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DEVELOPMENT OF GLOBAL MAINTENANCE PROCUREMENT MODEL

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ABSTRACT

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The objective of this thesis is to research the current state of maintenance procurement and identify the current challenges and problems to develop a new global maintenance procurement model. The thesis was conducted for a case company's mill maintenance outsourcing technology unit. The initiator for research was the limited professional procurement knowledge at mill maintenance sites and limited knowledge that how sites organize their procurement as there were limited intra-organizational cooperation. To study the issues and develop a model, connectivity of procurement process and global sourcing theories with the utilization of strategic alignment were researched.

The research is a qualitative case study, relying on subjective observation of researcher. Research data was collected from three selected case sites and company's internal operations by themed interviews and discussions, and company's internal documentation. The analyses of data were performed by using typology of content for data and comparing those to theory.

The degree of centralization was the main defining factor for model development. Also, the role of strategic alignment and thus, utilization of common processes was noticed to be a tool for organizing procurement process with strategic global sourcing. As a result of the research was developed a global maintenance procurement model as a framework and top-level process map. In addition, several recommendations for successful procurement process management and model implementation was introduced.

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Tämän Pro Gradu-tutkielman tarkoitus on tutkia kunnossapidon hankinnan nykytilaa ja identifioida sen haasteet ja ongelmat, jotta voidaan kehittää globaali kunnossapidon hankintamalli. Pro Gradu-tutkielma toteutettiin case yrityksen mill maintenance outsourcing teknologiayksikölle. Initiaattorina tutkimukselle toimi tunnistettu ongelma, että kunnossapitokohteissa on rajallinen hankintatietous sekä rajoitetusta sisäisestä yhteistöstä johtuen puutteellinen tieto, miten hankinta on kunnossapitokohteissa organisoitu. Jotta näitä teemoja voidaan tutkia ja kehittää uusi malli, tutkitaan teoriassa hankintaprosessin ja globaalin hankinnan yhteyttä strategialinjauksen avulla.

Tehty tutkimus on kvalitatiivinen tapaustutkimus, joka nojautuu osaltaan tutkijan henkilökohtaiseen havainnointiin. Tutkimuksen asiantietoa kerättiin kolmesta valitusta case kohteesta ja yrityksen sisäisistä operaatioista hyödyntäen teema-haastatteluja ja -keskusteluja sekä yrityksen sisäistä dokumentaatiota. Asiantiedon analyysit toteutettiin sisällön tyypittämällä ja vertaamalla tyypitettyä asiantietoa teoriaan.

Tutkimuksessa todettiin toiminnan keskittämisen olevan määrittävä tekijä mallin kehittämisessä. Lisäksi strategialinjauksen ja yhtenäisten prosessien hyödyntämisen todettiin toimivan työkaluna hankintaprosessin ja strategisen globaalin hankinnan organisoinnissa. Työn lopputuloksena kehitettiin globaalin kunnossapidon hankintamallin viitekehys sekä ylätasoinen prosessikaavio. Lisäksi useita ehdotuksia annettiin prosessin menestyksekkääseen johtamiseen sekä mallin käyttöönottoon liittyen.

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1 INTRODUCTION

Due to an increased research of supply chain management during the latest decade, procurement is nowadays considered as one key element of companies' performance. It is noticed that procurement is generating rather large share of costs compared to total costs of company, thus the possibility for savings is within this department. (de Boer, Labro & Morlacchi, 2001; Ruhrmann, Hochdörffer & Lanza, 2014) Even though procurement have significant effect to costs, the importance of developing procurement is still partly in its infancy on large multinational corporations (MNC).

From previous researches within supply chain management field, can be identified the terms supply management, procurement, and global sourcing. Most often there is a debate between terms purchasing and supply management (PSM), and procurement. In many researches those terms are often used interchangeably. Current academia is supporting the usage of PSM instead of procurement, whilst large MNCs are speaking about procurement. Because of the wide usage of term procurement in MNCs, and also within a case company of this research, procurement is utilized as a key concept.

