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**APPLICATION OF PORTFOLIO MODEL AS A SUPPLIER CLASSIFICATION TOOL –
POWER AND DEPENDENCE PERSPECTIVE**

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Toimittajien luokittelun merkitys yrityksissä on kasvanut, sillä jatkuvasti muuttuvassa liiketoimintaympäristössä toimittajia tulee hallita yhä tehokkaammin, mutta samalla huomioiden hankintojen erityispiirteet sekä ostajan ja toimittajan välinen suhde. Lisäksi yritykset ovat aina joissain määrin riippuvaisia muiden organisaatioiden resursseista, mikä luo eroavaisuuksia yritysten välisiin valta- ja riippuvuussuhteisiin. Nämä valta- ja riippuvuussuhteet vaikuttavat siihen, miten eri toimittajia kannattaa tai on mahdollista hallita. Tämän pro gradu -tutkielman tarkoitus oli kuvailla, kuinka toimittajia voidaan portfoliomallia hyödyntäen luokitella ja näin hallita optimaalisesti, huomioiden samalla sekä hankintojen erityispiirteet että olemassa olevat valta- ja riippuvuussuhteet toimittajiin.

Tutkielma toteutettiin tapaustutkimuksena, jossa keskityttiin yhteen valittuun puolustus-, turvallisuus- ja ilmailualalla toimivan kohdeyrityksen liiketoimintayksikköön. Tutkimuksen luonne oli laadullinen ja data kerättiin pääasiallisesti viidellä puolistrukturoidulla haastattelulla, joissa haastateltiin valitun liiketoimintayksikön hankintaorganisaatiota. Lisäksi dataa kerättiin havainnoimalla ja kohdeyrityksen nettisivuilta, intranetistä, toiminnanohjausjärjestelmästä sekä olemassa olevista dokumenteista, kuten erilaisista ohjeistuksista.

Ehdotetun portfoliomallin soveltaminen kuvailtiin kolmen vaiheen kautta. Ensin analysoitiin kohdeyrityksen hankintoja niiden tulosvaikutuksen, eli hankintojen rahallisen arvon ja hankintariskin, eli hankintojen saatavuuden haasteellisuuden perusteella. Tulosvaikutuksen ja hankintariskin arvioimiseksi määriteltiin kohdeyrityksen kannalta relevantit tekijät. Näiden tekijöiden avulla toimittajat voidaan sijoittaa portfolioon ja siten luokitella. Seuraavaksi tunnistettiin erilaisia vallan ja riippuvuuden lähteitä, joiden avulla voidaan määrittää yritysten välinen valtasuhde ja näin arvioida toimittajasuhteen luonnetta. Lopulta näiden analyysien perusteella ehdotettiin toimintasuunnitelmia erilaisten toimittajaluokkien hallintaan. Tutkimus siis tarjosi kohdeyritykselle mallin toimittajien luokitteluun ja suuntaviivat toimittajien hallintaan huomioiden valta- ja riippuvuussuhteet. Näin ollen tutkimus lisäsi ymmärrystä portfoliomallin soveltamisesta toimittajien luokittelun välineenä esittelemällä kohdeyrityksen esimerkin.

ABSTRACT

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Classification of suppliers has become an increasingly important topic as in the constantly changing business environment efficient management of suppliers is required, while also characteristics of purchases and circumstances of buyer-supplier relationships need to be considered. Moreover, companies are always to some extent dependent on the resources of other organizations, which creates differences in terms of power and dependence relations between companies. These power and dependence relations affect how different suppliers should or could be managed. The purpose of this master's thesis was to describe how suppliers can be classified and therefore managed optimally by using portfolio model, while taking into account both characteristics of purchases and the existing power and dependence relations to suppliers.

The study was conducted as a single case study with focus on one selected business unit of the case company operating in the industry of defence, security and aviation. The nature of the study was qualitative, and data was mainly collected through five semi-structured interviews of the procurement organization at the business unit. Additionally, data was gathered through observation in addition to case company's websites, intranet, ERP and existing documents such as different guidelines.

The application of suggested portfolio model was described through three steps. First, the purchases of the case company were analyzed based on their profit impact, meaning the financial significance of the purchase and supply risk, meaning the complexity of the purchase. In order to evaluate profit impact and supply risk, company-specific set of factors describing these was determined. Based on these factors suppliers can be positioned into the portfolio and thus be classified. Next, different sources of power and dependence were identified in order to determine power relation between companies and thus evaluate the nature of the supplier relationship. Finally, based on these analyses action plans to manage different groups of suppliers were suggested. Therefore, the study provided case company a model for classification of suppliers and guidelines to manage these suppliers. Consequently, this study enhanced the understanding of applying a portfolio model as a supplier classification tool by presenting the example of the case company.

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As I write these final words, my time at LUT University comes to the end. The past five years have been full of late nights doing assignments and early mornings at the lecture halls, but most importantly these years have been full of laughter and learning. Despite all the current uncertainties in the world, I feel prepared, confident and excited to see what the future has to offer.

First, I want to thank my family and friends for continuously supporting me through this journey. Special thanks to my parents for always believing in me, and to Eetu for being there when most needed. Without all the love and support, I wouldn't have finished this process. I want to thank also my case company for this great opportunity and all the interviewees for the valuable insights provided inside and outside interviews, without them this wouldn't have been possible. Finally, I want to thank my supervisor Katrina Lintukangas for encouraging guidance and precious feedback, which has greatly helped me to improve and finish my master's thesis.

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1. INTRODUCTION

This paper begins with a brief introduction to the background of the study. This is followed with presentation of research objectives and limitations. Next, the research questions are presented. After this, data collection and research methodology are discussed. Then, theoretical framework and key concepts of the study are explained. Finally, there's an outline of the study.

1.1. Background of the study

Due to the constantly changing business environment, the strategic role of supply management has increased (Ahtonen 2009, 263). Moreover, the need for strategic management of interorganizational relationships has been increased due to increased amount of outsourced activities (Paulraj & Chen 2007, 29). This is no wonder, as it has been acknowledged, that suppliers and supplier relationships are a main part of the company's supply strategy (Ahtonen 2009, 268). Furthermore, supplier relationship management has become a crucial business process due to numerous factors such as competitive pressures, needs for cost efficiency or needs for development of closer relationships with key suppliers (Lambert & Schwieterman 2012, 337). Effective and efficient management of a portfolio of supplier relationships is required in order to successfully manage the supply chain. This means that in each interaction the type of relationship must be chosen in a manner it is appropriate in terms of product and market conditions. (Bensaou 1999, 35, 37) Furthermore, organizations need to select appropriate strategies for each relationship while considering numerous factors such as power, risk, dependence and relational capacity (Meehan & Wright 2011, 33).

It has been stated that not all buyer-supplier relations should be managed similarly (Gelderman & van Weele 2002, 30). For example, Olsen and Ellram (1997, 101) argue that the literature regarding buyer-supplier relationships has a tendency to ignore the important task of allocating company's limited resources between relationships. Similarly, Bensaou (1999, 35) states that, management practices must be adapted to each relationship in order to ensure the effectiveness and efficiency. Thus, there is need to differentiate the supplier relationships from each other to manage them in an optimized manner.

Purchasing portfolio models have received remarkably attention in the previous literature (see e.g. Caniëls & Gelderman 2005, 141). Despite the criticism towards the use of portfolio models, they can be useful tools to analyze and organize the information and create a classification framework (Olsen & Ellram 1997, 103). Purchasing portfolio models aim to develop and differentiate purchasing strategies (Gelderman & van Weele 2002, 30). For example, characters of the items can be used as the basis for decisions concerning supplier relationship strategies (Ahtonen 2009, 269). Moreover, purchasing portfolio model presented by Kraljic in 1983 has been recognized as the dominant approach in the field of purchasing portfolios (Gelderman & van Weele 2002, 30; Gelderman & van Weele 2003, 207). It has had a major impact on professional purchasing in addition to inspiring other researchers to undertake further study into the field of portfolio models. (Caniëls & Gelderman 2005, 141) Thus, it provides a good basis for supplier classification.

In managing supplier relationships, instead of concerning only what is optimal, buying organization must also regard what is possible given the power and leverage circumstances (Cox 2004, 346). As a solution to this, resource dependence theory has been widely accepted to support the discussion of the relationships between organizations (Medcof 2001, 1002). Based on existing literature, resource dependence theory is regarded as a primary theoretical perspective to understand inter-organizational relationships such as buyer-supplier relationships. (Hillman, Withers & Collins 2009, 1404, 1406)

Yet, there's need to examine the power and dependence positions of buyers and suppliers and especially how they affect the way relationships are approached. From the purchasing portfolio perspective, more empirical study is desired regarding how power and dependence effect in buyer-supplier relationships. (Caniëls & Gelderman 2005, 142) Moreover, actual use of portfolio models requires more empirical research in terms of how suppliers are positioned into the portfolio, how strategies are developed and what are the results of using portfolio model in purchasing (Gelderman & van Weele 2002, 30-31).

In terms of literature regarding supply management in defence and aerospace industry, it seems to be lacking especially in the field of supplier relationship management. This may be due to the fact that research often contains sensitive information and is therefore restricted from public access. However, it is the focal company as the service provider who selects its own subcontractors to be used and is responsible for the delivery of the contract. (Bankole, Roy, Shehab, Cheruvu & Johns 2012, 405, 413) Hence, the issue of managing these suppliers should be studied in the context of the industry. This study provides insight,

how purchasing portfolio can be applied to not only develop a practice for classification of suppliers, but also to giving guidance on how these relationships should be managed while taking into account what is appropriate in terms of power and dependence in the relationships. Moreover, this study provides an empirical example on the issue.

1.2. Research objectives and limitations

The purpose of this study is to describe how suppliers can be classified by using portfolio model, while taking into account the existing power relations and dependency on suppliers. This includes considering the special, even unique characteristics of the company that have an impact on the supplier relationships and in the way they are managed. Furthermore, this thesis aims to apply an SRM portfolio model which can be used to manage the supplier relationships in the most optimized manner, and which gives guidelines on what kind of actions are required with each supplier group.

In order to achieve the aims of the research, a set of research objectives are presented to support the research process. First objective is to examine what are power and dependence in a buyer-supplier relationship and how these issues affect the relationship. Another objective is to describe supplier classification as a part of supplier relationship management practice and moreover to study the use of portfolio models in the context of supplier classification. Final objective is to determine based on the power and dependence and classification of suppliers, how different suppliers should be managed. To conclude, the purpose of the study is to examine how to develop such a supplier classification practice in this particular case.

There are also number of limitations in the study. In terms of unit of analysis, the focus is on dyadic relationship between the buying company and its suppliers. This is justified because narrow focus allows to study deeper, which is essential in order to build understanding on the issue more in detail. Moreover, the dyadic relationship has been argued to be the fundamental basis of all business transactions and should therefore be understood before expanding the view. (Cox 2004, 347) Yet, the angle of the study is merely from the buying company's point of view.

Some limitations are related to the theoretical perspectives of the study. In terms of supplier relationship management process, focus is only on the stage of classification and on

developing action plans regarding how the current relationships should be managed. Therefore, for example supplier selection or the contracting process are not discussed in this study. In supplier classification tools, the main focus is on portfolio models as they have been recognized as they can be useful tool to analyze and organize the information and create a classification framework (Olsen & Ellram 1997, 103). Moreover, main focus is on the model presented by Caniëls and Gelderman (2005, 143), as it takes into account also power and dependence perspective, which is regarded as a primary theoretical perspective to understand inter-organizational relationships such as buyer-supplier relationships (Hillman et al. 2009, 1404, 1406).

Being a single case study, this paper is limited to one company, but more specifically it is limited to one particular business unit and its purchasing department. Results of the study will be valid mainly in the examined business unit but provide valuable insights also in other business units of the case company as well as other companies of the group. Additionally, results could be partly applicable in similar companies in the Nordic and to some extent in other companies working with the public sector. Sensitive and special nature of the industry, in addition to unique characteristics of the case company, narrow down the contexts where the results may be valid.

1.3. Research questions

Main research question of the thesis is based on the given assignment by case company to find a suitable supplier classification practice which gives action plans on how to manage the suppliers, but since power relations and dependence have a fundamental role in this study, the relationship of these two aspects needs to be considered:

“How suppliers can be classified and managed by using portfolio model, while taking into account the existing power relations and dependency on suppliers?”

The research question addresses the issue of building an appropriate supplier relationship management practice by acknowledging the power and dependence in buyer-supplier relationship and by utilizing portfolio models and based on this providing action plans on how these relationships should be managed. As the basis for this, portfolio model presented by Caniëls and Gelderman (2005, 143) is applied, since it takes into account also power and dependence perspective.

In order to support main research question, three sub-questions were developed. These sub-questions are constructed to be easier to approach and thus help to provide an answer to the more complex main question. First sub-question is:

“What kind of factors can be used to classify suppliers in the portfolio?”

This question addresses the issue of defining the aspects on the portfolio, meaning that based on what factors suppliers are grouped to certain segments. Since the basis for portfolio model is the one presented by Caniëls and Gelderman (2005, 143), the dimensions are profit impact and purchase risk. However, it is required to define what kind of factors are relevant in each dimension in order to classify suppliers in manner it provides useful information. Second sub-question is:

“How to apply aspects of power and dependence to supplier management practice?”

In terms of power and dependence, it is first necessary to study what power and dependence mean in the buyer-supplier relationships and what are the sources of it. After this, it can be assessed how these aspects should be applied to the management of suppliers. Finally, the third sub-question is:

“How portfolio model can be used as a basis for managing supplier relationships?”

This question addresses the issue of applying the selected portfolio model to supplier relationship management. This includes the steps of classifying the suppliers based on set parameters and then finally providing the action plans on how to manage different supplier segments, given the limited resources and other interests.

1.4. Data collection and research methodology

Since this study has only one investigated object, it is a single case study focusing on the selected business unit of case company. Moreover, case study is appropriate and even essential research strategy as environmental context is different to the existing theory (Stuart, Mccutcheon, Handfield, Mclachlin & Samson 2002, 423). The nature of the study is

qualitative as it examines the presented concepts in terms of their meaning and interpretation in this kind of specific context (Ketokivi & Choi, 2014, 233).

Primary data is collected through five semi-structured interviews of the procurement organization. Interviewees were from different positions, both from strategic sourcing and operational purchasing. This provided diverse set of insights and therefore more versatile data. Interview form was the same for every interviewee regardless of their position and included themes of supplier relationship management, power and dependence in relationships with suppliers and supplier classification. The interview form was originally created in English, but since interviews were held in Finnish, also the questions were translated. Interviews were held in Finnish in order to ensure interviewees understanding the questions and to be able to have a smooth flow of conversation.

Secondary data was gathered through observation in addition to case company's websites, intranet, enterprise resource planning system and existing documents such as different guidelines. Observation was practiced throughout the thesis process in numerous formal and informal meetings in the case company. Some of the secondary data such as data from the enterprise resource planning systems (ERP) of the case company is numerical, but it is still utilized in a qualitative manner.

1.5. Theoretical framework and key concepts

Theoretical framework of the study is presented in Figure 1. It describes how power and dependence, further explained through resource dependence theory provide the theoretical background for understanding the management of supplier relationships and more specifically the classification of suppliers. Supplier classification in turn is discussed through application of portfolio model. Finally, based on consideration of these factors it is possible to form an appropriate supplier relationship management practice. The appropriate supplier relationship management practice is therefore taking into account power and dependence perspective in the buyer-supplier relationships and after the supplier relationships are classified based on the portfolio model, optimal management practice with action plans can be presented.

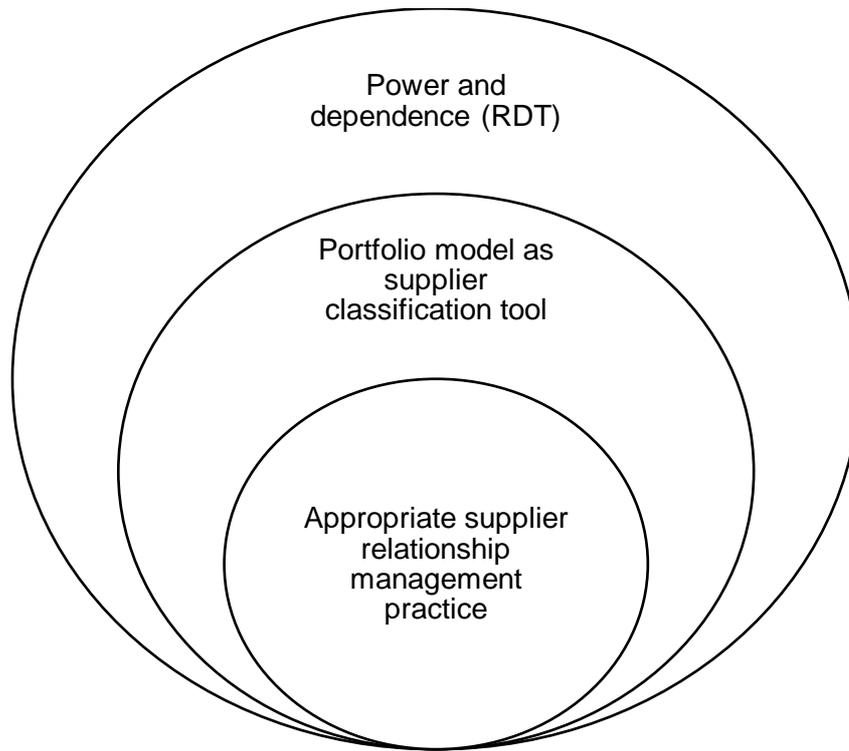


Figure 1. Theoretical framework of the study.

