components is highly valued. Therefore, Outotec should continue investing in R&D in order to develop solutions that are easier to use and maintain, less expensive and quicker to assemble and deliver.

One of the biggest customer-perceived challenges is related to the *deployment –phase*, which is the timing. Shorter delivery times were understandably valued since customer is able to start production earlier. Outotec should highlight in its value proposition the ability to deliver the dewatering plant solution significantly

faster than competitors due to already productized design of the solution. With as complex offering as dewatering plant solution trainings for the operators should be always offered.

To create value after the delivery and installation and strengthen the brand image Outotec should offer high quality service in terms of fast responses to customers' emerging problems and needs. To enable this Outotec should reconsider their service strategy and think about whether to establish spare part stocks or local service centers into strategically central locations. Whether these are too expensive to implement, Outotec should increasingly focus on developing remote support –services.

Studies on customer-perceived value should be continuous over time. Following the systematic method for understanding customer values that was presented in section 4.5 companies can easily gain a good overview of how to create superior value to customers.

5.3 Limitations and further research

Research on customer value from integrated solutions has been widely examined. In this study mainly technical people were interviewed. The respondents had an influence on the purchase decision by recommending technically the best suitable solution for the final decision maker. To get a wider understanding of the purchase process also other members of DMU (buyers, users, and deciders) should be interviewed.

In Australia an Outotec employee was responsible for choosing the respondents for the interviews. Majority of the respondents were closely cooperating with Outotec and had a very good relationship with Outotec's employees. This might have affected respondents' answers in a positive manner. Moreover, in South America an Outotec employee was present in some of the interviews as a translator, which might have impacted on the customers' answers. Also the

translator might have not translated everything what the customer had answered. Since the time for the interviews especially in South America was limited, there was not always time for asking the same set of questions. In some of the interviews only about half of the questions were asked. Therefore, the findings are not absolutely comparable.

There are not identical customers and projects in the mining industry. Customers are heterogeneous and have different capabilities and values. Therefore, the results from this study cannot be blindly applied for every customer in the mining industry. Even though the RIVIS –research project focused on industrial solutions in general, the results from this study can be applied for dewatering solution as well, since all the interviewed customers were Outotec’s existing or potential customers.

This study provides a holistic view of features that create incremental value for customers in mining industry. More detailed research should be conducted of each feature in order to better understand how the value is delivered, for example, what kind of information references should include especially in mining industry to lower the customer-perceived risk. Also research on solution pricing, value-based pricing in mining industry should be conducted. In other words, how companies should price their solutions and services.

Research on *customer-perceived value of solutions in different cultures* is relatively scarce. The findings of this study showed that customer-perceived values are not completely similar between cultures and continents. Therefore, further research on this topic should be conducted in order to be able to adapt to local requirements more efficiently.

6 SUMMARY

In this Master's Thesis customer values of integrated solutions in mining industry were examined. There is plethora of terms of solutions, but primarily they are defined as bundle of products, services, and software that can solve specific customer problems. Many companies have seen the potential of solutions in terms of higher margins and increased value. Therefore, many industrial firms have tried to move from pure product manufacturer to solution provider with varying success. The prerequisite for this is to understand the customer's view of solutions. They have more of a relational process –view than product-centric –view, which is how suppliers traditionally see solutions.

Suppliers need to understand how customers buy complex industrial solutions, and thus they need to know the customers' purchase process. Currently, in mining industry customers generally involve engineering companies in the purchase process to integrate different pieces of equipment into a complete solution. However, according to the gathered data there can be seen a growing trend among customers that they are starting to buy solutions directly from suppliers, who are capable of designing, delivering and constructing complete solutions. In this study the purchase process and customer-perceived values are examined in terms of Outotec's dewatering plant solution. Outotec's goal is to sell the dewatering plant solution directly to customers. However, some customers are not yet convinced about their ability to deliver complete solutions. They think that Outotec is still more of an equipment supplier. Customers want to reduce the risk by passing the work to engineering companies who have knowledge of different topics.