In some literature, procurement can be categorized into direct and indirect procurement. (Kim & Shunk, 2004; Le Sueur & Dale, 1998) This division to direct and indirect procurement is meaningful due to a nature of a maintenance business. Basically all maintenance related procurement is considered as indirect procurement. But when maintenance is a service provided by another party, maintenance related purchases made to service provider's account are actually categorized into direct procurement. The reason for such analysis is rooted for a fact that maintenance purchases are included to final 'product', thus into final service offering. But it needs to be noticed, that despite of the procurement's division to direct and indirect procurement, theoretically the procurement process should remain the same.

The thesis is made for case company's mill maintenance outsourcing technology unit in order to develop procurement at their sites. Later on mill maintenance outsourcing business and sites will be referred as maintenance business and maintenance sites. In this thesis the focus is on organizing and controlling the procurement process in mill maintenance sites. It

is recognized that procurement development is needed, because there seem to be limited knowledge and control of procurement process at maintenance sites. These reasons are rather general and could be obstacles for different type of companies working in a global decentralized environment.

The reasons why procurement development is needed, are providing the starting point for the thesis as well. It is also considered that a general procurement process globally would improve the overall performance of sites in the long run. These are considered to be some of the practical challenges faced by mill maintenance sites currently. This thesis is aimed to identify (1) the current situation and challenges, (2) how those challenges could be resolved, (3) what are the success factors in procurement process, (4) what is the role of strategic alignment, and (5) finally to design the actual maintenance procurement model for the basis of further development and implementation.

1.1 Research objectives and questions

The purpose of this research is to study maintenance procurement in case company's maintenance sites located globally. Case company works in maintenance sites as a maintenance service supplier, i.e. as a service provider. The maintenance sites are located in several different areas, and the sites are under their area's management. The purpose emerges from the case company's need to improve procurement at their maintenance sites. It has been noticed that sites lack of procurement knowledge and actual procurement process. There are also rather insufficient knowledge how different sites manage procurement. Therefore, there is a need to develop a global maintenance procurement process.

Due to above mentioned issues, the purpose of this research is first, to study how the procurement is currently performed at maintenance sites. Secondly, it is aimed to study the intra-organizational cooperation in procurement between maintenance site and area. Thirdly, after discovering the current state of procurement best practices of procurement process and how intra-organizational cooperation can be integrated to maintenance procurement process will be studied.

In the end, the purpose is to design a maintenance procurement model. The maintenance procurement model will include a framework of the model and top-level process map. With top-level process description is aimed to improve the procurement knowledge of sites and process map is utilized to visualize the process and its continuity. Overall, in this research the scope is in identifying the actions and process in order to achieve successful performance in global maintenance procurement.

Research problem can be identified from previously introduced research objectives. The actual research problem is insufficient knowledge of current procurement processes and their inconsistency. One assumed issue is different contract scopes at sites. Thus, based on the study of the procurement practices' current state, the relevant themes to develop can be identified whilst designing the maintenance procurement model.

Therefore, the actual research question is as following:

How should a global maintenance procurement model be designed?

Beside of the previously mentioned issues, potential benefits of the case company's supply network are not fully utilized in maintenance sites' procurement. Therefore, another problem of this research is how the case company's supply network and its benefits could be utilized with full potential. This utilization is assumed to be connected to intra-organizational cooperation.

In order to find answers to the research problems, several sub-questions were formed. These sub-questions are supporting empirical analysis and constitution of answer for the main research question. The sub-questions formed are as following:

1. How procurement is performed currently at sites?
2. What are key sub-processes in procurement process?
3. What is importance of strategic alignment with company's strategy? How to align company's strategy into maintenance procurement model?

1.2 Literature review

Procurement have gained increased interest among researchers during the last decades when it was noticed that procurement covers rather large amount of costs related to companies' performance (de Boer, Labro & Morlacchi, 2001; Ruhrmann, Hochdörffer & Lanza, 2014). It needs to be noticed that nowadays, the literature is not using the term procurement but instead the term PSM.

In the research of van Weele and Rozemeijer (1996) was utilized terms purchasing, supply management and buying. They referred to purchasing and supply management with the term PSM. With supply management they were referring to strategic management of supplier networks. Nowadays, supply management is often defined as a long-term strategic function and management of acquiring goods and services with aligned operative capabilities to achieve the long-term goals. (Lintukangas, Kähkönen&Virolainen, 2013; Shin, Collier&Wilson, 2000) Another definition of supply management is introduced by Day and Lichtenstein (2006) as "practices that characterize the multiplicity of 'buy' activities and processes that firms engage in." In this research procurement as a term is utilized over supply management because the case company utilizes the term procurement in their business.