Concepts of power and dependence are widely recognized to be important for understanding buyer-supplier relationships and it has been argued that portfolio models even seem to assume the occurrence of differences in power and dependence between buyers and suppliers (Caniëls & Gelderman 2007, 219). As discussed, resource dependence theory (RDT) is regarded as a primary theoretical perspective to understand inter-organizational relationships such as buyer-supplier relationships. Despite the value it offers, resource dependence theory doesn't completely explain interorganizational relationships. (Hillman et al. 2009, 1406-1407) Therefore, another theoretical aspect is required to support it. For this, portfolio models as supplier classification tools will help to fill the gap. Portfolio models may be used to create a classification framework of the items, such as purchases or supplier relationships (Olsen & Ellram 1997, 103). Portfolio analysis has been identified as an important tool particularly for discussing, visualizing and illustrating the possibilities of purchasing and supplier strategies (Gelderman & van Weele 2002, 36). Therefore, portfolio model is highly applicable for development of appropriate supplier relationship management practice.

After presenting the theoretical framework of the study, it is necessary to discuss further the key concepts in it. These concepts have a fundamental role in the study and therefore they should be understood in the context of the study. Thus, themes of power and dependence, supplier relationship management, supplier classification and portfolio models are briefly defined and explained from the viewpoint of this study. These concepts will be discussed more in detail in the theoretical part of the study.

Power and dependence. Dependence in buyer-supplier relationship refers to the manner how companies are dependent on the resources of others. These dependencies create power balances between parties. In principle companies try to reduce others' power over them and increase their own power over others (Hillman et al. 2009, 1404). Then again power refers to what kind of impact one party has on another. Caniëls and Gelderman (2005, 142-243, 151) argue that power positions should influence the choice of supply strategy and the way how supplier relationships are managed.

Supplier relationship management (SRM). Moeller, Fassnacht and Klose (2006, 73) define supplier relationship management as a process of engaging in activities with suppliers to create and enhance value within relationships. Similarly, Lambert et al. (2012, 337) argue that SRM provides a structure how supplier relationships are developed and maintained. Combining these two definitions, the definition of supplier relationship management in this study is that SRM is a process of maintaining and developing supplier relationships.

Supplier classification. Supplier classification refers to the part of the supplier relationship management process, where suppliers are grouped based on the selected factors. Criteria may include factors such as profitability, growth and stability, criticality, supplier's technology capability and compatibility, purchased volumes or supplier's culture of innovation (Lambert et al. 2012, 342). For example, Hallikas, Puumalainen, Vesterinen and Virolainen (2005, 73) argue that in order to manage suppliers efficiently, distinct practices for different suppliers are required. In principle, classification can be based on the continuum approach or portfolio approach.

Portfolio models. Portfolio models concentrate on categorizing items such as products or supplier relationships. Additionally, portfolio models often suggest action plans. (Olsen & Ellram 1997, 102) In terms of purchasing portfolio models, these usually aim to develop and implement differentiated purchasing strategies (Gelderman & van Weele 2002, 30).

Combining these definitions, it can be argued that in the context of supplier relationship management, portfolio models are tools that are used to classify purchases or supplier relationships and based on the categories action plans to develop and implement strategy on these relationships.

1.6. Outline of the study

The study is structured as follows. After the introductions there's theoretical section which includes two parts. First part regards power and dependence perspective in buyer-supplier relationship by discussing the themes of power and dependence in addition to presenting resource dependence theory. Power and dependence will be discussed further through definitions of the concepts, as well as sources and effects of power and dependence in buyer-supplier relationship. Resource dependence theory is discussed by presenting main principles behind the theory and by describing what resources are. Second theoretical part focuses on supplier classification and portfolio models. First, the characteristics and importance of supplier relationship management will be discussed. Then, supplier classification will be presented as a part of SRM process in addition to different classification practices. Finally, portfolio models as supplier classification tools will be addressed by presenting significant portfolio models from previous scholars, the application of portfolio model and also power and dependence in portfolio models will be discussed.

After the theoretical part, research design will be discussed. Chosen methodology as well as data collection and analysis methods are presented and justified. This is followed with the empirical section of the study. Empirical part begins with describing the background of the case as it gives context for the findings. Then, current state of supplier relationship management in the case company is briefly analyzed. After this, power and dependence in case company's supplier relationships are discussed through sources of power and dependence. This is followed with analysis of the purchases based on the assessment of factors regarding profit impact and supply risk. Finally, based on the assessments of purchases as well as sources of power and dependence, supplier classification model is proposed by applying a portfolio model. The use of the proposed portfolio model is explained and illustrated.

After this, the study proceeds to discussion and conclusions. First, theory is reflected to empirical findings to find similarities and differences. Then, research questions will be

answered, and managerial implications of the study will be discussed. After this, reliability and validity of the study are evaluated. Then, limitations and propositions for future research are addressed and finally the conclusions of the study are presented.

2. POWER AND DEPENDENCE PERSPECTIVE IN BUYER-SUPPLIER RELATIONSHIP

In this chapter, power and dependence will be discussed in the context of a buyer-supplier relationship. This includes defining what power and dependence are, what are their sources in a buyer-supplier relationship and how they impact buyer-supplier relationships. In addition, resource dependence theory (RDT) will be presented and it is described what resources are.

2.1. Power and dependence in buyer-supplier relationship

Due to the trend of outsourcing, the importance of supplier relationships has increased, making also the theme of power interesting in the literature of supply management (Emerson 1962, 32; Gelderman & van Weele 2004; Cuevas, Julkunen & Gabrielsson 2015, 149) Moreover, the externalization of activities has increased companies' dependence on the resources and capabilities of other's (Svahn & Westerlund 2009, 173). It has been stated that all buyer and supplier relationships take place in the environment of relative buyer and supplier power (Cox 2001b, 9). Furthermore, it could be said that in principle, companies always depend on their trading partner to varying extents. Not only may buying organization be dependent on its suppliers, but also suppliers can be dependent on their buyers. Moreover, in the case of dependence, companies must develop and maintain relationships with the parties controlling these resources and capabilities in order to ensure access to such essential resources (Buchanan 1992, 65). Thus, it is argued that power is a significant dimension of relationship since it can control and direct counterpart's actions. Moreover, power impacts on how buyer-supplier relationships are developed and who leads the development. (Meehan & Wright 2013, 1245-1246) Similarly, Cox, Lonsdale, Watson, and Qiao (2003, 135) have identified power as a critical concept to affect the way buyers and suppliers interact with each other but also to determine the situations when the buyer is able to develop the type of interaction. Therefore, concepts of power and dependence are widely recognized to be important for understanding buyer-supplier relationships (Caniëls & Gelderman 2007, 219). Likewise, Cox (2004, 346) argues that companies need to first understand the power and leverage circumstances in order to understand how to manage the relationships they have.

When discussing power, it is necessary to specify the nature of the power structure and its conduct. There are different forms and structures of power in addition to different ways of exercising the power, if it is even exercised. (Kumar 2005, 864) Research regarding power has typically behavioral or structural perspective. However, Cendon and Jarvenpaa (2001, 121, 125) argue that instead of viewing these as alternative approaches, the two perspectives should be addressed more as complementary. Therefore, since behavioral approach focuses on exercising the power and power tactics while structural approach focuses on the sources of the power which are the factors enabling one to acquire and possess power, both of these aspects will be discussed further in order to gain comprehensive understanding of power perspective in buyer-supplier relationship. However, first power and dependence will be defined in the context of buyer-supplier relationships to create basis for building understanding.

2.1.1. Defining power and dependence

Due to the fundamental consequences to business success, power is at the heart of all buyer-supplier relationships (Cox 2001b, 9). However, defining power has been stated to be complex (Chicksand 2015, 123). Next, some existing definitions of power and dependence will be presented, followed with discussion of the relationship between these themes and how they take place in buyer-supplier relationships.

Power refers to one's ability to control or influence the behavior of another (Hunt & Nevin 1974, 186). Moreover, power is typically regarded as one's ability to cause someone to do something they wouldn't have done otherwise (Gelderman & van Weele 2004). Similarly, McDonald (1999, 49) defines exercise of power in social interactions as the ability to place one's wishes or interests above those of others. Emerson (1962, 32) defines power as a potential influence as follows: "The power of actor A over actor B is the amount of resistance on the part of B which can be potentially overcome by A." Meehan and Wright (2011, 32) simplify the definition and define power as "the potential to influence". Stannack (1996, 51) defines supply chain management power as "the capacity to optimize the behavior of suppliers and subcontractors in accordance with desired performance objectives" and purchasing power as "the capacity to achieve a successful negotiated contractual outcome on behalf of an organization. Power is therefore considered fundamental in understanding by which one party in a supply chain can change or modify the behavior of another party. (Hunt & Nevin 1974, 186).

Power is seen to be closely related to dependence (Pfeffer & Leong 1977, 788). Buchanan (1992, 65) defines dependence as “the extent to which a trade partner provides important and critical resources for which there are few alternative sources of supply”. Dependence doesn’t explain power completely, but it is still recognized as an important theme in the discussion of power (Stannack 1996, 48, 51). Moreover, it has been argued that one’s dependence provides the basis for the power of the other (Emerson 1962, 32). Due to dependence in the relationship, there are constraints in the freedom of choice of actions. However, dependency in a relationship is only natural as companies are by nature dependent on their environment for the supply of needed resources. (Gelderman & van Weele 2004)

Power relations can be accurately portrayed as one’s power capability in relation to other and vice versa (Casciaro & Piskorski 2015, 170). Furthermore, power relation is the relation between two actors based on their power sources, thus it can be regarded as a power balance between power position of buyer compared to the power position of the supplier (Kähkönen 2014, 20). In structural theories of power is an assumption of fixed sum of power in the relationship (Cendon & Jarvenpaa 2001, 124). Therefore, it is only the balance that shifts as the total amount of buyer power and supplier power is fixed (Kähkönen 2014, 20). Power relation determines the kind of structural conditions under which the company will be able to reconstruct the dependencies (Casciaro & Piskorski 2015, 179).

As said, a close relationship between power and dependence has been identified since in an exchange relationship the relative dependence between two parties determines their relative power (Gelderman & van Weele 2004). Likewise, Chicksand (2015, 123) argues that the relative power of a buyer over a supplier may be determined based on the degree of resource dependence. Yet, in order to succeed in this, it is necessary to understand the relationship from the point of views of both buyer and supplier. Thus, relative power may be defined based on the net dependence, meaning that in case where both parties are dependent on each other, the one who is less dependent than the other has power over the other. (Caniëls & Gelderman 2005, 143; Caniëls & Gelderman 2007, 220-221) This is illustrated in Figure 2 below in an example, where buyer’s dependency on supplier is bigger than supplier’s dependency on buyer, resulting in supplier having power over the buyer.

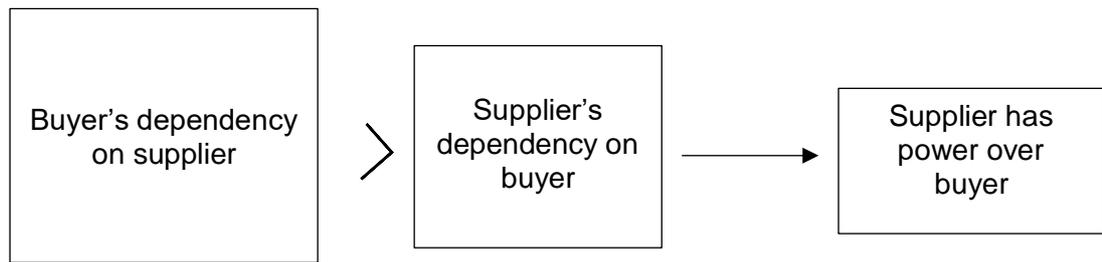


Figure 2. Illustrative example of dependency.

Relationship's symmetry may be determined based on the extent to which parties value each other's resources, meaning that if resources are valued equally, the relationship can be described as symmetric and if resources are valued unequally, meaning that one values more than the other, the relationship can be described as asymmetric. In terms of dependence, this means that less dependent party is the dominant one in this relationship. (Buchanan 1992, 65) Moreover, based on the definition of power, it is possible to separate two aspects of power imbalance and mutual dependence. Power imbalance refers to the existing difference in the power of two parties, in other words more powerful actor's power ratio to that of the less powerful actor. Furthermore, power imbalance can be defined as the difference between dependencies of two parties. Then again mutual dependence refers to both parties being dependent to some extent, however not necessarily meaning that parties are equally dependent. Mutual dependence can be defined as the sum or average of parties' dependencies of each other. (Casciaro & Piskorski 2015, 170).

Consequently, Cox (2004, 352) has introduced four generic power structures that are possible in a buyer-supplier relationship. These are presented in Figure 3 below. First one is buyer dominance, which is the case when buyer's power is over supplier's power. As has been explained, the opposite is supplier dominance, which derives from supplier's power over buyer. However, if both parties have low relative power, there is independence between buyer and supplier. This means that there are many buyers and suppliers in the market and the parties aren't in such a situation they would need each other to the extent there would be dependent on each other. The opposite of this is interdependence, where both buyer and supplier have high power over other, which also means that they are both highly dependent on each other. This could be due to for example on low number of actors in the field.

Buyer's power	High	Buyer dominance	Interependence
	Low	Independence	Supplier dominance
		Low	High
		Supplier's power	

Figure 3. Buyer-supplier power matrix (adapted from Cox 2004, 352).

Pettigrew and McNulty (1995, 851) remind that power is a relational phenomenon as it exists in the context of relationships with others. They describe power to involve affecting others in accordance with their own perceived interests. Likewise, Gelderman and van Weele (2004) argue that organizations are powerful only with respect to the specific relationship with other party they have power over, not powerful in general. Moreover, power in buyer-seller interactions is temporal and contextual in its nature (Meehan & Wright 2011, 32). Thus, it can be stated that power isn't an attribute of a company, it exists only in the relationship (Emerson 1962, 32). Additionally, Casciaro and Piskorski (2015, 171) argue that it is important to consider power dyadically, that is by taking into account the dependence of both parties on each other.

2.1.2. Sources of power and dependence in buyer-supplier relationship

In order to be able to understand the most appropriate ways of managing supplier relationships, companies need to understand the power circumstances existing in those relationships (Cox 2001a, 43). Possession of power is identified to be critical, as it may control and direct actions of the parties (Meehan & Wright 2012, 669). Moreover, in the dyadic relationship between buyer and supplier power sources of the parties of the relationship are compared, which determines their power relation. (Kähkönen & Virolainen 2011, 111-112) Next, sources of power and dependence in a buyer-supplier relationship are discussed further. It should be acknowledged that these factors are always company-specific and related to many characteristics of a company as well as combinations of these

characteristics. In addition, as has been previously discussed, power is relationship-specific, temporal and contextual (Gelderman & van Weele 2004; Meehan & Wright 2011, 32), suggesting that also the sources of power vary similarly. Thus, presenting a specific, inclusive list is impossible. However, different types and examples of sources can be discussed.

Sources of power are the factors which enable companies to acquire and possess power (Cendon & Jarvenpaa 2001, 125). There are three recognized schools of thought regarding the origins of power. First one, which is dominant in the research of purchasing and supply chain, considers power as a property of organizations, meaning that companies themselves are the source of power. The second school recognizes power resultant from individual buyers or sellers, indicating that the personalities and competences of these individuals attribute to the power. The third school regards power as an attribute of the relationship through the relational exchanges. However, in order to consider sources of power in a meaningful and useful manner, these schools of thoughts should be integrated. (Meehan & Wright 2012, 669)

In structural perspective of power, which focuses on the sources of power, power is identified to derive from organizational structures, including resources, interconnections among actors as well as organizational positions (Cendon & Jarvenpaa 2001, 123). Resources have been identified as a significant source of power by many scholars. For example, Medcof (2001, 1002) states that power of the organization is based on the resource dependency relationship it has with other organizations. In addition, Cox (1999, 173) regards resources that company owns and controls as power attributes. Similarly, Dryer et al. (1998, 68) argue that buyer can achieve bargaining power from having more alternative sources of supply, but it could also be increased by increasing purchases from a single supplier which makes the supplier more dependent on buyer. Moreover, Chambolle and Villas-Boas (2015, 63) present that buyer power may be derived from the differentiation of suppliers, however possibly at the cost of quality. It can be concluded that power is acquired by actors who are able to obtain resources that are critical to the company. (Cendon & Jarvenpaa 2001, 123).

Interconnections refer to how extensively one's activities are connected with others', as high degree of connections may cause more dependencies from other organizational factors. Moreover, actor should become more powerful by collaborating with other units of the organization. Organizational position includes hierarchical level, one's span of control over

others and positioning as a core or support unit of the organization. (Cendon & Jarvenpaa 2001, 123). Cox (1999, 171) discusses how position in supply chain presents a source of power and if one achieves a position where other actors can't leverage value from them while they can leverage others, one's position presents the kind of situation where they have power over others.