Also customers' perceptions of value during solution lifecycle were studied using the Tuli et al. (2007) relational process –model. The findings showed that during the evaluation of alternative solutions customers will choose solution that satisfies their core benefits and has the lowest risk. Customers also value if they can purchase several equipment from single supplier. Supplier's ability to deliver the solution faster than competitors or at least on schedule is very valuable since the

biggest challenges are related to delays. After sales service is essential in today's world and it is not just providing spare parts. It is more of being continuously available and reachable in case the customer has any problems.

In this research two market areas, South America and Australia, were under examination. There can be seen clear divergences in the working culture between market areas, which can be reflected in the needs of the customers. In South America, the customer relationship management was not so strong than in Australia, which might be the biggest reason for the customers' compelling need for continuous support. In Australia, the importance of customer-supplier relationship was highlighted and they prefer to do business with whom they have already good relationship.

However, world is continuously changing and so are the customer-perceived values. For example, during this study the world's economic situation and the mining industry is suffering and customers are not willing to make investments or they are really sharp on the money. This might have influenced on the findings of this study. Therefore, companies should conduct this kind of research constantly and adapt their value propositions and strategies according to current customer needs.

REFERENCES

Aarikka-Stenroos, L. and Jaakkola, E. (2012). Value co-creation in knowledge intensive business services: A dyadic perspective on the joint problem solving process. *Industrial Marketing Management*, 41(1), pp.15-26.

Anderson, J. C. and Wynstra, F. (2010). Purchasing Higher-Value, Higher-Price Offerings in Business Markets. *Journal of Business-to-Business Marketing*, 17(1), pp.29-61.

Anderson, J. C. and Narus, J. A. (2004). *Business marketing management: Understanding, creating, and delivering value*. Upper Saddle River, NJ. Pearson Prentice Hall.

Anderson, J. C., Narus, J. A., & Van Rossum, W. (2006). Customer value propositions in business markets. *Harvard business review*, 84(3), 90.

B2B International, (2015). *Market Segmentation in B2B Markets | B2B Segmentation*. [online]. [Accessed 8 Apr. 2015]. Available at: <https://www.b2binternational.com/publications/b2b-segmentation-research/>

Ballantyne, D., & Varey, R. J. (2006). Introducing a dialogical orientation to the service-dominant logic of marketing. In Robert F. Lusch, & Stephen L. Vargo (Eds.), *The service-dominant logic of marketing. Dialog, debate, and directions*. (pp. 224–235) New York: M.E. Sharpe.

Biggemann, S., Kowalkowski, C., Maley, J. and Brege, S. (2013). Development and implementation of customer solutions: A study of process dynamics and market shaping. *Industrial Marketing Management*, 42(7), pp.1083-1092.

Blocker, C. (2011). Modeling customer value perceptions in cross-cultural business markets. *Journal of Business Research*, 64(5), pp.533-540.

Bower, J. (2005). Breakthrough ideas for 2005: The Velcro Organization. *Harvard business review*, 83 (2), 6-7.

Brady, T., Davies, A. and Gann, D. (2005). Creating value by delivering integrated solutions. *International Journal of Project Management*, 23(5), pp.360-365.

Brax, S. and Jonsson, K. (2009). Developing integrated solution offerings for remote diagnostics: A comparative case study of two manufacturers. *International Journal of Operations & Production Management*, 29(5), pp.539-560.

Connolly, E., & Orsmond, D. (2011). *The mining industry: from bust to boom*. Economic Analysis Department, Reserve Bank of Australia.

Cornet, E., Schädler, J., Katz, R., Sharma, D., Molloy, R., Tipping, A. (2000). *Customer Solutions: From Pilots to Profits*. Booz, Allen & Hamilton, New York, NY.

Coviello, N., Brodie, R., Danaher, P. and Johnston, W. (2002). How Firms Relate to Their Markets: An Empirical Examination of Contemporary Marketing Practices. *Journal of Marketing*, 66(3), pp.33-46.

Davies, A. (2003). "Are firms moving 'downstream' into high-value services?". In Tidd, J. and Hull, F.M. (Eds), *Service Innovation: Organizational Responses to Technological Opportunities & Market Imperatives*, (321 – 340). Imperial College Press, London.