Another issue regarding to procurement, and especially maintenance procurement, is the categorization of procurement into direct and indirect ones. (Kim & Shunk, 2004; Le Sueur & Dale, 1998; van Weele&Rozemeijer, 1996) The categorization of procurement remains as a question in this thesis due to an emphasis on maintenance procurement. Therefore, this thesis aims to create an answer to the categorization of procurement from maintenance point of view, and thus bridge the identified gap in the literature.

Referring to the above mentioned issue, possible variations have to be considered during the research of procurement process. Usually the procurement process starts from the need identification and ends to the payment. Sollish and Semanik (2012), Burt and Pinkerton (1996), and Lysons and Farrington (2006) have focused on introducing direct procurement process in their books, and thus give the reader the whole picture of procurement process and its many sub processes. In order to search suitability of the process to maintenance procurement, also indirect procurement processes defined by Kim and Shunk (2004), and Le Sueur and Dale (1998), as well as service procurement process defined by van der Valk and

Rozemeijer (2009) will be compared. Therefore, the comparison of procurement processes and descriptions of procurement process will be forming the theory for procurement process itself.

Global sourcing is considered to be a strategic element in supply chain management operations, and globalization has increased its importance as a competitive advantage. Trent and Monczka have been extensively researching global sourcing during the last decades. They have defined a global sourcing continuum to state the degree of global sourcing practices in company (Trent and Monczka, 1999; 2002; 2003; 2005). It may be considered that global sourcing continuum and success factors have established position within global sourcing literature. Gelderman and Smeijn (2006) have been researching connectivity of global sourcing and purchasing in multinational company when there is centralized support for procurement but yet differentiation in purchasing and supplier strategies.

Baier, Hartmann and Moser (2008) identified that strategic alignment and purchasing efficacy are contributors to competitive advantage and business success. Rozemeijer (2000) has researched, how purchasing synergy can be managed in decentralized companies. The main contribution of his research is areas to stimulate co-operation and purchasing synergy within a company, and a hypothetical model to identify which approach of purchasing synergy could be used in a certain situation of company. Thus, his research could be used as a base for strategic alignment and identifying possibilities for intra-organizational cooperation in case company. Yenyurt, Henke Jr. and Cavusgil (2012) have researched intra-organizational cooperation in a decentralized business environment and their findings support the research of Rozemeijer (2000). Also Day and Lichtenstein (2006) found confirmation for the statement of previous researches that there is an impact of purchasing activities to firm performance when there is strategic alignment with business unit strategy.

Based on the literature review central topics related to this research could have been identified: (1) global sourcing, (2) procurement process, and (3) importance of strategic alignment. Even though a connection within the topics can be seen, there is not provided a model that combines all of them. Therefore, this thesis provides a holistic view to designing a procurement model including and combining the findings from each field.

1.3 Theoretical framework and key concepts

Certain aspects that help to identify theories utilized in this research can be seen both from research objectives and problems, and literature review. Those aspects are categorized under global sourcing and procurement theories, and are as following: centralization, strategic alignment, success factors, direct and indirect procurement and procurement process.

At first, the involvement of global sourcing and strategic alignment is utilized to study the effects and implementation of intra-organizational cooperation in maintenance procurement process. After that, it is important to research how direct and indirect procurement affect procurement process. At the end, global sourcing and procurement process theories will be combined into a tool for empirical analysis. The theoretical framework focus on these identified aspects and their connectivity. By constituting the theoretical background based on these categories, relevant empirical information can be further gathered in order to support the designing and development of the maintenance procurement model.