There are also other ways to categorize potential sources of power. McDonald (1999, 49) argues that there are main four sources enabling exercise of power in supplier relationship. First is control of information, which refers to the fact parties may become dependent on each other due to the control over strategically important knowledge. Similarly, dependence may stem from strategically important technology. Then again, if buyer possesses a high share of the total sales revenue of suppliers, they will have power over the suppliers. Finally, power may stem from the market power of the party. Stannack (1996, 53) presents that indicators of power can be assessed in terms of attribution and effects. Attribution refers to factors such as number of employees and turnover, which indicates the company's size. Effects include factors which company can affect with their power, including shift in delivery times, costs and quality. Cox (2001b, 14) presents multiple sources of power, including number of buyers and suppliers, portion buyer has on supplier's market share and revenue, number of available alternatives, switching costs from finding a new trading partner, buyer's account's attractiveness to supplier, supplier's offerings characteristics and attractiveness to buyer for example is it standardized or customized, and finally information asymmetry. Similarly, Dryer et al. (1998, 68) have implied that supplier's dependency is high if significant share of their market comes from the specific buyer. This makes supplier's revenue dependent on the buyer's purchases. Additionally, if supplier's switching costs are high, meaning that it is expensive for them to acquire new customers, they are dependent on the buyer. (Cox 2004, 352)

Based on the definition of dependence, Buchanan (1992, 65) points out that main elements of dependence are supply of important and critical resources but also availability of alternative sources of supply. Consequently, Gelderman and van Weele (2004) discuss that there are two factors causing dependence. First is the importance of the resource, which is based on its relative financial magnitude and criticality. Relative financial magnitude of an exchanged resource can be assessed for example based on the proportion of the total purchases. Then again, criticality of the resource may mean different things, but typically it refers to indispensability of a resource, which from buyer's point of view would refer to the need for the resources of a supplier to the extent that disrupted flow of supply would cause

issues for the functioning of the organization. In terms of substitutability of source, it can be divided to availability of alternative sources and switching costs. Access to alternative sources of supply reduce dependence, but in case the availability is limited the dependence is increased. Switching costs address the issue that even if there are alternative sources of supply available, there may be high costs or other difficulties concerning the change of current trading partner. Moreover, these difficulties to deploy alternative sources are typical in terms of more specific resources. By using multiple suppliers, company can avoid becoming dependent on any specific supplier (Svahn & Westerlund 2009, 174). However, buyer's dependence is increased due to the fact they need the expertise, capabilities and resources of their suppliers (Gelderman & van Weele 2004).

Table 1. Sources of power and dependence.

Authors	Identified sources of power and dependence
Buchanan (1992)	Resources, substitutability of source
Cendon & Jarvenpaa (2001)	Resources, interconnections, organizational position
Chambolle & Villas-Boas (2015)	Differentiation of suppliers
Cox (1999)	Position in supply chain, resources
Cox (2001b)	Number of actors, portion of market share, share of revenue, number of alternatives, switching costs, attractiveness, characteristics of offering, information asymmetry
Gelderman & van Weele (2004)	Importance of resource, substitutability of source
McDonald (1999)	Control of information, control of strategically important technology, possession of a high share of revenue, market power
Stannack (1996)	Attribution, effects

Some sources of power and dependence identified based on the literature have been summarized to Table 1 above. Furthermore, Kähkönen and Virolainen (2011, 111-112) have discussed sources of structural power in the different levels of analysis such as the organization, the relationship but also the network. Sources of structural power on an organizational level include factors such as positional resources, financial resources,

expertise, uniqueness of resources, importance of resources, brands, legitimacy, company's size, economic base and combination of other factors such as product characteristics. Then, relationship-level sources of power consider factors such as market power, dependence on other actors, switching costs, alternative sources of supply available, type of product, experience and control of important technology. Network-level sources of power consist of number, roles and positions of actors in addition to level of domination. These factors are consistent with the findings from other researchers. From these factors, significance of market power, the volume of purchases, the number of available alternatives and substitutes, the type of product in addition to resources, capabilities and competencies owned by the companies are highlighted as determinants of source of power in the existing literature (Kähkönen 2014, 18). Yet, as mentioned, the relevancy of different factors varies between different relationships. What is important, is to be able to recognize them.

2.1.3. Effects and use of power and dependence in buyer-supplier relationship

Research in the area of how power and dependence affect buyer-supplier relationships is scarce, however power and dependence seem to impact the way buyers interact with their suppliers and how different supplier relationships are managed (Caniëls & Gelderman 2005, 142-143, 151). Likewise, Cox (2004, 346) has stated that power and dependence need to be understood to manage suppliers efficiently. Moreover, power affects to what extent buyer can develop supplier to the direction it wants and needs and additionally understanding power helps purchasing organization to understand what kind of possibilities it has when working with the suppliers (Cox et al. 2003, 135). However, assessing the status of the relationship accurately may be difficult (Meehan & Wright 2013, 1247). To succeed, sources of power and dependence may be identified as presented in previous chapter. Next, it will be discussed further how power and dependence affect buyer-supplier relationships and how power can be used.

Cox et al. (2003, 141) have argued buyer-supplier power to affect buyer-supplier relationships in two ways. Firstly, it effects on how the surplus value is shared as in case of interdependence the value is likely to be shared but otherwise the dominant party usually keeps the value. Second, buyer-supplier power affects to probability of forming a collaborative relationship. Remarkable is that if supplier is dominant in the relationship, buyer is unlikely to be able to create a collaboration if supplier isn't interested as it wants to invest its resources elsewhere. By understanding the power balance in the relationships

allows companies to form appropriate types of relationships, for example in order to establish a successful partnership interdependence seems like a good starting point (Chicksand 2015, 128). On the other hand, it has been acknowledged that buyers shouldn't invest too much in the personal relationship with their suppliers in supplier-dominant markets (Gelderman, Semeijn & De Zoete 2008, 226).

However, Wang, Wang, Jiang, Yang and Cui (2016, 5587) argue that there are contradictory findings in the literature regarding how power asymmetry affects long-term collaboration. From one point of view it seems that since power-advanced companies obtain their own interests through exercising power over the weaker party, they are less likely to develop long-term development. On the other hand, it has been presented that in some cases power symmetry may actually promote collaborative behavior. Kumar (2005, 863) states that it is possible to have trusting relationships with asymmetric power structures. However, power imbalance may prevent intensive collaboration as the actor in a dominant position may not be willing to form collaborative relationships with other actors (Kähkönen 2014, 25-26). However, some argue that it is false expectation to assume that power symmetry would always foster the development of well-trusted relationships or similarly that in the case of power asymmetry the opposite would occur (Cuevas et al. 2015, 149). Moreover, Kähkönen (2014, 25-26) has discussed how actors' power positions in addition to the willingness to use power are factors to define the influence of power on collaboration. This means that source or possession of power won't alone define the nature of the relationship. Instead, the willingness to use it and to exploit one's position of power has been identified to be a significant determinant. Yet, it has been stated to be outdated to view dependence on other actors as a negative aspect which reduces the power over others, in fact high mutual dependence may even lead to lower conflicts in addition to higher trust and commitment in a relationship (Kumar 2005, 864).

The party possessing power, that is the dominant party may exercise the power through coercive or non-coercive influence tactics. Coercive or punitive actions include threats and punishments, whereas non-coercive tactic includes actions such as promises, information exchange, discussion of business strategies and request. (Kumar 2005, 865). If the dominant party decides to use coercive strategy, they should consider also potential impact within and outside the relationship as the strategy may be viewed and experienced differently by the counterpart (Gelderman et al. 2008, 226). It has been acknowledged that abuse of power can be regarded as a destructive force. However, power isn't exclusively a negative factor used to take advantage of the counterparty. (Hingley 2005, 856)

Additionally, even if resources, and more specifically money may seem like an obvious basis for exercising power, Stannack (1996, 56) reminds that while money can be used to gain compliance, it cannot buy commitment.

McDonald (1999, 50) discusses that the size of the parties doesn't necessarily affect the exercise of power or the creation of power balances between buyers and suppliers. Moreover, it is argued that power imbalances may exist in relationships regardless of the sizes of the companies. However, large companies tend to have better access to information, advanced technologies and larger shares of total sales revenue in addition to significant levels of market power. Thus, it can be stated that the size of the company may affect the capability to actually utilize power. However, even if one has power over others, it doesn't necessarily mean that they are going to exploit the counterpart. For example, Pettigrew and McNulty (1995, 841) remind that not all behavior is self-interested. In fact, dominant party isn't necessarily even aware of their placement in the structures.

To conclude, power and dependence may affect relationships in numerous different ways. Of course, buyer's power can be used for example to reduce costs (Park, Shin, Chang and Park 2010, 500), or to benefit in some other way through coercive or non-coercive influence tactics (Kumar 2005, 865). However, there are also other, more strategic ways power and dependence may affect the relationship. As discussed, power and dependence can be used to guide the forming and developing of relationships, especially when considering whether to form partnership or not. Yet, as power is such a versatile concept, also the effects of power and dependence may vary due to different environmental factors such as the industry. It has been identified that in some supply chains, such as in the field in aerospace, the power regime is willing to respond to proactive supply development. This kind of circumstances typically require that the power regime is structured based on either buyer dominance or buyer-supplier interdependence. (Cox 2001a, 46) However, Cuevas et al. (2015, 149) have found that in the case of aerospace company increasing power symmetry actually developed the relationship towards an adversarial relationship, which is characterized with low levels of trust.

2.2. Resource dependence theory (RDT)

Resource dependence theory (RDT) was presented by Pfeffer and Salancik in 1978, and it has been widely cited ever since (Casciaro & Piskorski 2015, 167). It is one of the

fundamental concepts in the management of external resources. Moreover, in supply management resource dependence theory can be regarded as a basis for supplier relationships and as theoretical background of supplier relationship management as it helps to discuss relationships between organizations (Medcof 2001, 1002). In fact, resource dependence theory has been recognized as one of the most influential theories in organizational theory and strategic management. Resource dependence theory is regarded as a primary theoretical perspective to understand inter-organizational relationships such as buyer-supplier relationships. (Hillman et al. 2009, 1404, 1406) Next, the principles of resources dependence theory will be discussed further in detail. After that, concept of resources will be discussed in order to gain more comprehensive view on the topic.

2.2.1. Principles behind RDT

The main principle is that organizations are dependent on the resources of other organizations. Resource dependence theory assumes that only a few organizations are self-sufficient in terms of strategic and critical resources, which leads to dependence on other organizations. (Paulraj & Chen 2007, 30) Dependence in buyer-supplier relationship refers to the manner how companies are dependent on the resources of others. Organization will have power over other if the other is highly dependent on it for an important resource. Therefore, according to RDT, power of an organization is based on the resource dependence relationships it has with others. (Medcof 2001, 1002)

The fundamental statement of resource dependence theory is that company's success depends on its ability to obtain critical resources from other actors (Casciaro & Piskorski 2015, 167). These dependencies create power balances between parties. In principle, companies try to reduce others' power over them and increase their own power over others (Hillman et al. 2009, 1404). Moreover, RDT uses resource and information scarcity to gain understanding on the status of buyer and supplier power (Chicksand 2015, 123).

Essentially, resource dependence theory builds on various micro perspectives to build understanding on how companies develop strategies to engage and manage their environment (Hillman et al. 2009, 1418). The focus is on stabilizing the flow of critical resources and reducing uncertainty related to them (Wang et al. 2016, 5593). Furthermore, theory assumes that companies attempt to reduce the uncertainty and manage dependence by intentionally structuring the exchange relationships which creates connections with other companies (Paulraj & Chen 2007, 30). Therefore, resource dependence theory can be

applied also to explain how organizations reduce environmental uncertainty and interdependence. These actions can be taken after the influence of external factors on organizational behavior are recognized. (Hillman et al. 2009, 1404)

Thus, due to the need of external resources, there is naturally uncertainty attached to these resources. In order to reduce the uncertainty, companies can attempt to restructure the dependencies either unilaterally or by aiming directly at the other party. Unilateral strategies aim to solve the issue of limited source for example by reducing interest in certain resources. On the other hand, the dependent organization may aim to stabilize the flow of supply in interaction with the dominant party for example through exchange of information. (Casciaro & Piskorski 2015, 167-168). Additionally, in order to ensure the flow of critical resources, it has been proposed that interorganizational long-term collaborations are useful. Moreover, maintaining a long-term relationship has been argued to be recognized as a core argument of resource dependence theory. (Wang et al. 2016, 5588, 5593)

In buyer-supplier relationships, power positions and power balance should be especially recognized in relationship management and the development of relationships. Furthermore, for example Caniëls and Gelderman (2005, 141) argue that power positions should influence the choice of supply strategy. Stannack (1996, 47-48) argues that resource dependence theory doesn't completely explain power in purchasing and supply management. However, it provides a starting point for the understanding of power in this context. For example, Wang et al. (2016, 5593) agree that RDT provides a strong theoretical foundation for explaining interorganizational relationships.

2.2.2. Describing resources

As discussed, resources are a significant source of power and dependence. Additionally, resources are a core element of resource dependence theory. In order to understand what kind of resources companies are dependent on, it is necessary to further discuss what resources are. However, as in the case of sources of power and dependence, it is not possible to provide an inclusive list of potential resources (Galbreath 2005, 980). Grant (1991, 118) regards resources as inputs into the production process. Galbreath (2005, 980) defines resources as company-level factors that have potential to contribute economic benefit.

In essence, resources can be divided into tangible or intangible resources. Tangible resources refer to factors with financial or physical value that can be measured by the company's balance sheet, such as raw materials. On the other hand, intangible resources are non-physical and can rarely be found from balance sheet (Galbreath 2005, 980). Intangible resources can be divided further into assets, which are something that the company own such as patents, or into skills meaning competences which may be attached to the know-how of the employees or the collective abilities of the organization. (Hall 1992, 135-136)

There are also other ways to classify resources. Six major categories of resources have been identified by Grant (1991, 119). These are financial resources, physical resources, human resources, technological resources, reputation and organizational resources. Barney (1991, 101-102) classifies resources of the company into three categories of physical capital resources, human capital resources and organizational capital resources. Physical capital resources refer to the physical technology of the company, plant and equipment, geographical location and finally access to raw materials. Human capital resources consist of training, experience, judgment, intelligence, relationships as well as insights of the individuals of the company. Organizational capital resources include factors such as company's formal reporting structure, formal and informal planning, controlling, coordinating systems in addition to informal relations among groups within the company as well as relations in its environment. Naturally, not all these resources are necessarily critical to the company. Resources with higher degree of asset specificity, that are the resources that are more complex and customer-specific, tend to have stronger effect on company's dependence (Ramsay 1996, 130). Moreover, different resources are valid in different environments (Barney 1991, 103).

3. SUPPLIER CLASSIFICATION AND PORTFOLIO MODELS

This chapter addresses the themes of supplier classification and portfolio models. First, characteristics and importance of supplier relationship management will be discussed. This is followed with section of regarding supplier classification as a part of supplier relationship management (SRM) process. Finally, theory about portfolio models as supplier classification tools is presented.

3.1. Characteristics and importance of SRM

Next, it will be discussed what is supplier relationship management (SRM), and why it is important to companies. Based on the literature, SRM can be described as a complex and multidimensional entity. Therefore, it should be understood and implemented comprehensively. Once this is done successfully, SRM works as a systematic approach to collaboration enhancing the business performance of both parties. (Hughes & Wadd 2012, 22) A significant part of supply strategy focuses on suppliers and supplier relationships (Ahtonen 2009, 263). This highlights the strategic importance of SRM. Next, characteristics of SRM will be discussed further through defining the concept. After this, importance of SRM will be regarded.

3.1.1. Defining supplier relationship management

Moeller et al. (2006, 73) define SRM as a process of engaging in activities with suppliers to create and enhance value within relationships. Similarly, Lambert et al. (2012, 337) argue that SRM provides a structure how supplier relationships are developed and maintained. SRM consists of strategic and operational sub-processes, highlighting the fact that it is more than simple actions towards better relationships. Supplier relationship management includes thoroughly evaluating the relationship dynamics, dependency, risk and cultural fit (Day, Magnan, Webb & Hughes 2008, 45). Hughes (2008, 21) describes that as companies have various interactions over time, which aren't discrete and independent, it is important to manage those relationships. SRM has three main areas. First, it is assessing suppliers' assets and capabilities in a systematic and enterprise wide manner, however still respecting overall business strategy. Second, it is determining the activities to engage with different suppliers. Third, it is coordinated planning and executing the interactions in order to maximize the value.

Thus, SRM provides an opportunity to make best use of supply base in order to achieve competitive advantage (Schuh, Strohmer, Easton, Hales & Triplat 2014, 16). Park et al. (2009 496) state that the process is continuous, always seeking for further improvement. This continuous improvement forms a useful basis for creating a good relationship with the suppliers. Then again Cox (2004, 347) argues that there is no single right way to implement supplier relationship management actions, it always depends on the circumstances such as power relations. Therefore, supplier relation management won't be the same in every company, or even in the same company at different times.

3.1.2. Importance of supplier relationship management

Gadde and Snehota (2000, 306) argue that the most critical element of supply strategy is the company's ability to handle different types of supplier relationships. Moreover, it has been stated that in order to satisfy the specific product demands it is critical to fit together product categories and distinctive suppliers with the required capabilities and capacities (Nellore & Söderquist 2000, 245). It has been also stated that as many SRM processes are launched without clear direction, too many of them end up being a set of administrative activities such as meetings (Hughes 2008, 22). Therefore, SRM should be aligned with the company strategy and have targets based on it.