Davies, A. and Brady, T. (2000). Organisational capabilities and learning in complex product systems: towards repeatable solutions. *Research Policy*, 29(7-8), pp.931-953.

Day, G. S. (2000). Managing market relationships. *Journal of the Academy of Marketing Science*, 28(1), pp.24–30.

Day, G. S. (2004). Achieving Advantage with a New Dominant Logic,” in “Invited Commentaries on ‘Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*.

Dhar, R., Menon, A. and Maach, B. (2004). Toward Extending the Compromise Effect to Complex Buying Contexts. *Journal of Marketing Research*, 41(3), pp.258-261.

Evanschitzky, H., Wangenheim, F. and Woisetschläger, D. (2011). Service & solution innovation: Overview and research agenda. *Industrial Marketing Management*, 40(5), pp.657-660.

Foote, N. W., Galbraith, J., Hope, Q., & Miller, D. (2001). Making solutions the answer. *The McKinsey Quarterly*, 84.

Goedkoop, M. (1999). *Product service systems, ecological and economic basics*. [The Hague]: [Ministry of Housing, Spatial Planning and the Environment, Communications Directorate].

Grönroos, C. (2011). A service perspective on business relationships: The value creation, interaction and marketing interface. *Industrial Marketing Management*, 40(2), pp.240-247.

Hakanen, T. and Jaakkola, E. (2012). Co-creating customer-focused solutions within business networks: a service perspective. *Journal of Service Management*, 23(4), pp.593-611.

Homburg, C., Kuester, S., Beutin, N. and Menon, A. (2005). Determinants of Customer Benefits in Business-to-Business Markets: A Cross-Cultural Comparison. *Journal of International Marketing*, 13(3), pp.1-31.

Homburg, C. and Rudolph, B. (2001). Customer satisfaction in industrial markets: dimensional and multiple role issues. *Journal of Business Research*, 52(1), pp.15-33.

Jaakkola, E. and Hakanen, T. (2013). Value co-creation in solution networks. *Industrial Marketing Management*, 42(1), pp.47-58.

Jacob, F. and Ulaga, W. (2008). The transition from product to service in business markets: An agenda for academic inquiry. *Industrial Marketing Management*, 37(3), pp.247-253.

Johnston, W. and Bonoma, T. (1981). The Buying Center: Structure and Interaction Patterns. *Journal of Marketing*, 45(3), p.143.

Karmarkar, U. (2004). Will you survive the service revolution?. *Harvard business review*. June, pp. 101-7.

Kivetz, R., Netzer, O. and Srinivasan, V. (2004). Alternative Models for Capturing the Compromise Effect. *Journal of Marketing Research*, 41(3), pp.237-257.

Kotler, P. (1994), *Marketing Management: Analysis, Planning, Implementation and Control*, 8th ed., Prentice-hall, Englewood Cliffs, NJ.

Krishnamurthy, C., Johansson, J., and Schliessberg, H. (2003), *Solutions Selling: Is the Pain worth the Gain?*, McKinsey Marketing Solutions.

Lindgreen, A. and Wynstra, F. (2005). Value in business markets: What do we know? Where are we going?. *Industrial Marketing Management*, 34(7), pp.732-748.

Lindgreen, A., Hingley, M., Grant, D. and Morgan, R. (2012). Value in business and industrial marketing: Past, present, and future. *Industrial Marketing Management*, 41(1), pp.207-214.

Miller, D., Hope, Q., Eisenstat, R., Foote, N. and Galbraith, J.R. (2002), “ The problem of solutions: balancing clients and capabilities”, *Business Horizons*, Vol. 45 No. 2, pp. 3-12

Möller, K., & Törrönen, P. (2003). Business suppliers' value creation potential: A capability-based analysis. *Industrial Marketing Management*, 32(2), pp.109–118.

OECD, 2014. PISA 2012 Results In Focus: What 15-year-olds know and what they can do with what they know. Available at: <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf>

Oliva, R. and Kallenberg, R. (2003). Managing the transition from products to services. *International Journal of Service Industry Management*, 14(2), pp.160-172.

Outotec, (2014a). Financial statements 2014. [Accessed 26.03.2015] Available from Outotec Oy web site.