In principle, all buyer-supplier relationships should provide value, which is achieved through the different strategies (Meehan and Wright 2011, 33). Supplier relationships should be considered and treated similarly to other kind of investments as they represent some of the most important assets of the company (Gadde and Snehota 2000, 315). Then again, to be noticed is that SRM isn't just managing suppliers, it's more like jointly managing the interactions (Hughes and Wadd 2012, 24). At least two reasons have been identified to cause making good use of suppliers such a complex task. First, economic consequences are difficult to assess as due to the range of products and services supplied, the critical supplier relationships are complex. Second, buyer-supplier relationships are interactive. Companies can exercise only some control over the supplier while suppliers pursue their own business with buyers. Thus, the applied solutions are constantly changing. (Gadde and Snehota 2000, 306)

3.2. Supplier classification as a part of SRM process

There isn't one approach to supply chain management that is superior to others or appropriate in all circumstances (Cox 1996, 65; Cox 1999, 175). Moreover, Gadde and Snehota (2000, 305) argue that even if partnering has been proposed to be the superior strategy to make the most of supplier relationships, companies can be highly involved with only a limited number of suppliers and therefore need a variety of relationships. They state that these different kinds of relationships provide different benefits, whereas blindly partnering may be bad for practice. First, supplier relationship management process will be discussed in general in order to give context for supplier classification as a part of it.

3.2.1. Supplier relationship management process

There are many different descriptions and frameworks for supplier relationship management process in the existing literature. Park et al. (2009, 499-500) have presented an integrative framework, which provides a comprehensive overlook on the SRM process. The process is presented below in Figure 4. It begins with shaping the purchasing strategies through classification of items and analysis of supplier relationships and based on these action plans are developed. Next, suppliers are selected according to appropriate criteria. Then, there's supplier involvement, which represents the interaction with the supplier. After this, is time for supplier assessment and development. However, the process doesn't end here. Instead, stage of continuous improvement connects the process to the beginning.

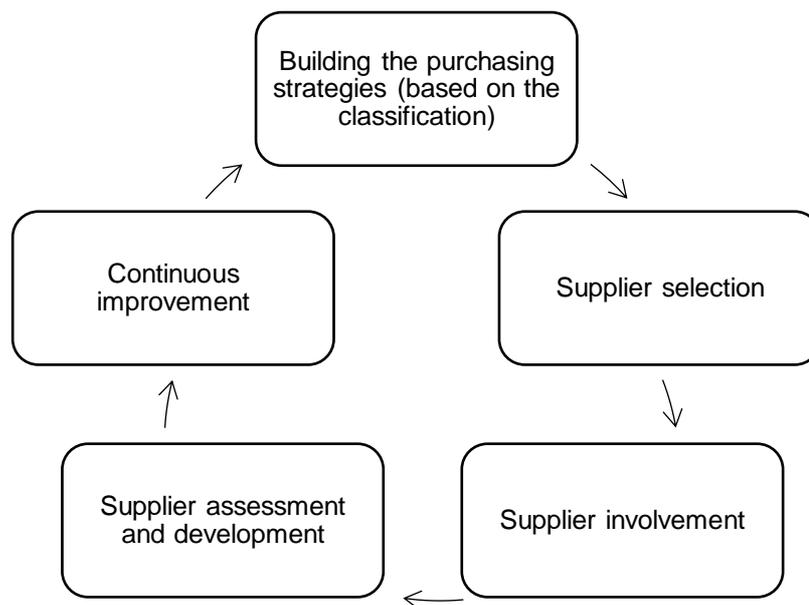


Figure 4. Supplier relationship management process (modified from Park et al. 2009, 499).

Purchasing strategies are usually based on different factors in different companies, while they are still generally emphasized based on the goals of the company (Svahn & Westerlund 2009, 178). Furthermore, organizations need to select appropriate strategies for each relationship while considering numerous factors such as power, risk, dependence and relational capacity (Meehan & Wright 2011, 33).

It has been stated that suppliers need to be classified in order to manage the relationships effectively and efficiently (Bensaou 1999, 37). Moreover, to achieve advantages of different relationships, suppliers should be strategically analyzed and segmented based on their characteristics (Dryer et al. 1998, 68). Naturally, buying organizations should put most focus on suppliers that have the greatest impact (Day et al. 2008, 41). Organizations need to select appropriate strategies for each relationship while considering numerous factors such as power, risk, dependence and relational capacity. In principle, all buyer-supplier relationships should provide value, which is achieved through the different strategies. (Meehan & Wright 2011, 33)

A part of strategic supplier relationship management is to identify criteria for categorizing suppliers. Identified criteria should be based on the specific needs and goals of the company. For example, criteria may include factors such as profitability, growth and stability, criticality, supplier's technology capability and compatibility, purchased volumes or supplier's culture of innovation. (Lambert et al. 2012, 342) More specifically, Enz and Lambert (2012, 505) argue that suppliers should be segmented based on financial information, for example profit impact. SRM activities should be focused only on the selected set of suppliers that have higher value of transactions, need for relationship management and potential to impact on the competitiveness and customer value creation (Schuh et al. 2014, 169).

Since suppliers are often categorized and differentiated in the literature regarding SRM, it seems to be a fundamental part of the process (see e.g. Lambert et al. 2012). However, (Nellore & Söderquist 2000, 263) have stated: "The classification is not an end in itself, but a means to aid in the development of appropriate action plans." Next, different classification practices will be presented.

3.2.2. Classification practices

Supplier classification refers to the part of the supplier relationship management process, where suppliers are grouped based on the selected factors. In principle, all buyer-supplier relationships should provide value, which is achieved through the different strategies (Meehan & Wright 2011, 33). Purchasing strategies are usually based on different factors in different companies, while they are still generally emphasized based on the goals of the company (Svahn & Westerlund 2009, 178).

As discussed, companies typically have a large number of suppliers, which generally need different treatment (Gelderman & van Weele 2005, 21). Consequently, Hallikas et al. (2005, 73) argue that in order to manage suppliers efficiently, distinct practices for different suppliers are required. In principle, classification can be based on the continuum approach or portfolio approach. In continuum approach purchasing literature divides buyer-seller relationships into arm's length adversarial relationships and collaborations such as partnerships (Meehan & Wright 2011, 33). On the other hand, portfolio approach focuses on management of wide array of supplier relationships with different characteristics and contributions as a set, instead of managing individual relationships (Wagner & Johnson 2004, 717). For some time, so-called Pareto analysis, also known as ABC analysis, was the main tool to distinct important and less important purchases. However, ABC analysis provides information only on the concentration of purchase spend as it focuses only on the financial value of items. Thus, it doesn't provide strategic recommendations for the categories. (Gelderman & van Weele 2005, 21)

3.3. Portfolio models as supplier classification tools

It has been recognized that supplier relationship management should include more than simply managing individual relationships. As a solution, portfolio approach focuses on management of wide array of supplier relationships with different characteristics and contributions as a set, instead of managing individual relationships. (Wagner & Johnson 2004, 717) According to Olsen and Ellram (1997, 103), portfolio models may be used to create a classification framework of the items, such as purchases or supplier relationships, that are included in the portfolio. However, it has been acknowledged that the actual use of portfolio models hasn't been yet studied thoroughly (Gelderman & van Weele 2002, 30).

Based on the classification, it is possible to identify which relationships require more attention than others. Moreover, by classifying the suppliers, companies are able to optimize the allocation of resources. (Olsen & Ellram 1997, 103). Due to the limited resources of companies, it is critical to allocate these resources appropriately to different relationships, in which portfolio models are useful for differentiating and prioritizing (Wagner & Johnson 2004, 718). Thus, using portfolio models may provide real value to the companies utilizing them. Portfolio analysis has been identified as an important tool particularly for discussing, visualizing and illustrating the possibilities of purchasing and supplier strategies (Gelderman & van Weele 2002, 36). Due to the contemporary nature of the business environment, suppliers' role in company's success has increased and therefore adapting a portfolio perspective in supplier relationship management is considered important (Wagner & Johnson 2004, 718).

3.3.1. Significant portfolio models

Purchasing models for situations, where the outsourcing decision has been already made, have been presented in previous research. For example, Nellore and Söderquist (2000, 246) point out the three models of Kraljic, Olsen and Ellram, and Bensaou. Next, these will be discussed further as these models present the fundamental basis for many purchasing portfolio models and therefore present the main characteristics of purchasing portfolios.

Kraljic's model was the first, comprehensive portfolio approach in the field of purchasing and supply management and is therefore considered as a major theoretical breakthrough (Gelderman & van Weele 2002, 30; Roseira, Brito & Henneberg 2010, 925). It is regarded as the dominant approach in the field of purchasing portfolios (Gelderman & van Weele 2002, 30; Gelderman & van Weele 2003, 207). The model has been widely used as a diagnostic and prescriptive tool since its inception (Montgomery, Ogden & Boehmke 2018, 192). Thus, Kraljic's purchasing portfolio (1983) is presented below in Figure 5. The model categorizes purchased items based on their profit impact and supply risk and as the result, items are classified into four categories of leverage items, strategic items, non-critical (bulk) items and finally bottleneck items. Profit impact can be seen to be influenced by factors such as volume purchased, the percentage of total purchase cost, impact on product quality or business growth. In terms of supply risk, factors such as availability, number of suppliers, competitive demand and substitutability are identified to potentially have an impact. Management suggestions are given to all categories, in which the principle is to minimize the supply risk and utilize the purchasing power. (Kraljic 1983, 111-114)

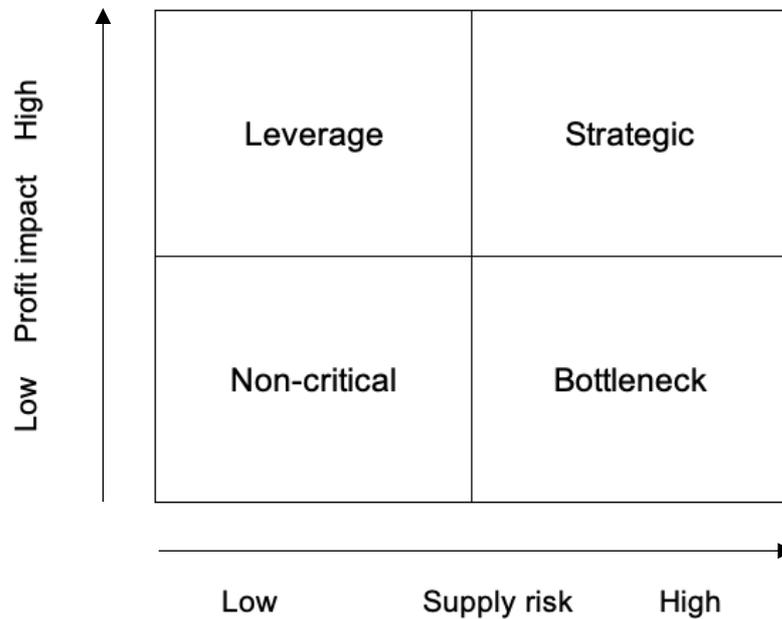


Figure 5. Kraljic's purchasing portfolio (1983, 111).

However, (Gelderman & van Weele 2002, 31) argue that in terms of the strategic recommendations given by Kraljic's model, they are quite generic in nature and provide only rough instructions for supplier strategies without really reacting and adapting to prevailing circumstances. Additionally, they state that the model takes current structure of power and dependence for granted despite the fact that companies could look for possibilities to move to strategically more attractive positions in the matrix. Consequently, Montgomery et al. (2018, 192) argue that one main weakness of Kraljic's portfolio model is the qualitative nature of it, resulting in a subjective model for weighting and positioning items in different quadrants, which is based on subjective judgement of the decision makers.

Users of Kraljic's model have to make many kinds of decisions regarding customization, when implementing the portfolio analysis, as Kraljic's approach is generic in its nature (Gelderman & van Weele 2003, 209-210). However, when elaborated and tailored, Kraljic's model provides sufficient guidance for companies to develop effective purchasing and supplier strategies (Gelderman & van Weele 2002, 30). In fact, based on Kraljic's model, also other researchers have presented their models to classify suppliers and supplier relationships (Caniëls & Gelderman 2005, 141).

Olsen and Ellram (1997) have presented a portfolio approach to supplier relationships, which introduces action plans after analyzing the purchase and the relationship with the customer. Their model begins with analysis of company's purchases based on the Kraljic's matrix, continued with the evaluation of the supplier relationships. This step includes classification of supplier relationships based on the relative supplier attractiveness and the strength of the relationship. Finally, based on the previous steps, action plans to manage the relationships are developed.

Bensaou's (1999) model begins with classification of supplier relationships into four categories based on high or low buyer specific investments and supplier specific investments. Next, contextual profiles are distinguished based on characteristics of product, market and supplier. As a result, there's are four different kinds of relationships of market exchange, captive buyer or supplier and strategic partnership. Finally, management profiles for each conceptual profile is designed.

Purchasing portfolio models of Bensaou, Olsen and Ellram, and Kraljic have been identified to have three steps in common. Models begin with the analysis of products and classification of these. Next, supplier relationships that are required to deliver these products are analyzed. Finally, in order to match the product requirements with the supplier relationships, action plans are presented. (Nellore & Söderquist 2000, 246) These steps indeed present the very essence of portfolio models and acknowledging them helps to apply them and customize for company-specific needs. For example, Gelderman and van Weele (2002, 30) have argued that when expanded and customized, Kraljic's model provides sufficient guidance for developing supplier strategies.

3.3.2. Application of portfolio models

Purchasing portfolio models have been recognized as valuable tools in developing differentiated purchasing and supplier strategies (Gelderman & van Weele 2005, 25). As procurement management has become increasingly strategic, also the application of portfolio models in the field has increased (Nellore & Söderquist 2000, 245). Yet, in terms of application of the portfolio analysis, a simple, standardized blueprint doesn't exist. Instead, the application requires reflecting on results, critical thinking and sophistication of purchasing management. (Gelderman & van Weele 2003, 207)

Portfolio models are regarded to provide useful inputs for supply management decision makers especially if utilized to indicate how different suppliers can be dealt with and what kind of action plans exist (Nellore & Söderquist 2000, 246). The strategic recommendations of purchasing portfolio should be elaborated and tailored to consider company-specific circumstances and conditions (Gelderman & van Weele 2002, 31). Portfolio models may contribute to competitive advantage for example by optimizing supplier base and developing suppliers (Wagner & Johnson 2004, 717). It has been identified that to improve buyer-supplier relations the connection between specification process and portfolio models is important (Nellore & Söderquist 2000, 245).

In terms of measurement, theory doesn't provide direct prescriptions or procedures (Gelderman & van Weele 2003, 208). Portfolio models vary with respect to the selected factors, factor weights and number of steps in analysis (Roseira et al. 2010, 926). No calculating rules exist to determine the distinction between "low" or "high" profit impact or supply risk (Gelderman & van Weele 2003, 208). However, Gelderman and van Weele (2002, 32-33) argue that measuring roughly is better than to not measure at all. Moreover, they discuss that when implementing the portfolio model, company management has to critically evaluate the supply markets, suppliers and purchase practices. Thus, by implementing the model, companies may become more aware of the strategic issues at hand. Yet, if the distinction fails, also the classification fails, resulting in false recommendations (Gelderman & van Weele 2003, 208). Fundamentally, any factor concerning the commitment of managerial time and resources in supplier management matters (Wagner & Johnson 2004, 719).

Additionally, some prerequisites have been identified for the application of a purchasing portfolio. Within the organizational hierarchy, purchasing needs to have a clear presence and position. Also, skills extending traditional administrative competences are required. (Gelderman & van Weele 2005, 25) Moreover, application of purchasing portfolio models has become one of the dominant purchasing strategies. Furthermore, most purchasing strategies are built on the Kraljic's model, making it the fundamental structure for these strategies. (Montgomery et al. 2018, 201)

Despite the wide acceptance and usage of purchasing portfolio models, there has been also some criticism against them. It has been argued that recommendations based on two basic dimensions are too simple for complex business decisions. (Gelderman & van Weele 2005, 19) In general, portfolio models have been criticized for providing limited explanations

regarding how categories should be actually managed after the classification. Additionally, portfolio models tend to result in independent or even contradictory strategies, even if in order to leverage the different situations, the strategies should be complementary instead. Another issue is that many suppliers won't exactly fit into the specific categories in matrix. Some suppliers such as systems suppliers might be integrating and supplying components from different categories. (Nellore & Söderquist 2000, 263-264)

Obviously, purchasing portfolio models have been criticized also in terms of measurement. There are doubts and questions at least regarding the selection of appropriate variables, measurement of these variables, operationalization of the dimensions, ignoring the supplier's side and simplicity of recommendations that are based on only two dimensions. (Gelderman & van Weele 2005, 21; Roseira et al. 2010, 926). Moreover, (Nellore & Söderquist 2000, 246) argue that criticism against portfolio models' general structure is especially due to the generality of the estimates regarding the parameters measured in each dimension.

If buyer doesn't take into account supplier's point of view, mismatches are likely to occur in the evaluation (Gelderman & van Weele 2003, 208). Moreover, Nellore and Söderquist (2000, 245) argue that since implications for suppliers are hardly considered, the application of portfolio model can potentially also pose a risk. Furthermore, portfolio models have been criticized due to the fact they ignore interdependencies in current dyadic buyer-supplier relationships (Roseira et al. 2010, 925).

Gelderman and van Weele (2005, 22, 25) have stated that while supporting arguments are based on qualitative case studies, counterarguments seem to derive from theoretical and conceptual studies. Moreover, there seems to be evidence that usage of portfolio model is associated with purchasing sophistication, that is more structured and professional purchasing. Thus, it can be concluded that despite the criticism presented towards portfolio models, when company-specific factors are considered, portfolio models provide useful insights for decision makers (Nellore & Söderquist 2000, 246).