Outotec, (2014b). Outotec Dewatering webinar. [Accessed 13.03.2015] Available at: http://wms.magneetto.com/ot/2014_0617_dewatering_webinar/view

Outotec, (2015a). *Our business / Outotec*. [online]. [Accessed 23 Mar. 2015]. Available at: <http://www.outotec.com/en/About-us/Our-business/>

Outotec, (2015b). *Operating model / Outotec*. [online]. [Accessed 23 Mar. 2015]. Available at: <http://www.outotec.com/en/About-us/Operating-model/>

Outotec, (2015c). *Our technologies / Outotec*. [online]. [Accessed 23 Mar. 2015]. Available at: <http://www.outotec.com/en/About-us/Our-technologies/Iron-ore-beneficiation/>

Outotec, (2015d). *Dewatering solutions / Outotec*. [online]. [Accessed 23 Mar. 2015]. Available at: <https://live.outotec.com/public/dewateringsolutions/>

Outotec, (2015e). *Sustainability / Outotec*. [online]. [Accessed 23 Mar. 2015]. Available at: <http://www.outotec.com/en/Sustainability/About-Outotec/This-is-Outotec/>

Reichheld, F. F., & Teal, T. (2001). *The loyalty effect: The hidden force behind growth, profits, and lasting value*. Harvard Business Press.

Sawhney, M. (2006). Going beyond the product, defining, designing, and delivering customer solutions. In R. F. Lusch, & S. L. Vargo (Eds.), *The service-dominant logic of marketing: Dialog, debate, and directions* (pp. 365–380). New York: M.E. Sharpe.

Sawhney, M., Balasubramanian, S., & Krishnan, V. V. (2003). Creating growth with services. *MIT Sloan Management Review*, 45(2), 34-44.

Stremersch, S., Weiss, A., Dellaert, B. and Frambach, R. (2003). Buying Modular Systems in Technology-Intensive Markets. *Journal of Marketing Research*, 40(3), pp.335-350.

Stremersch, S., Wuyts, S. and Frambach, R. (2001). The Purchasing of Full-Service Contracts. *Industrial Marketing Management*, 30(1), pp.1-12.

Tuli, K., A. Kohli, and S. G. Bharadwaj (2007), "Rethinking customer solutions: From product bundles to relational processes," *Journal of Marketing*, 71(3), pp.1–17.

Töllner, A., Blut, M. and Holzmüller, H. (2011). Customer solutions in the capital goods industry: Examining the impact of the buying center. *Industrial Marketing Management*, 40(5), pp.712-722.

Ueltschy, L., Laroche, M., Tamilia, R. and Yannopoulos, P. (2004). Cross-cultural invariance of measures of satisfaction and service quality. *Journal of Business Research*, 57(8), pp.901-912.

Uлага, W., & Chacour, S. (2001). Measuring customer-perceived value in business markets: A prerequisite for marketing strategy development and implementation. *Industrial Marketing Management*, 30(6), pp.525–540.

Uлага, W. and Reinartz, W. (2011). Hybrid Offerings: How Manufacturing Firms Combine Goods and Services Successfully. *Journal of Marketing*, 75(6), pp.5-23.

Vargo, S. and Lusch, R. (2004). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68(1), pp.1-17.

Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26(3), pp.145–152.

Webster, F. and Wind, Y. (1972). A General Model for Understanding Organizational Buying Behavior. *Journal of Marketing*, 36(2), p.12.

Wilson, E. and Woodside, A. (1994). The Relative Importance of Choice Criteria in Organizational Buying:. *Journal of Business-to-Business Marketing*, 2(1), pp.33-58.

Wise, R., & Baumgartner, P. (1999). Go downstream: the new profit imperative in manufacturing. *Harvard business review*, 77(5), 133-141.

Woodruff, R. (1997). Customer value: The next source for competitive advantage. *Journal of the Academy of Marketing Science*, 25(2), pp.139-153.

Yin, R. (2009). *Case study research*. 4th edition. Thousand Oaks, Calif.: Sage Publications.