3.3.3. Power and dependence in portfolio models

As said, power affects to what extent buyer can develop supplier to the direction it wants and needs and additionally understanding power helps purchasing organization to understand what kind of possibilities it has when working with the suppliers (Cox et al. 2003,

135). Portfolio model presented by Caniëls and Gelderman (2005, 141) is quite similar to the previously presented Kraljic's portfolio model. However, based on the research by Gelderman and van Weele (2003), it has been recognized that there's a distinction between strategies within the quadrants of the portfolio. Moreover, it is stated that power and dependence issues affect this choice of strategy (Caniëls & Gelderman 2005, 143). Therefore, model of Caniëls and Gelderman (2005, 143) include these different choices inside the portfolio quadrants and how some choices move position from one quadrant to another. This model is presented in Figure 6 below.

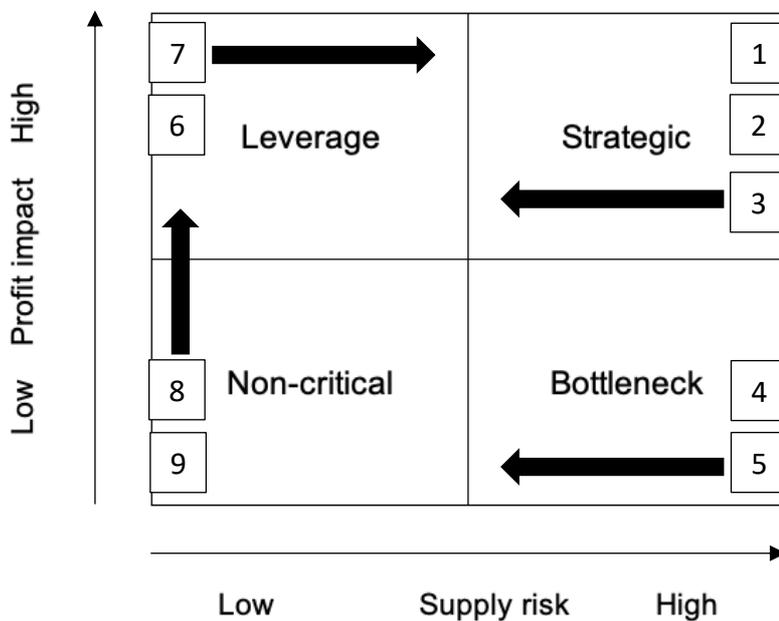


Figure 6. Overview of purchasing strategies based on the categorization (modified from Caniëls & Gelderman 2005, 143).

Numbers from 1 to 9 present the different strategies inside the quadrant. These, in addition to power relations characterizing each choice are summarized in Table 2 below. It can be seen from the table, that based on their study Caniëls and Gelderman (2005, 152) have found that different strategies are characterized with either power balance or supplier dominance. This is quite different from the distinction for example Cox (2004, 352) has made.

Table 2. Strategies based on classification and their power relation. (Caniëls & Gelderman 2005, 143-146, 152).

Number	Strategy	Power relation
1	Maintain strategic partnership	Power balance or Supplier dominance
2	Accept locked-in partnership	Supplier dominance
3	Terminate partnership, find new suppliers	Supplier dominance
4	Accept dependence, reduce negative consequences	Supplier dominance
5	Reduce dependence and risk, find other solutions	Supplier dominance
6	Exploit buying power	Buyer dominance or Power balance
7	Develop a strategic partnership	Power balance
8	Pool purchasing requirements	Power balance
9	Individual ordering, pursue efficient purchasing	Power balance

Next, these strategic choices are described more in detail. Strategic items are characterized with high impact on profit and high supply risk due to their considerable value to the organization (Caniëls & Gelderman 2005, 144). They are often close to buyer's core competence, require high level of customization and engineering expertise, or are in other way technically complex (Bensaou 1999, 38). Dryer et al. (1998, 70, 72) argue that strategic partnerships are required when supplier provides strategic inputs that typically have a major role in buyer's end product. These kinds of relationships seem to be preferred in complex-product industries. Yet, these relationships require higher degree of coordination between organizations. First strategy for strategic items is to maintain the partnership. Despite mutual trust and commitment, the situation has been identified to be characterized with supplier dominance. Second strategy is to accept a locked-in partnership. In this situation buyer is unable to pull out of the partnership due to unfavorable conditions. This could be for example due to some kind of monopoly power. Third strategy is to terminate the partnership and therefore reduce the dependence on supplier by searching for alternative suppliers. Usually this is required because of unacceptable or irreparable performance of

the supplier. (Caniëls & Gelderman 2005, 144, 152) Depending on organizations and its supply market's nature and size, the number of strategic suppliers had been identified to be typically between 5 and 50 (Day et al. 2008, 45).

Bottleneck items have lower influence on company's financial results, yet they are vulnerable in terms of their impact on supply which results in high supply risk. First strategy for bottleneck items is to accept the dependence and reduce the negative consequences. In this case, even with additional costs, supply needs to be assured. Supplier's dominance is undeniable in this case, which leaves buyer responsible for trying their best to eliminate the possibility of issues in supply, for example by keeping additional safety stock despite financial impacts of these. Another strategy for bottle neck items is naturally to reduce the dependence by finding other solutions. In other words, buyer needs to either find a new supplier or if this is not possible for example due to technical specifications, these specifications need to be redefined. This on the other hand, may be extremely difficult for purchasing organization and possibly requires cross-functional cooperation. (Caniëls & Gelderman 2005, 145) Dependence on suppliers can be reduced in various ways, such as by broadening specifications, making products less complex, supplier development and supply chain optimization (Gelderman & van Weele 2002, 36). Consequently, Olsen and Ellram (1997, 109) have argued that it may be more efficient to develop the existing relationship instead of establishing a new one.

Leverage items are high in profit impact as they represent major share of the end product, but due to generally good availability from various suppliers, the supply risk is low. These features often enable even more aggressive approaches to pursue cost savings. Thus, the first strategy is to exploit buying power. As long-term supply contracts aren't necessary due to the interchangeable nature of the products and suppliers, in this strategy buyer pursues competitive bidding to gain cost savings. This kind of exploitation of power would refer to buyer having the power in the situation. This was expected also by Caniëls and Gelderman, but according to their study the strategy was still characterized with power balance. (Caniëls & Gelderman 2005, 145, 152) Thus, it is no wonder that the second possible strategy is to develop a strategic partnership. However, this requires that supplier is not only willing but also actually able to contribute to the competitive advantage of the buyer. Therefore, the position is accessible mainly with suppliers who are technically advanced. Creation of mutual respect and establishment of a good, two-way relationship has been proposed for leverage items also by Olsen and Ellram (1997, 105). However, due to other factors in the

relationship, it's not always possible or desirable to practice heavy involvement with a supplier (Gadde and Snehota 2000, 315).

Final quadrant of non-critical items traditionally covers 80 percent of the buyer's transactions, even though they present less than 20 percent of the purchasing turnover, which follows the typical Pareto-principle. These items are typically characterized with low value, and easily available from multiple suppliers. First possible strategy for non-critical items is to pool purchasing requirements. In principle, purchases should be done as efficiently as possible while enhancing purchasing power through standardizing and bundling purchasing requirements. This would shift the purchase to quadrant of leverage items, which is the way to enhance the purchasing power. Another strategy is to remain in the quadrant and focus on individual ordering and efficiency. Usually this is advisable only when it isn't possible to pool the purchasing requirements and shift to leverage items. Indirect purchasing costs from administrative activities should be minimized by pursuing efficient working methods. (Caniëls & Gelderman 2005, 146)

4. RESEARCH DESIGN

In this chapter, the research design of this study will be explained. This includes presentation and justification of the selected methodology, in addition to describing data collection and analysis processes.

4.1. Methodology

In principle, research methods are either qualitative or quantitative. The nature of this study is qualitative, as qualitative research is often regarded as interpretative (Saunders, Lewis & Thornhill 2016, 168). In addition, the focus of the study is on addressing a non-numerical issue.

When conducting a qualitative research, case study is a research strategy which has been identified to be useful and valuable in the study of supply chain management (Kähkönen 2011, 31). Moreover, Voss, Tsikriktsis and Frohlich (2002, 195) describe case study to be one of the most powerful research methods in the field of operations management. In terms of assessing how case study would apply to this specific case and case company, case study has been recognized to be appropriate and essential research methodology where there is existing theory, but the environmental context is different (Stuart et al. 2002, 423). This statement clarifies that case study is appropriate research method to the case of this thesis. When the studied case can be described as a critical, extreme or unique case, a single case study is often used (Saunders et al. 2016, 186). Therefore, since the studied case can be described as a unique case, the type of case study should be a single case study. This is also supported by Voss et al. (2002, 203) as by using single case study, research manages to explore in greater depth. This promotes the study to achieve its objects. Moreover, as this study is conducted as an assignment to the case company, it is only natural to focus on the single case of the case company.

4.2. Data collection

In terms of acquiring empirical data, semi-structured interviews are typical in qualitative research and in case study (Saunders et al. 2016, 391). Likewise, Stuart et al. (2002, 427) argue that data in case study is often recorded and written interview, but also documents

provided by the company as well as researcher’s observations are used. Therefore, in order to acquire as diverse and thorough data as possible, empirical data of this study will be collected through semi-structured interviews, documents provided by the case company and observations of the author.

Semi-structured interview is a non-standardized type of interview. It consists of a list of themes and possibly some key questions, however the use of these may vary from interview to interview and the order of the questions possibly changes depending on the flow of the conversation. Also, additional questions may emerge as they are required. (Saunders et al. 2016, 391) It has been argued that interviews can collect much valuable data by going beyond formal interviews (Voss et al. 2002, 205). Based on these arguments, empirical data for this study is primarily collected through semi-structured interviews. Interviews were conducted online via Teams.

In Table 3 below, is the list of interviewees as well as their title and role in the procurement team of the business unit. Total number of interviewees was 5 persons, which included business unit’s Vice President of Procurement, two Senior Sourcing Managers and two Buyers. The number of interviews was limited due to quite small size of the purchasing department. However, despite the limited number of interviews, all suitable persons were interviewed.

Table 3. List of interviewees.

	Title	Role
Interviewee 1	VP Procurement	Responsible for the whole procurement department in the BU
Interviewee 2	Senior Sourcing Manager	Responsible for procurement in some projects
Interviewee 3	Senior Sourcing Manager	Responsible for procurement in one major project
Interviewee 4	Buyer	Daily, operative purchasing
Interviewee 5	Buyer	Daily, operative purchasing

Interview form was originally created in English but was translated into Finnish as also the interviews were held in Finnish. The original interview form can be seen in Appendix 1. Using the native language of the interviewees ensured smooth flow of conversation as the interview situation was as comfortable as possible, while possibility for misunderstandings was minimized. For example, Saunders et al. (2016, 403) have argued that interview questions should be formed in a way that interviewees understand them correctly. Interview themes of supplier relationship management, power and dependence perspective and supplier classification originated from theory. Likewise, questions were originated mostly from theory, but also from practical experience. Same interview form was used in all interviews in order to collect diverse data as interviewees in different positions provide different perceptions. All interviews were recorded for further analysis, also some notes were written during the interviews.

In terms of secondary data, case company provided existing documents such as guidelines and process descriptions to be used as secondary data. Additionally, data from case company's websites and intranet was utilized. As mentioned, in addition to interviews, data can be gathered by direct observation of for example meetings. Instead of formal process, this can be also casual observation. (Voss et al. 2002, 208) Thus, also casual observation was utilized during the thesis process not only in formal meetings but also in more informal situations. Some numerical data to support non-numerical data such as information regarding spend and OTD, was gathered through company's enterprise resource planning system.

4.3. Data analysis process

Structuring collected data in a variety of patterns has been identified as a useful technique to see order from chaos (Stuart et al. 2002, 427). For example, Seuring (2008, 131) has pointed out that transcription is an appropriate tool for analyzing the content of the data. Therefore, recorded interviews were transcribed for further analysis. However, transcribing is a very time-consuming process. A solution to this is data sampling, which means that only those sections of audio that are relevant for the research are transcribed. (Saunders et al. 2016, 579) Thus, after listening to the recordings of the interviews for a couple of times, relevant sections will be transcribed. This included most of the recordings, some parts that were not related to the study were excluded. Some of the more detailed examples were excluded also due to issues of corporate security. Therefore, none of the interviews

were transcribed exactly word-by-word. Then, these transcriptions were double-checked in order to ensure their quality. After this, transcriptions were read again carefully and main points were summarized. Data analysis process is presented in Figure 7 below.

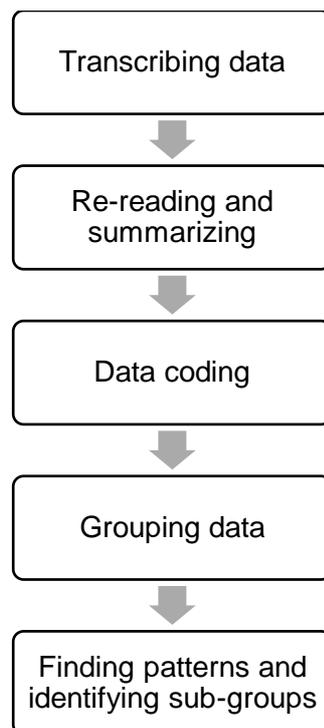


Figure 7. Data analysis process.

To find the themes or patterns that are related to the research question, it has been proposed that data coding should be applied (Saunders et al. 2016, 579). In practice, transcriptions were color-coded to find patterns in the set of interviews. Each theme of interview was given its own color and then the transcriptions were processed by highlighting findings with the color of the theme.

After having each interview color-coded, findings were grouped under the themes. If something was found in multiple interviews, these were grouped inside the group in order to later put more focus on these issues. After grouping the data from interviews, also findings acquired through secondary data were grouped under the themes. By grouping all collected data to one place, it is possible to analyze it comprehensively and thoroughly. Moreover, it allows to analyze the content of the data in a manner that patterns can be identified.

As a final step of data analysis process, patterns were identified from data. Moreover, patterns were recognized inside and across the theme-based groups of data. While finding patterns, the often-appeared factors were acknowledged and combined, resulting in identified sub-groups. Similarities and differences in interviews and observations were considered. Moreover, also data from existing documents as well as numerical data acquired from ERP was put into its context. Moreover, this data was mainly used as a background for analysis and to support findings from the interviews. As a result, there was a comprehensive view on the situation of the case company. The findings were then used to draw interpretations, which is presented next in the empirical part of the study.

5. EMPIRICAL STUDY – APPLICATION OF SUPPLIER CLASSIFICATION

In this chapter, empirical part of the study is presented. First, background of the case is discussed since it provides the basis for the empirical part and context for the findings. After this, the current state of supplier relationship management practice is further examined. Then, regarding power and dependence in supplier relationships, different sources of power and dependence identified in case company's relationships supplier relationships are presented. This is followed with analysis of purchases with aspects of profit impact and supply risk. Then, based on the analysis of purchases in addition to sources of power and dependence, development of portfolio model to classify suppliers in the case company is presented.

5.1. Background of the case

The case company of this study is an international company operating in the industry of defence, security and aviation. It is part of the public sector as it is mainly (50,1%) owned by the state of Finland. More precisely, the study focuses on one business unit, which is specialized in systems and devices that are offered to actors such as security authorities and defence forces of various countries. This includes for example intelligence and surveillance systems, their integration, software and life cycle support.

The industry of the case company can be described as sensitive, due to the nature of its business and actors in the field. Moreover, it is also quite complex as aviation side is characterized with strict policies in traceability of goods in addition to different kinds of approvals and certificates that are required from the suppliers. Many of the requirements towards suppliers are derived from the requirements of the customers, which often makes the whole purchasing process more complex. Additionally, availability of some items is limited so that there are only couple of actors that are able to supply them. Furthermore, some of the goods are under export control, which makes the purchasing even more complex.

During the past couple of years, the pace of the business has accelerated significantly. Internationalization, strategic development programs and established position as a strategic partner for one of the main customers has not only increased the number of suppliers and complexity of purchases, but also emphasized the importance of some suppliers. At the

same time, the general importance of supplier relationship management has been more widely recognized. Until recently, the investigated business unit has been almost exclusively in project business. In terms of supply management, this means that each project has been its own entity, which occurs only once. Thus, in every project, there has been individually selected set of suppliers and certain entity of purchased goods and services. However, now the business unit is in the middle of productization, meaning that there's a potential product to be produced in series. This has been identified to require change in the purchasing and supplier relationship management since the case company becomes increasingly dependent on a steady flow of supply.

To conclude, the role of supplier relationship management is currently changing in the organization, which has highlighted the need for more structured practice for supplier relationship management while taking into account the special characteristics of the examined business unit. Yet, due to the limited time and human resources, there hasn't been possibilities to develop such a practice. Purchasing department of the business unit consists of Vice President of Procurement, two Senior Sourcing Managers, two Buyers and one Trainee.

5.2. Analysis of current state of supplier relationship management

In the case company, supplier relationship management is recognized as a diverse entity, which includes numerous aspects. Moreover, as VP Procurement stated: "Supplier relationship management is one of the most important aspects of supply management". However, due to the lack of resources the development of practices has been bypassed and existing guidelines have been outdated, as the focus has been more on the daily business. Additionally, business units of the group differ from each other so that differentiated practices which take into account the specific characteristics of the business unit are required.

More structured practice for managing supplier relationships is required firstly to acquire information of the status of the suppliers. Systematically collected data regarding suppliers is valuable and helps to evaluate the performance of the suppliers and can be used as the basis for sourcing decisions in the future. Also, supplier relationship management practice is required for managing the pool of suppliers. Case company has thousands of suppliers, from which only few are identified as important. Because of the nature of project business,

it is acknowledged that “the number of suppliers is high, but suppliers come, and suppliers go” (Interviewee 1), making the management of supplier relationships challenging with most of the current tools. Additionally, in order to success in the productization process, it is critical to have practices to ensure steady flow of supply and find opportunities to develop the set of suppliers used in product.

There are number of elements that case company has identified as crucial to be included to the supplier relationship management practice. These prerequisites have been divided into critical factors that have to be taken into account in supplier classification and in development of the action plans for each group of suppliers. These are summarized in Table 4 below. Based on these company-specific elements, the supplier classification model with suggestions for future action plans will be proposed.

Table 4. Prerequisites of supplier classification and development of action plans in the case company.

Prerequisites for application of classification model in the case company	
Critical elements for classification	Critical elements for action plans
Project vs product	Focus on right suppliers
Approved suppliers, standards, certificates	Must be easy to apply and maintain
Technical specifications	Must take into account available resources

In terms of factors that are identified as critical elements for classification, one main issue is to recognize the difference between suppliers for projects and suppliers for products. The challenge is, that in some cases suppliers may provide inputs in both cases. Another issue to be considered is especially valid with airborne suppliers, as supplier approvals and certain standards and certificates are prerequisite for doing business. Finally, due to the nature of the many purchases, taking into account technical specifications is regarded as one of the most significant issues. Moreover, technical specifications could be described to be one of the main issues to differentiate purchases. It was discussed that “Currently the main focus has been limited to suppliers with major spend, while there are also other suppliers, that may not be as significant in terms of spend but are still similarly important for project or product due to the critical component they supply.” (Interviewee 2)

Regarding critical elements for action plans, case company has identified that the main issue is to be able to focus on the right suppliers, in other words the classification needs to give guidelines on how to act with each supplier. Moreover, it was argued that “Supplier classification should guide us to allocate resources better and to find which suppliers require more attention, as we can’t treat all equally.” (Interviewee 1) Finally, classification must be easy to apply, and action plans possible to maintain, most importantly action plans have to take into account the limited resources available. This means that while classification and action plans have to consider all the necessary suppliers, the proposed actions need to be feasible.

5.3. Power and dependence in supplier relationships

Power and dependence vary project-by-project, in some larger integration projects case company recognizes to have strong power over suppliers, while with some suppliers the case company is only a minor client to a larger multinational enterprise. Moreover, the power and dependence may be very different even at the same time in different cases. Naturally these cases do have an impact on each other, but this isn’t recognized that widely. Thus, it is hard to evaluate power and dependence existing in the supplier relationships of the case company. Next, some identified sources of power and dependence are gathered and discussed further.

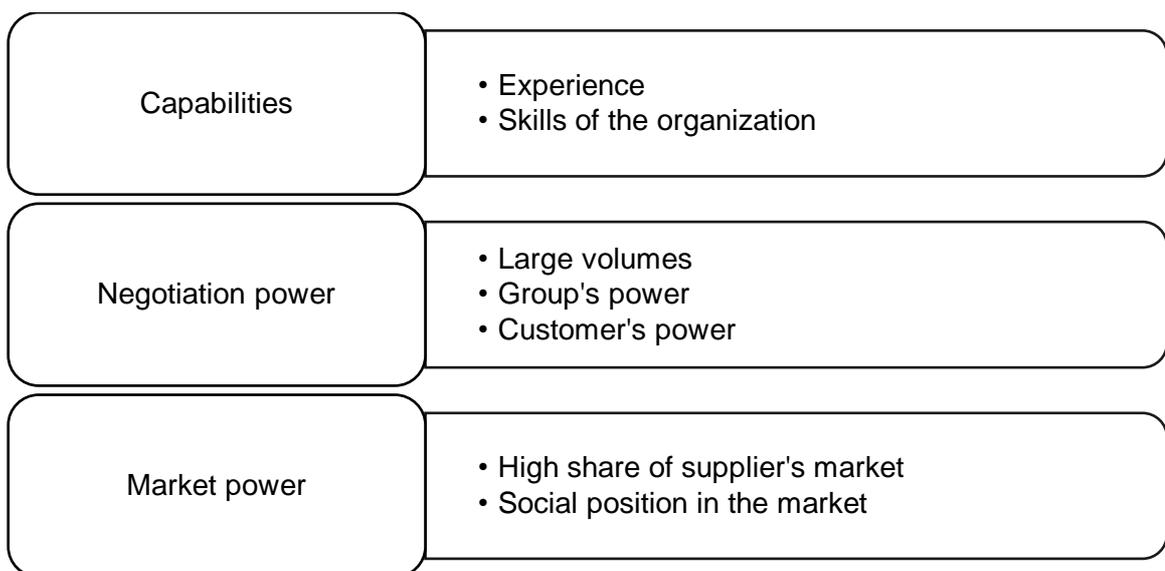


Figure 8. Case company's sources of power.

Identified sources of power of the case company are presented above in Figure 8. Sources of power have been divided into categories of capabilities, negotiation power and market power. Yet, some sources of power might apply to more than one category, but rough distinction has been made for clarity. First category of source of power is capabilities of the case company. There is a lot of experience in the purchasing department. Some of the team have worked in the company even for decades. They are well aware of the changes in the industry and know the main actors in the field. Moreover, they have experience from working with the suppliers and acknowledge the relationships with them. In addition, there are many fundamental skills for example in terms of contracting and to act with the suppliers and particularly to negotiate even in challenging situations.

Next category is negotiation power. It was recognized that “in certain projects, also the volumes are larger, which gives us moderate power”. (Interviewee 1) Moreover, this is seen to be connected to the size of the supplier compared to the case company: “Whether the supplier is small, medium sized or large compared to us, it affects the way how suppliers treat us and how attractive they see us as customers”. (Interviewee 1) However, power deriving from larger volumes is only contemporary, in other words bound to the specific one-time case. As transactions are not recurring, large volumes can’t be seen as a sustainable source of power. Realistically, in most relationships case company’s power over suppliers is minimal or non-existing. However, being part of larger group, suppliers quite often don’t separate the business unit from the group, which in some cases changes the power relations if supplier regards group’s volumes as one entity. Yet, sometimes it is more desirable to act separately from the group. This is not only due to larger volumes that exist in some cases, but as the integrator, case company is seen as a desired business partner. Also, sometimes especially in integrator projects, the power stems from the customer, as many suppliers have their own interest to work in projects with that customer.

Third category is market power. With some smaller suppliers, case company presents very high share of supplier’s market. In these cases, suppliers are dependent on the case company, increasing the power of the case company. Especially in major integration projects, this has been identified to be a significant source of power as “there are suppliers whose business is completely dependent on us”. (Interviewee 3) However, these situations are quite rare especially in terms of any critical purchases. Yet, it was seen important to avoid coercive strategies if it isn’t absolutely necessary. Finally, as case company is mainly owned by the state of Finland, it is domestically regarded as a very reliable customer. This gives the company sometimes leverage against suppliers. Additionally, the position in the

market and especially in the network as the strategic partner of a major actor is seen as a source of power: “we have these aspects of strategic partnership causing that we are regarded more important than we would individually be”. (Interviewee 1) Yet, with foreign suppliers the impact isn’t that remarkable. Moreover, in product business this is recognized problematic: “in terms of products, we are in a little more difficult position as all power is derived from our organization, which makes us relatively smaller compared to the situation with projects”. (Interviewee 1)

Next, sources of dependence of the case company are discussed further. These factors are divided into three categories of product characteristics, characteristics of purchasing and finally characteristics related to organizational factors. Again, the distinction is made to discuss the factors comprehensively. Identified sources of dependence are gathered in below.

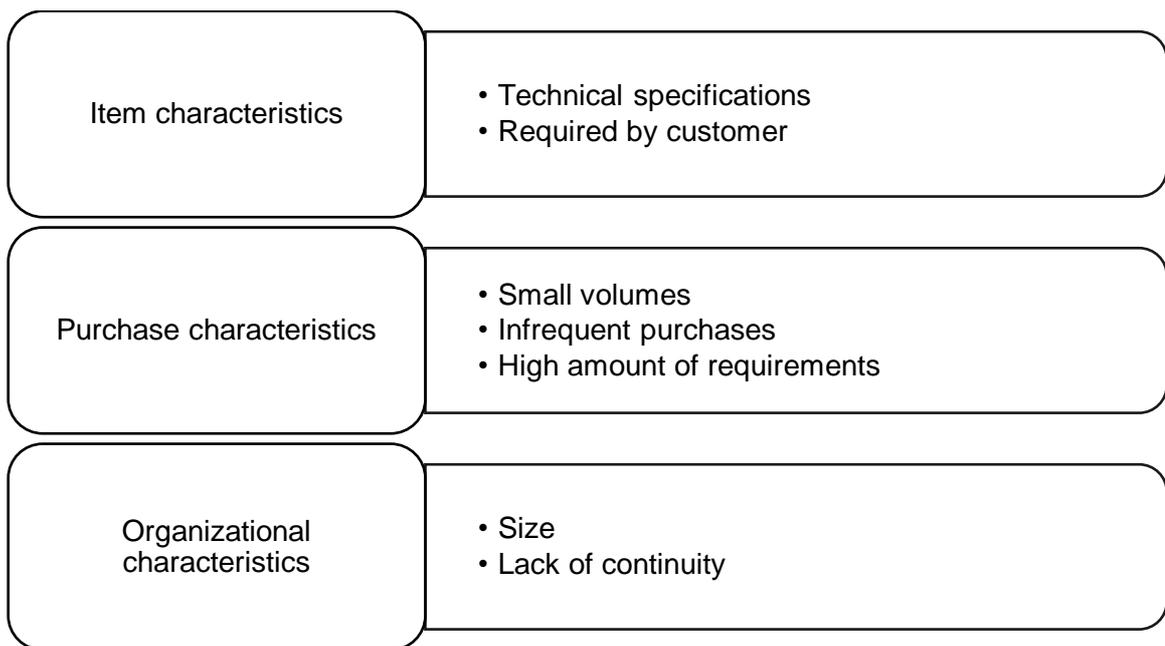


Figure 9. Case company's sources of dependence.

First category for sources of dependence is item characteristics, which refer to the characteristics of sourced products, services, software and other items. Main source for case company’s dependence are technical specifications. Most importantly, this is because of technical superiority of some required parts. For some items, there may be only one existing supplier in the whole world. In some cases, there may be alternative suppliers, but the switching costs are high either because the alternative is so expensive, finding

substitutes is so hard or because changing the part would require excessive changes in the whole assembly. Additionally, some products or software are required by customers. Naturally, these items can't be changed or replaced, making the case company dependent on these suppliers.

Another category for dependence is factors related to the characteristics of purchasing at the case company. In most cases, the volumes of the purchases are small. This reduces the purchasing power as in terms of standard components, case company rarely presents significant market share of the suppliers. Additionally, purchases are very infrequent as they "occur whenever they are needed" (Interviewee 2), which typically depends on the project. Moreover, this usually means that certain items are purchased only once as well as hinders the possibility of centralizing the purchases in order to increase volumes. It was argued that "the issue is that we cannot promise that there would be demand also in the future" (Interviewee 4). Regarding product purchases, currently volumes are relatively quite small, and purchases are infrequent, yet recurring. Still, the lack of mass production was regarded to cause great dependence: "As there is no mass production, also the volumes are low, causing that we have no leverage over suppliers" (Interviewee 5). Finally, case company usually has a significant number of different requirements for the purchases. There are strict policies in purchasing of airborne parts, which reduces the number of available suppliers even more: "due to required approvals and certifications, the number of suppliers we can do business with is significantly more limited than based on only technical specifications" (Interviewee 1). In addition, often lists of requirements are so extensive and this combined to the fact that the value of the purchase may still be low, drives suppliers to the situation that it isn't worthwhile for the suppliers to even quote.

Finally, there are couple of organizational characteristics increasing the dependency of case company. First, is the size of the case company. Compared to the large, multinational companies which are often used as suppliers for critical items, case company is relatively small. Thus, there is no leverage over this kind of suppliers, while case company may be highly dependent on their offering. Another issue is related to the nature of the business model more in general. In project business, there is lack of continuity which could make the suppliers more dependent on the case company. In current situation of mainly focusing on projects, suppliers are needed only for a moment, which increases the dependency in that specific moment. Yet, it was highlighted that "projects may be long, typically several years, and changing the supplier during the project may be very difficult" (Interviewee 3). Also, in terms of product purchases, the current uncertainty of upcoming values increases the

dependence of the case company since while they are still dependent on the items, the supplier may put more focus on their other customers with larger and more frequent volumes.

In terms of exercise of power, power is exercised if case company is in a dominant position, however, this seems to be a rare situation: “In most cases our power over suppliers is weak, if not completely non-existing.” (Interviewee 1) Furthermore, it was pointed out that differently to many industries “it is very typical, that the counterparty is our customer in one project, but supplier in the other” (Interviewee 3). This complicates also the exercise of power, as there are more aspects to consider. Also, suppliers are never exploited too harshly as it is not the basis for sustainable business. Moreover, it was stated that “for example in terms of prices, it is important to not exploit suppliers so that doing business with us would be harmful for them” (Interviewee 4). However, since quite often there is no power, which results in more humble approach. Additionally, it is acknowledged that all items don't provide basis for leveraging power: “In terms of suppliers for standard items, there isn't much to be developed or impacted, these suppliers tend to follow their own practices.” (Interviewee 2) Usually dependence is reduced only if there are issues with the supplier for example in terms of quality. It is acknowledged in the case company that in dependent position the strategy with suppliers has been more like putting out fires instead of proactive approach to develop the relationship. It was stated that “lower the power, less there are efforts on supplier relationship management” (Interviewee 1), as resources are limited, they have to be allocated where biggest value is available.

5.4. Analysis of the purchases

In this chapter, case company's purchases will be analyzed in order to be able to classify the supplier relationships. As the basis for analysis, dimensions of Kraljic's matrix will be applied. First, factors regarding profit impact are discussed. Then, factors regarding supply risk are addressed.

5.4.1. Profit impact

First, factors regarding supplier's profit impact are presented. As said, case company has very high number of suppliers. However, not all of these are active, and some suppliers are used very rarely or purchased volumes may be very small. Furthermore, sizes of single purchases vary from tens of euros to tens of thousands or even millions of euros. Thus,

spend per supplier is identified as a significant factor affecting the profit impact of suppliers. As can be seen from Figure 10 below, the spend is distributed in a way that only few suppliers cover most of the spend, and the rest are characterized with quite small spend. Out of these, obviously the most significant profit impact is on suppliers, whose spend covers for 80 percent of the spend. This limit has been marked to the figure. To be considered is that due to the massive number of suppliers with smaller spend, a rough limitation was already made in order to illustrate the distribution of suppliers. In reality, the tail is actually even longer. However, this doesn't significantly change the Pareto chart.

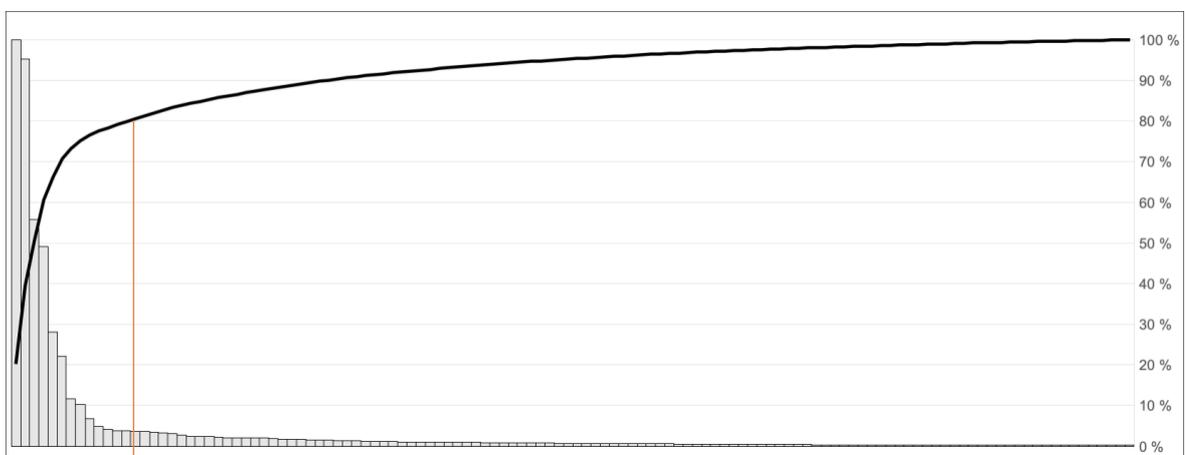


Figure 10. Distribution of spend.

Number of the purchased items per supplier wasn't regarded as an important factor. This is partly due to the nature of the purchases. In addition to components and software, also larger entities, including services are purchased. Therefore, since typically highest number of purchased items occur in the case of basic components, which can often be purchased from multiple places and which have relatively low value, the number of purchases doesn't provide useful information regarding the profit impact of the supplier. Furthermore, tracking of purchased items would be challenging since not all items have their own item number or other way to identify exact number of purchased items. Likewise, number of purchased rows doesn't provide valuable information since all required items aren't purchased at the same time, rather than during the process.