APPENDICES

Appendix 1. OECD PISA report in 2012

Appendix 2. Interview structure

Appendix 1. OECD PISA report in 2012

Snapshot of performance in mathematics, reading and science

- Countries/economies with a mean performance/share of top performers above the OECD average
Countries/economies with a share of low achievers below the OECD average
- Countries/economies with a mean performance/share of low achievers/share of top performers not statistically significantly different from the OECD average
- Countries/economies with a mean performance/share of top performers below the OECD average
Countries/economies with a share of low achievers above the OECD average

	Mathematics				Reading		Science	
	Mean score in PISA 2012	Share of low achievers in mathematics (Below Level 2)	Share of top performers in mathematics (Level 5 or 6)	Annualised change in score points	Mean score in PISA 2012	Annualised change in score points	Mean score in PISA 2012	Annualised change in score points
OECD average	494	23.0	12.6	-0.3	496	0.3	501	0.5
Shanghai-China	613	3.8	55.4	4.2	570	4.6	580	1.8
Singapore	573	8.3	40.0	3.8	542	5.4	551	3.3
Hong Kong-China	561	8.5	33.7	1.3	545	2.3	555	2.1
Chinese Taipei	560	12.8	37.2	1.7	523	4.5	523	-1.5
Korea	554	9.1	30.9	1.1	536	0.9	538	2.6
Macao-China	538	10.8	24.3	1.0	509	0.8	521	1.6
Japan	536	11.1	23.7	0.4	538	1.5	547	2.6
Liechtenstein	535	14.1	24.8	0.3	516	1.3	525	0.4
Switzerland	531	12.4	21.4	0.6	509	1.0	515	0.6
Netherlands	523	14.8	19.3	-1.6	511	-0.1	522	-0.5
Estonia	521	10.5	14.6	0.9	516	2.4	541	1.5
Finland	519	12.3	15.3	-2.8	524	-1.7	545	-3.0
Canada	518	13.8	16.4	-1.4	523	-0.9	525	-1.5
Poland	518	14.4	16.7	2.6	518	2.8	526	4.6
Belgium	515	19.0	19.5	-1.6	509	0.1	505	-0.9
Germany	514	17.7	17.5	1.4	508	1.8	524	1.4
Viet Nam	511	14.2	13.3	m	508	m	528	m
Austria	506	18.7	14.1	0.0	490	-0.2	506	-0.8
Australia	504	19.7	14.8	-2.2	512	-1.4	521	-0.9
Ireland	501	16.9	10.7	-0.6	523	-0.9	522	2.3
Slovenia	501	20.1	13.7	-0.6	481	-2.2	514	-0.8
Denmark	500	16.8	10.0	-1.8	496	0.1	498	0.4
New Zealand	500	22.6	15.0	-2.5	512	-1.1	516	-2.5
Czech Republic	499	21.0	12.9	-2.5	493	-0.5	508	-1.0
France	495	22.4	12.9	-1.5	505	0.0	499	0.6
United Kingdom	494	21.8	11.8	-0.3	499	0.7	514	-0.1
Iceland	493	21.5	11.2	-2.2	483	-1.3	478	-2.0
Latvia	491	19.9	8.0	0.5	489	1.9	502	2.0
Luxembourg	490	24.3	11.2	-0.3	488	0.7	491	0.9
Norway	489	22.3	9.4	-0.3	504	0.1	495	1.3
Portugal	487	24.9	10.6	2.8	488	1.6	489	2.5
Italy	485	24.7	9.9	2.7	490	0.5	494	3.0
Spain	484	23.6	8.0	0.1	488	-0.3	496	1.3
Russian Federation	482	24.0	7.8	1.1	475	1.1	486	1.0
Slovak Republic	482	27.5	11.0	-1.4	463	-0.1	471	-2.7
United States	481	25.8	8.8	0.3	498	-0.3	497	1.4
Lithuania	479	26.0	8.1	-1.4	477	1.1	496	1.3
Sweden	478	27.1	8.0	-3.3	483	-2.8	485	-3.1
Hungary	477	28.1	9.3	-1.3	488	1.0	494	-1.6
Croatia	471	29.9	7.0	0.6	485	1.2	491	-0.3
Israel	466	33.5	9.4	4.2	486	3.7	470	2.8
Greece	453	35.7	3.9	1.1	477	0.5	467	-1.1
Serbia	449	38.9	4.6	2.2	446	7.6	445	1.5
Turkey	448	42.0	5.9	3.2	475	4.1	463	6.4
Romania	445	40.8	3.2	4.9	438	1.1	439	3.4
Cyprus ¹	440	42.0	3.7	m	449	m	438	m
Bulgaria	439	43.8	4.1	4.2	436	0.4	446	2.0
United Arab Emirates	434	46.3	3.5	m	442	m	448	m
Kazakhstan	432	45.2	0.9	9.0	393	0.8	425	8.1
Thailand	427	49.7	2.6	1.0	441	1.1	444	3.9
Chile	423	51.5	1.6	1.9	441	3.1	445	1.1
Malaysia	421	51.8	1.3	8.1	398	-7.8	420	-1.4
Mexico	413	54.7	0.6	3.1	424	1.1	415	0.9
Montenegro	410	56.6	1.0	1.7	422	5.0	410	-0.3
Uruguay	409	55.8	1.4	-1.4	411	-1.8	416	-2.1
Costa Rica	407	59.9	0.6	-1.2	441	-1.0	429	-0.6
Albania	394	60.7	0.8	5.6	394	4.1	397	2.2
Brazil	391	67.1	0.8	4.1	410	1.2	405	2.3
Argentina	388	66.5	0.3	1.2	396	-1.6	406	2.4
Tunisia	388	67.7	0.8	3.1	404	3.8	398	2.2
Jordan	386	68.6	0.6	0.2	399	-0.3	409	-2.1
Colombia	376	73.8	0.3	1.1	403	3.0	399	1.8
Qatar	376	69.6	2.0	9.2	388	12.0	384	5.4
Indonesia	375	75.7	0.3	0.7	396	2.3	382	-1.9
Peru	368	74.6	0.6	1.0	384	5.2	373	1.3