Purchases' or suppliers' impact on business growth wasn't identified as an indicator of profit impact. Suppliers are considered more as enablers since most of the designing takes place in-house. Thus, suppliers' role in the case company's business growth isn't something that radically has impact on profit. Additionally, the business model of the case company has

differed from typical in a sense that seeking of business growth hasn't been that focused on developing superior products that compete with others in the market, which would increase suppliers' impact on business growth.

Then again supplier's influence on product quality was considered as a potential factor affecting profit impact. However, as mostly case company's offerings are project-based with certain profit, the impact is regarded more in the long run than to the currently expected profits. Additionally, influence on product quality is recognized as a difficult factor to be measured based on available information. Moreover, since the company doesn't currently produce anything in series, the issue of inconsistent quality isn't recognized relevant. Instead, each product or project goes through quality assurance procedures. Thus, if there would be any issues with the quality of purchased items, they would be solved before impacting the result in the end and therefore wouldn't have such an impact on the result.

5.4.2. Supply risk

Next, factors regarding supply risks related to suppliers are discussed. First identified factor is technical specificity of the sourced item. In the case company, this includes aspects whether the item is technically specific so that it is non-substitutable due to limited number of available suppliers, meaning that the situation is described as technical single source, but also if the item is non-replaceable in terms of project or product. In other words there would be substitutes in the market but the customer or product configuration requires certain items to be used. Moreover, in many cases purchased items are so technically advanced, that they are available only from one place, causing that if there is an issue in one delivery, the whole business is damaged. This has been acknowledged in the case company: "In one project, there was conducted a research on whether there are other suppliers for a certain kind component. Some were found, but due to issues of capacity and technical aspects, other options weren't actually feasible." (Interviewee 1)

Another factor of supply risk is availability. Some items are better available than others, regardless of their technical specificity. Furthermore, even some of the technically specific products may be well available, depending on their lead time. On the other hand, some items may be limitedly available, for example due to export control regulations. Additionally, some items are commercial off-the-shelf products, while others are custom made for the case company, which means that the number of available suppliers to produce and deliver required items may be limited. Moreover, it was stated that "Since many of our items are

quite special and specific, the availability of a critical item could potentially endanger the whole assembly.” (Interviewee 2)

In terms of geographical and cultural distance, the main risk is identified to be in the interaction with the suppliers. Due to geographical distance, it is harder to meet face-to-face and execute audits, but more importantly, cultural differences may affect the business practices and for example negotiation processes. Whereas geographical distance is quite rarely an issue since existing technologies enable online meetings, the possibility of cultural conflicts poses a risk to the flow of supply. Delays may be caused due to extensive paperwork required, or open and straightforward communication may be difficult. Geographical distance does however effect on deliveries as from some areas delivery times are more uncertain than from others, making some suppliers riskier in that sense.

Finally, delayed deliveries are recognized as a major risk to the business. If critical deliveries are late, this could delay the whole project, which potentially results in major financial consequences. Also, in terms of products, if items arrive significantly later than what has been confirmed to purchasing, assembly is delayed and in worst case delivery to customer would be also late. This is never desirable, but especially as products are still introduced to the market, late deliveries could have significant consequences for the future demand of them. Currently, deliveries have been examined through on time delivery -rates (OTD). This enables the case company to view data regarding which suppliers are struggling to deliver as confirmed.

5.5. Development of supplier classification model

Development of a model for supplier classification begins with assessment of suppliers' through evaluation of purchases. This includes setting evaluation metrics first in terms of purchases' profit impact and then through their supply risk. After that, power and dependence in the buyer-supplier relationships are evaluated based on the power relation, meaning that first case company's power as a buyer is evaluated and then supplier's power is evaluated. This is conducted by assessing buyer's sources of power and then sources of their dependence, as it substitutes sources of supplier's power. The difference between power and dependence indicates the power relation of the relationship, which provides information regarding the circumstances of the relationships case company has. Finally, these two

evaluations are combined as one comprehensive model for classification of supplier relationships by applying a portfolio model presented by Caniëls and Gelderman (2005).

In terms of profit impact, the factor applied for classification is spend. As the basis for this, group’s guidelines for classification of suppliers in the evaluation of new suppliers was utilized. However, the guideline was expanded for the needs of the examined case business unit. Traditional Pareto-analysis was applied to distinct the smaller number of suppliers that cover most of the spend. Spend data from previous year, in this case year of 2019, was used for this. Data is conveniently available from company’s ERP and is also easily comparable between different suppliers, but also in terms of different years. For classification, certain volumes were given values from 1 to 5, latter presenting volume of 80 to 100 percent of company’s total spend. These suppliers present the most significant impact for profit of the case company. Other volume limits were based on the group’s guideline. In Table 5 below, these volumes are described verbally, as exact amounts aren’t public information.

Table 5. Evaluation of profit impact.

Value	1	2	3	4	5
Spend	“low”	“quite low”	“medium”	“significant”	“major”

Next, factors for evaluation of supply risk will be presented. These are gathered in Table 6 with the proposed scale of evaluation, in which the factors are again given values from 1 to 5. Therefore, in order to obtain a value presenting supply risk, a mean must be calculated based on values given to factors. The first factor of supply risk is technical specificity, which is assessed on scale of low to high. Low technical specificity would refer to standard commercial off-the-shelf items, whereas high technical specificity requires superior skills, knowledge or technology from the supplier. Another factor for supply risk is the aspect whether item is required for product or project. This is evaluated as yes or no, as if it is required, it is fundamentally critical due to the fact that if it couldn’t be purchased, it would endanger the quality and even the whole delivery of the product or project. These two factors of technical specificity and required for product or project cover the aspect of substitutability, meaning that based on these factors it can be assessed whether the item is substitutable so that also the supplier could be replaced.

Then, availability is assessed from good to poor. This factor is reverse compared to others, as better the availability, lower the supply risk. As discussed, availability is determined based on the number of available sources of supply. This includes number of suppliers that are able to offer the item but is limited also by the number of suppliers that are possible for example in terms of different approvals and certifications, in addition to suppliers that are possible in terms of export control regulations. Additionally, some items are characterized with longer lead times, which should be acknowledged when assessing the availability of an item.

Next factor is geographical and cultural distance, which is assessed on scale of minor, medium and high. In the assessment Finnish suppliers are characterized with minor risk, suppliers from Europe with medium risk and outside Europe are high risk. Finnish suppliers are both geographically and culturally closest to the case company and in this sense present practically no risk. Suppliers from elsewhere in Europe are still quite close, but some differences especially culturally can be identified to have an impact. Then again suppliers from outside Europe are geographically furthest, but also cultural factors differ more significantly, which is seen to potentially pose a risk for the steady flow of supply.

Final factor of supply risk is OTD-rate, which is calculated based on the number of order rows that have been delivered on time compared to total number of rows ordered supplier. This is more specific than assessing the order as a whole, since quite often something is on backorder, which would make the whole order late. Low risk is attached to OTD-rate over 80%, which would mean that most of the deliveries have been on time. Highest supply risk would mean that less than half deliveries have been on time, which is remarkably poor result and should be considered with appropriate practice.

Table 6. Evaluation of supply risk.

Value	1	2	3	4	5
Technical specificity	Low	Quite low	Medium	Quite high	High
Required for product/ project	No	-	-	-	Yes
Availability	Good	Quite good	Moderate	Quite poor	Poor
Distance (geographical, cultural)	Minor (Finnish supplier)	-	Medium (Europe)		High (outside Europe)
OTD-rate	>80%	>70%	>60%	>50%	<50%

After completing the evaluation of purchases based on profit impact and supply risk, it is necessary to analyze the power relation within each supplier relationship. As power relation is based on the differences in one's power over another, it is necessary to first evaluate buyer's sources of power and then buyer's sources of dependence. Factors of buyer's dependence are roughly identical to supplier's sources of power, but possible to evaluate in the position of the buyer, since this kind of information wasn't available from suppliers' side. The evaluation is conducted similarly as previous assessment of purchases, factors are given values from 1 to 5, 1 indicating that power or dependence is low while 5 indicates that power or dependence is high. Then, values of both aspects are summarized, followed with comparison of the sums. As the result it can be seen if the relationship is characterized with buyer dominance which in this case means power, if there is power balance where both parties are equally dependent on each other or if there is supplier's power, meaning dependence for case company. Next, these factors are discussed more in detail. First, evaluation from for sources of power is presented in Table 7.

Table 7. Evaluation of sources of power.

Source of power	Value 1-5
Large volumes	
Large share of supplier's market	
Asymmetrical information	
Position in the supply chain	
<i>Power</i>	<i>Sum</i>

In terms of sources of power, first factor to be assessed is whether the purchased volumes are large. Especially in major integration projects, this has been identified to be a significant source of power. Then, it is assessed whether the case company holds a large share of the market for supplier. In some cases, the case company may be the main customer of a smaller supplier, increasing the case company's power in the relationship. On the other hand, if the supplier is a large, multi-national company, it is unlikely that case company would have a major share of their sales. Additionally, asymmetrical information represents a source of power for case company. As mentioned, there is a lot of experience and knowledge in the purchasing department regarding the market in addition to different actors in the field. Furthermore, if the supplier isn't that aware of the circumstances of case company's industry, asymmetrical information for case company's benefit can be identified. Finally, power is assessed through the position of the case company in the supply chain, moreover case company's position either as part of the larger group, or the position in the supply chain for example as a supplier to certain customers.

Table 8. Evaluation of sources of dependence.

Source of dependence	Value 1-5
Small volumes	
Small share of supplier's market	
Non-substitutability of the supplier	
Size of the supplier	
<i>Dependence</i>	<i>Sum</i>

Then, sources of dependence in the case company are assessed as presented in Table 8. First factors are opposite from sources of power. Small volumes are a significant source of dependence, as in many cases suppliers aren't that interested in buyers with small, infrequent purchases. Moreover, if the case company represents only small share of supplier's market share, supplier is likely to focus on buyers with bigger share. These factors may not seem to directly increase buyer's dependence, but as they are clear sources of supplier's power, they should be considered in the evaluation. Another factor increasing case company's dependence is the non-substitutability of the supplier. This may be due to the technical specificity, customer requirement or simply the availability of the item. If the item is non-substitutable, the case company practically has no choice but comply with the terms given. Last factor is the size of the supplier, as if supplier is a large, multinational company, they would have power over the case company.

After each factor representing source of power and dependence are given values from 1 to 5, there are two sums which indicate the amount of power and dependence. By comparing these sums, the power relation of the relationship can be defined. If value of relative power is greater than the value of relative dependence, the case company is in the dominant position. Consequently, if relative dependence is greater than relative power, the case company is in dependent position. Then, if relative power and relative dependence are equal, there is interdependence between parties. These different power positions determine how different supplier relationships should or could be managed.

Next, the assessments of purchases through profit impact and supply risk are combined with the assessment of power and dependence. This is illustrated in Figure 11 with an illustrative example. Items are first placed in the matrix to different quadrants based on their values of profit impact and supply risk as in Kraljic's matrix, but since factors were given values on scale 1 to 5, mean value of supply risk factor is used. For example, if the item was evaluated to have profit impact of 4 and supply risk of 2,75 it is located in the quadrant of leverage items, which has been indicated with an orange spot in the matrix. Next, the power position of the relationship is evaluated through sources of power and dependence as discussed. For example, if the value for power is given total value of 15 and total value for dependence is 5, the case company is the dominant party in the relationship. This means that the case company would be able to exercise power in the relationship and for example exploit buying power to achieve lower prices or better terms of payment. Moreover, based on the circumstances of relative power, it is indicated whether it is possible to exercise

power so that item could be moved from one quadrant to another. This has been presented in Figure 11 with arrows.

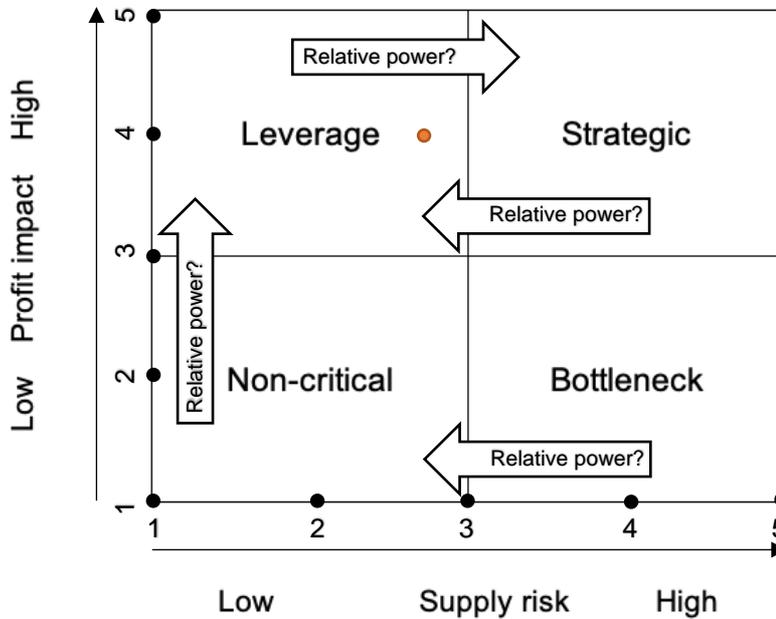


Figure 11. Illustrative example of the application of the proposed portfolio model.

Thus, with this portfolio model, suppliers are classified based on the characteristics of the purchase, while taking into consideration the power relation within the relationship, which affects the way these relationships actually should be managed and what is possible given the circumstances. Based on the classification of items and evaluation of relationships, suggestions for management practice for each group of suppliers may be provided. These suggestions of action plans take into account the power relation in the relationship as well as what type of purchases are in question. In terms of strategic items, it is possible to establish, maintain or terminate a strategic partnership with a supplier. Terminating the partnership would shift the item to category of leverage items. Since bottleneck items are typically characterized with high dominance, options are to either accept or reduce the dependence. By reducing the dependence, also the supply risk is reduced, which makes the item a non-critical item. On the other hand, leverage items generally present power dominance, providing possibilities to exploit buying power or to develop partnership and shift to category of strategic items. Finally, in terms of non-critical items, it is possible to either remain in the quadrant and practice efficient purchasing or pool purchasing items and shift to group of leverage items.

6. DISCUSSION AND CONCLUSIONS

In this final chapter of the study, research will be discussed and concluded. First, presented theory is reflected into the empirical findings of the study. Then, research questions and their answers will be discussed in addition to considering managerial implications of the findings. After this, reliability and validity of the study will be evaluated. This is followed by explaining the limitations of the study in addition to proposing matters of future research. Finally, the conclusions of the study are presented.

6.1. Reflecting theory into empirical findings

When reflecting theory into empirical findings of the study, both similarities and differences were found. Based on previous scholars, the importance of supplier relationships has increased, making also the theme of power interesting in the literature of supply management (Emerson 1962, 32; Gelderman & van Weele 2004; Cuevas et al. 2015, 149). Similarly, it had been recognized in the case company that the importance of supplier relationship management has significantly increased. Yet, power and dependence perspectives hadn't been acknowledged in the daily business or formation of purchasing strategies. However, literature identifies power as a critical concept to affect the way buyers and suppliers interact with each other but also to determine the situations when the buyer is able to develop the type of interaction (Cox, 2003, 135). Therefore, in order to evaluate the circumstances of the supplier relationships, power and dependence of these relationships were assessed.

Power relation was defined as the relation between two actors based on their power sources, therefore it can be regarded as a power balance between power position of buyer compared to the power position of the supplier (Kähkönen 2014, 20). Then again sources of power are the factors which enable companies to acquire and possess power (Cendon & Jarvenpaa 2001, 125). Moreover, it has been argued that one's dependence provides the basis for the power of the other (Emerson 1962, 32), therefore as suppliers' sources of power couldn't be assessed based on information provided by them, suppliers' power was defined based on case company's sources of dependence. Number of different sources of power and dependence were identified in the literature, including factors such as resources, substitutability of the source, organizational position, differentiation of suppliers, position in the supply chain, number of actors, portion of market share, number of alternatives

(Buchanan 1992, 65; Cendon & Jarvenpaa 2001, 123; Chambolle & Villas-Boas 2015, 63; Cox 1999, 171; Cox 2001b, 14). In terms of the case company, evaluation regarding sources of power was developed to be based on factors of volumes, share of supplier's market, asymmetrical information and position in the supply chain. These factors were mainly similar to factors identified in literature. However, whereas position in the supply chain was identified as a source of power in the literature, this study pointed out that more specifically power may also derive from the relationships and partnerships the company has.

Then, in terms of suppliers' potential sources of power as the case company's sources of dependence, factors regarding item characteristics and especially the non-substitutability of the supplier were identified major. Non-substitutability includes technical specifications, availability and whether the item is required by customer. This is consistent with resource dependence theory, which assumes that only a few organizations are self-sufficient in terms of strategic and critical resources, which leads to dependence on other organizations (Paulraj & Chen 2007, 30). Concerning these kinds of items, it is critical to ensure the steady flow of supply, which in terms of resource dependence theory would mean to reduce the dependence on these suppliers. Other sources of dependence include factors such as purchase characteristics in terms of small volumes, small share of supplier's market and size of the supplier.

With respect to supplier relationship management, Lambert et al. (2012, 337) have argued that SRM provides a structure how supplier relationships are developed and maintained. In principle, all buyer-supplier relationships should provide value, which is achieved through the differentiated strategies (Meehan & Wright 2011, 33), since there isn't one approach to supply chain management that is superior to others or appropriate in all circumstances (Cox 1996, 65; Cox 1999, 175). This had been acknowledged also in the case company, resulting in a need for more structured practice of supplier relationship management. Moreover, to achieve advantages of different relationships, suppliers should be strategically analyzed and segmented based on their characteristics (Dryer et al. 1998, 68). In order to conduct the classification, portfolio models may be used to create a classification framework of the items, such as purchases or supplier relationships (Olsen & Ellram 1997, 103; Wagner & Johnson 2004, 717). Yet, based on the literature the actual use of portfolio models hasn't been yet studied thoroughly (Gelderman & van Weele 2002, 30). Therefore, portfolio model was applied to classify suppliers and the study provided an example from one case company, how it can be actually used.

A part of strategic supplier relationship management is to identify criteria for categorizing suppliers. Identified criteria should be based on the specific needs and goals of the company. For example, criteria may include factors such as profitability, growth and stability, criticality, supplier's technology capability and compatibility, purchased volumes or supplier's culture of innovation. (Lambert et al. 2012, 342) Dimensions of the applied portfolio model were profit impact and supply risk, therefore factors that describe these aspects at the case company were identified. Profit impact was regarded to be determined based on spend per supplier, whereas evaluation of supply risk was based on factors of technical specificity, whether the item is required for product or project, availability, geographical and cultural distance and OTD-rate. These were mainly similar to factors Kraljic (1983, 111-114) has defined. However, the factor whether item is required product or project is quite specific aspect of substitutability, which doesn't occur in many industries. Especially this factor describes the nature of the business at the case company.

Yet, in terms of application of the portfolio analysis, a simple, standardized blueprint doesn't exist in the literature. Also, in terms of measurement, theory doesn't provide direct prescriptions or procedures. (Gelderman & van Weele 2003, 207-208) In order to combine power and dependence to the classification of suppliers, model of Caniëls and Gelderman (2005, 143) was presented and applied. First, presented factors determining profit impact and supply risk were given values from 1 to 5 in order to place them in the classification matrix. Then, presented factors determining sources of power and dependence were also given values from 1 to 5 to determine the power relation in the relationship. Traditional portfolio models have been identified to have three steps in common. Models begin with the analysis of products and classification of these. Next, supplier relationships that are required to deliver these products are analyzed. Finally, in order to match the product requirements with the supplier relationships, action plans are presented. (Nellore & Söderquist 2000, 246). The applied portfolio model proceeded consequently, as analysis of supplier relationships was conducted through assessment of power and dependence in these relationships.

Moreover, power relation determines the kind of structural conditions under which the company will be able to reconstruct the dependencies (Casciaro & Piskorski 2015, 179). In other words, based on the applied portfolio model, the case company may manage the supplier relationships in an optimized manner and identify when it's possible or advisable to reduce dependencies. Moreover, as a fundamental principle of resource dependence theory is that companies try to reduce others' power over them and increase their own

power over others (Hillman et al. 2009, 1404), action plans also identify strategies to increase the power over suppliers.

There has been also some criticism against portfolio models. For example, it has been argued that recommendations based on two basic dimensions are too simple for complex business decisions. (Gelderman & van Weele 2005, 19) Moreover, (Nellore & Söderquist 2000, 246) argue that criticism against portfolio models' general structure is especially due to the generality of the estimates regarding the parameters measured in each dimension. However, by applying the company-specific factors on the dimensions and by specifying the distinction from low versus high to scale from 1 to 5, classification is more structured and specific, providing also more sophisticated recommendations.

6.2. Discussion of the research questions and managerial implications

The main research question of the study was "*How suppliers can be classified and managed by using portfolio model, while taking into account the existing power relations and dependency on suppliers?*". In order to answer the main research question, three sub-questions developed to support it will be discussed. First sub-question was "*What kind of factors can be used to classify suppliers in the portfolio?*". Based on the literature, it was identified that classification factors should derive from the specific needs and goals of the company (Lambert et al. 2012, 342). Portfolio models indeed vary with respect to the selected factors (Roseira et al. 2010, 926). As the basis for portfolio model was the one presented by Caniëls and Gelderman (2005, 143), the dimensions in the portfolio were profit impact and purchase risk. Yet, no calculating rules exist to determine the distinction between "low" or "high" profit impact or supply risk (Gelderman & van Weele 2003, 208). Since it had been argued that measuring roughly is better than to not measure at all (Gelderman & van Weele 2002, 32-33), based on the analysis of the purchases at the case company, factors contributing to profit impact and supply risk were identified and given scales from 1 to 5 in order to obtain a numerical value for both aspects. In terms of profit impact, the spend per supplier was recognized as the only valid factor. Regarding supply risk, five factors of technical specificity, whether the item is required for product or project, availability, geographical and cultural distance in addition to OTD-rate were selected. Based on these company-specific factors, it is possible to position suppliers to different quadrants in the portfolio.

Second sub-question was *“How to apply aspects of power and dependence to supplier management practice?”*. Concepts of power and dependence are widely recognized to be important for understanding buyer-supplier relationships (Caniëls & Gelderman 2007, 219). More specifically, companies need to first understand the power and leverage circumstances in order to understand how to manage the relationships they have (Cox 2004, 346). Moreover, it has been stated that power and dependence issues affect the choice of strategy selected with each supplier (Caniëls & Gelderman 2005, 143). By assessing sources of power and dependence in the supplier relationships, it is possible to define the power relation in each relationship. This is conducted by giving values from 1 to 5 to different sources of power and dependence and then comparing the sums of the values, indicating whether power or dependence is greater. Based on this it can be defined whether power relation is characterized as buyer dominant in case power, supplier dominant in case of dependence or if parties are mutually dependent. Then, aspects of power and dependence are applied to supplier management practice as based on the evaluation of the circumstance of the relationship, action plans can be provided.

Third sub-question was *“How portfolio model can be used as a basis for managing supplier relationships?”*. Purchasing portfolio models have been recognized as valuable tools in developing differentiated purchasing and supplier strategies (Gelderman & van Weele 2005, 25) Portfolio models are regarded to provide useful inputs for supply management decision makers especially if utilized to indicate how different suppliers can be dealt with and what kind of action plans exist (Nellore & Söderquist 2000, 246). It was described in the study that by applying portfolio model, it is possible to classify suppliers based on company-specific factors as discussed and after evaluating the relationships, it is also possible to derive feasible action plans for managing the suppliers. Thus, it was found that while application of portfolio model for the basis of managing supplier relationships and moreover to develop appropriate management practice for them requires thorough analysis, it is highly useful and adaptable tool for supplier relationship management. Moreover, portfolio models provide valuable insights on the current and possible stages of the relationship in addition to a good basis for managing the supplier relationships rather than being an actual management practice.

To conclude, suppliers can be classified and managed by using portfolio model, while taking into account the existing power relations and dependency on suppliers as follows. First, suppliers must be classified into different quadrants based on company-specific factors. Then, the supplier relationships must be assessed regarding the power and dependence

within those relationships. Finally, by combining these two stages, it is possible to establish strategies for management of each supplier relationship, which takes into account not only the characteristics of purchased items but also the existing power relations and dependence on suppliers.

This study provides multiple managerial implications. For the case company, this study provides insights on their supplier relationship management as well as proposes a more structured practice to manage these relationships, while considering the underlying circumstances in terms of power and dependence. Moreover, the main managerial implication is the provided supplier classification portfolio. By applying the portfolio model, suppliers can be classified comprehensively and based on factors that are relevant for the case company. Furthermore, after combining evaluation of power relations to the classification, it is possible to provide suggestions to enhance the supplier management process with feasible action plans. Next, these suggested action plans are discussed accordingly with the four portfolio quadrants.

In terms of strategic items, according to Caniëls and Gelderman (2005, 144) there are three possible strategies. First is to maintain strategic partnership. This is advisable in the situation of power balance, as then no party is dominant to each other, however it is possible also, if other party is dominant, but there is trust and both parties are committed to the partnership. Then again, if supplier is clearly dominant, it is possible to either accept the locked-in partnership or terminate the partnership and find new suppliers. This, however, depends strongly on whether the supplier is substitutable or not. Additionally, before terminating the relationship, it is necessary to consider the situation as a whole. Being dependent on a supplier isn't necessary such an undesirable situation, that there is need to terminate the partnership. Moreover, dependency in a relationship is only natural as companies are by nature dependent on their environment for the supply of needed resources (Gelderman & van Weele 2004).

For bottleneck items, it is possible to either accept the dependence or to reduce the dependence (Caniëls & Gelderman 2005, 145). If accepted, negative consequences should be reduced for example by holding sufficient safety stocks. Then again, if dependence is decided to be reduced, other solutions should be searched for. This may be difficult due to technical specifications, additionally switching costs may be quite high. Since it is possible that other options don't exist, this may require changes in assembly, which in turn would require cross-functional cooperation. Thus, it is necessary to weight which solution is best

in each case. In principle, until dependence is found harmful in the relationship, it is not advisable to make such radical changes, since by reducing the negative consequences of the dependence would more likely be more efficient if alternative suppliers aren't available in the market.

For leverage items, first possible strategy is to exploit buying power, if there is buyer dominance or power balance (Caniëls & Gelderman 2005, 145, 152). Yet, it must be noted that especially coercive strategies may have other negative consequences in the long run. Therefore, it is suggested to exploit buying power only moderately to achieve better outcomes for example in terms of contracts. Optionally, in the case of power balance it is possible to develop a strategic partnership (Caniëls & Gelderman 2005, 145, 152). However, it is not always necessary to develop a partnership even if it is possible, as partnerships require more resources than traditional arm's length relationships. It has been acknowledged that companies can be highly involved with only a limited number of suppliers (Gadde & Snehota 2000, 305). Moreover, partnership should be established only if it is seen to provide additional value to both parties. Thus, it is suggested that efforts to establish partnerships should be focused on items that are highly critical for product or project, or that are clearly technically superior to others in the markets. Yet, this is possible only with suppliers that are also interested in partnership. However, these kinds of suppliers should still be considered with higher importance than with others.

In terms of non-critical or bulk items, strategies are divided into pooling purchasing requirements and individual offering (Caniëls & Gelderman 2005, 146). It is possible to increase the power by pooling requirements as also the volumes increase. This would shift these items to leverage items, enabling the exercise of power. On the other hand, this may be difficult or even impossible as items are purchased mainly according to the needs of projects. Thus, it is also possible to continue individual ordering, but by pursuing efficient purchasing, which is suggested for most of the items.

In addition to managerial implications to the case company, this study provides others valuable insights on this specific industry, which has been previously studied only limitedly. Moreover, this study provides an example on how to apply portfolio model by finding suitable company-specific factors and how to consider power and dependence circumstances of the relationship, in addition to how these aspects effect on the development of management strategy for each relationship. As said, the results of the study may be found useful by other business units of the case company, but also by other

companies in the industry. Due to the nature of the industry, there isn't much public information on how actors in the field interact.

6.3. Reliability and validity of the study

Quality of the research is generally evaluated through reliability and validity. Reliability of the study refers to the extent to which study can be repeated so that same results are achieved. This can be improved for example by following protocol. (Stuart et al. 2002, 430) Reliability of the research was enhanced by clear processes of data collection and data analysis. Yet, even though the data collection and analysis processes were explained quite in detail, part of this study's empirical findings were based on the observations of the author. Lacking the insights gained by observation, would naturally change the results of the study, if it was repeated. Also, as the field of supplier relationship management is dynamic and thus constantly changing in the nature, results would be different when study is conducted in a different time.

In terms of validity of the study, it is likely that study's findings can't be widely generalized beyond the focused case company due to the unique characteristics and circumstances of the examined business unit. This means that results of the study will be valid mainly in the case company and other companies of the group. Additionally, results could be partly applicable in similar companies in the Nordic and to some extent in other companies working with or within the public sector. Sensitive and special nature of the industry, in addition to unique characteristics of the case company, narrow down the contexts where the results may be valid.

Results may be biased due to the limited number of interviewees and moreover their position in the business unit. However, by using also other sources of data such as observation and different documents, validity of the study was increased. Additionally, suppliers were excluded from the interviews. Their opinions may differ greatly from the buyer-sides opinions, which needs to be considered when evaluating the results of the study.

6.4. Limitations and propositions for future research

There were number of limitations in the study. In terms of unit of analysis, the focus was on dyadic relationship between the buying company and its suppliers. This left out the important aspect of second and higher tier suppliers as well as the aspect of networks. Moreover, the angle of the study was merely from the buying company's point of view. This left out the perspective of suppliers, which surely would have brought interesting aspects to the study.

Some limitations are related to the theoretical perspectives of the study. In terms of supplier relationship management process, focus was only on the stage of classification and on developing action plans regarding how the current relationships should be managed. Therefore, for example supplier selection or the contracting process were not discussed in this study. In supplier classification tools, the focus was on portfolio models as they have been recognized as they can be useful tool to analyze and organize the information and create a classification framework (Olsen & Ellram 1997, 103). Moreover, main focus was on the model presented by Caniëls and Gelderman (2005, 143) as it takes into account also power and dependence perspective.

There were found some potential areas for future research. First, is to include also suppliers' side to the study. Interviewing suppliers regarding their sources of power and dependence would give more comprehensive and realistic perspective on how they in fact consider power and dependence in the relationships. This would be helpful especially in developing different action plans for suppliers as evaluation of power relation could be enhanced. Moreover, future research could focus on how also suppliers' actions shift positions in the classification quadrants.

Another recognized area for future research is related to the network approach. By expanding the unit of analysis to the whole network, it would be possible to build on the existing research and widen the perspective to understand further the fundamental sources of power and dependence in the relationships. For example, as this study already showed, some of buyer's power may in fact derive from their customers' power. Likewise, the impacts of the phenomenon that sometimes suppliers of one project are customers of the others, could be studies further from network perspective.

Additionally, future research could focus on how the shifting the supplier from one portfolio quadrant to the another affects the relationship in the long run. Proposed action plans provide suggestions for how supplier relationships could be managed, but since in the dyadic relationship there are two parties, adjustments may occur in the interaction. Moreover, long-term effects of action plans may have an impact on how the relationship develops in the future.

6.5. Conclusions

The increasingly strategic role of supply management and need for strategic management of interorganizational relationships has been widely acknowledged, making also the theme of power relevant in the literature of supply management (Ahtonen 2009, 263; Emerson 1962, 32; Gelderman van Weele 2004; Cuevas et al. 2015, 149; Paulraj & Chen 2007, 29). Companies are always to some extent dependent on the resources of the other organizations, which creates differences in terms of power and dependence. These differences affect how supplier relationships should or could be managed, when considering the circumstances of the relationship as well as the characteristics of the purchased items. In order to differentiate management practices for different suppliers, it is necessary to classify them.

Supplier classification is a major element of supplier relationship management process, setting direction on how relationships are managed. Moreover, there are many possible ways to classify suppliers, but portfolio models have been identified to provide additional value despite the criticism towards the approach. In terms of portfolio models, Kraljic's model has been recognized as a dominant in the field and especially useful when dimensions of profit impact and supply risk are customized based on company specific factors. Yet, it doesn't sufficiently consider aspects of power and dependence. Thus, this paper applied the portfolio model presented by Caniels and Gelderman (2005). By this, study fulfilled its purpose to describe how suppliers can be classified by using portfolio model, while taking into account the existing power relations and dependency on suppliers. Application of the portfolio began with evaluation of the purchases based on profit impact and supply risk by assessing relevant company-specific factors. Then, supplier relationships were evaluated based on the power balance of the relationship. This was achieved by assessing company's sources of power and dependence. Finally, based on the assessments it was possible to provide action plans for each category and purchase

situation. Since the basic principle of resource dependence theory is to reduce the uncertainty concerning steady flow of supply by reducing the dependencies in those relationships and by increasing own power over others, the action plans provided guidance for manage to develop supplier relationships accordingly when it is possible given the circumstances. Therefore, study also succeeded to give guidelines on what kind of actions are required with each supplier group.

To conclude, this study provided one example of how portfolio model can be applied for supplier classification in a company operating in the field of defence, security and aviation, while considering power and dependence circumstances in the relationship. However, as the circumstances are constantly changing, also the portfolio model has to be updated consequently. Thus, this is not the end of the process, rather than one description of classification in the current circumstances of the presented case company. By this, the study has enhanced the understanding of applying portfolio model as a supplier classification tool, while taking into account the power and dependence perspective.

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APPENDICES

Appendix 1. Semi-structured interview form.

Supplier relationship management

- In your own words, what would you say that supplier relationship management is?
- What would you describe to be the main aims of supplier relationship management?
 - o What kind of factors affect reaching these aims?
 - o What elements you identify to be crucial part of SRM practice?
- What would you say are the main shortcomings of the current SRM practice i.e. why there's need for better?

Power relations and dependence

- In general, how would you describe the power position and dependence of the business unit?
 - o How do you think that suppliers see the business unit as a customer?
- The extent and ways how power and dependency affect the relationships with suppliers?
 - o How has this affected sourcing strategy?
 - o How this should be considered in SRM?
- Has there been activities to reduce the dependency or exploit power over suppliers?
 - o If yes, how?

Supplier classification

- In terms of profit impact, what kind of factors have an impact?
 - o In possible, give some examples.
 - o How these factors should be considered?
- In terms of supply risk, what kind of factors have an impact?
 - o If possible, give some examples.
 - o How these factors should be considered?

Open discussion

- Is there anything else related to these topics you would like to add?
 - o Something that should be taken into account in SRM or supplier classification?