Appendix 2. Interview structure

Background

1. Background information (Name, job description (title), and years of experience in current or similar position)

Purchasing solutions (products + services) in general

2. What kinds of supplier's offerings represent solutions according to you?
3. What features do you evaluate when you consider purchasing a solution? Are some features more important than others?
4. What is your company's policy about sustainability?
5. How do you evaluate alternative solution suppliers?
6. Do you usually purchase solutions directly from suppliers or from engineering companies? What kind of value engineering companies bring to you compared to buying directly from manufacturers?
7. What kind of things you would like to hear from suppliers when they are marketing their solution to you?
8. What kind of actions you would appreciate from the supplier during the early stage?
9. What kind of challenges you face during the early stage of the project?
10. Who are the decision makers? Who makes the final purchase decision?
11. Are solution suppliers usually ready to customize their products and services to fit into the customer's process? What does this require from the customer? (Time, energy, resources?)
12. How well suppliers usually succeed in implementing the solution? What kind of problems/challenges suppliers have during implementation?
13. What kind of services from the supplier's side you would like to have in the implementation phase?
14. How would you like suppliers to ensure that customers realize the promised benefits? Can you give an example? How does this benefit the customer?
15. How suppliers help customers to get the maximum benefits out of the solution?
16. What kind of services from the supplier's side you would appreciate after the commissioning?
17. What kind of pricing models are the most suitable for solutions from customer's perspective?
18. What are the biggest challenges in purchasing solutions?

Outotec-related questions

19. How do you see Outotec as a solution provider?
20. How did you end up choosing specifically Outotec's offering?
21. Who were the most significant competitors regarding the offering?
22. Which sales arguments were the most important when you were doing the purchase decision?
23. What kind of benefits Outotec's offering produces for your organization?
What about for individual employee?
24. In what kinds of things Outotec's offering is better than the competitors' offerings? Worse?
25. In what kinds of things Outotec as a supplier is better than the competitors? Worse?
26. How did Outotec help you in the deployment of the solution?
27. How does Outotec support you after the deployment (post-deployment phase)?
28. How does Outotec ensure that you realize the promised benefits of the solution?
29. How does Outotec measure or assess the customer benefits that you experience?
30. Have you been satisfied with the Outotec's offering?