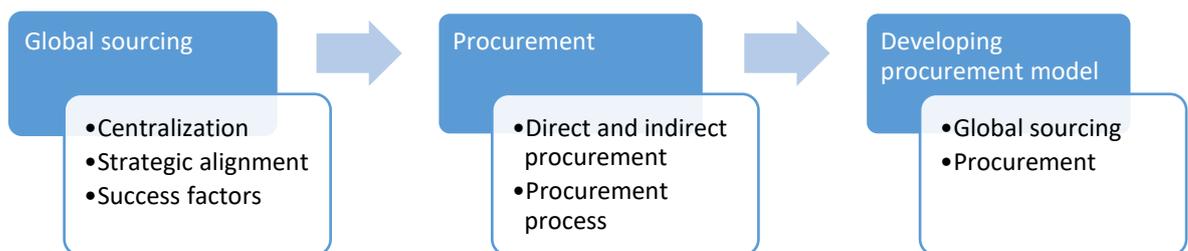


Figure 1. Theoretical framework

Theories defining this research can be seen from figure 1. First of all, global sourcing is the main theory, of which central aspects are centralization, strategic alignment and success

factor, in order to identify how does global sourcing as a strategic element may effect to procurement process. Secondly, procurement will be researched from process perspective and whether the type of purchase is effecting to process. Further the aim of the empirical part of the research is to identify how the procurement is managed currently at the sites regarding to the identified theoretical aspects introduced on Figure 1. Below will be described key concepts of this research.

Procurement is a continuous process of managing and deciding what, when, and how much to purchase, including supplier selection and evaluation, thus combining supplier management and purchasing in order to obtain suppliers or services in the most efficient way (Burt&Pinkerton, 1996, p. 2; Lysons&Farrington, 2006, p. 8).

Global sourcing ‘involves integrating and coordinating common items, materials, processes, technologies, designs and suppliers across worldwide buying, design and operating locations.’ (Monczka & Trent, 2005) In this research it refers to integration and cooperation of case company’s areas’ and maintenance sites’ procurement performance.

Strategic alignment refers to consistent corporate strategy and different business unit strategies. By aligning strategies is aimed to create consistency with case company’s areas’ performance and increase compliance of the maintenance procurement process. Strategic alignment is considered as a tool to add global sourcing to future procurement process in this research.

Success factors refer to the factors, which have proofed to be the best practices. Success factors are therefore in a key role in order to achieve successful procurement process, and those are highly important to do right when performing successful procurement process.

1.4 Limitations

Because sites’ contract scopes have a high differentiation and it is aimed to design a general maintenance procurement model, highly specified actions cannot be developed. Regarding to the contract scope differentiation, the maintenance procurement model will include a top-level procurement process description and process map as mentioned previously. The idea

is that general maintenance procurement process is introduced and the process map is helping to visualize how procurement could be performed at mill maintenance sites.

Sub-processes involved in procurement process vary within literature but in this research the main focus will be on planning, supplier selection and evaluation, and managing purchasing activities. These mentioned aspects of procurement will be discussed in the theoretical part, studied empirically, and used further to identify best practices. The identified best practices will be in a central role while designing the maintenance procurement model. The more specific solutions are limited to recommendations for further consideration of the case company.

Regarding to other sub-processes of procurement, the discussion is limited to what should be communicated, what kind of information need to be shared and how to control them. A good example of other sub-processes of the procurement process is inventory management. Inventory management has a central role in procurement but the detailed focus on managing inventory is out of the research scope. Inventories are included only to show the communication link to planning and purchasing.

In addition to research of maintenance procurement process, the possibilities how to utilize the case company's existing supply base are identified. Theory of utilizing case company's supply base involves intra-organizational cooperation and thus, may have effects to organizational structure. Therefore, organizational possibilities for the case company are limited to brief recommendations in this research.

In addition to service provider's procurement organization and structure, in mill maintenance sites the customer's procurement is also involved according to service contract's scope. There is different extent of service provider's procurement responsibilities at each site, but in order to keep this topic manageable, maintenance procurement model is focusing on organizing service provider's procurement.

Global sourcing is considered important when researching how mill maintenance sites could be combining utilization of local and global suppliers, and what are the most relevant factors affecting to site procurement. Global sourcing is also related to cooperation between all procurement 'operators': site procurement and area procurement. In order to keep the topic

manageable, global sourcing is limited to focus on the integration and cooperation between area procurement and maintenance site procurement.

1.5 Research methodology

The research methodology selected to this research is a qualitative case study. Certain facts were guiding this decision, such as imprecise research topics, no detailed problem areas, nor exact results to seek in the beginning. Qualitative research is suitable when the research is aimed to study (1) detailed variables involved in certain phenomena, (2) significance of variables involved in certain phenomena, (3) situations that cannot be arranged to an experiment or all variables of an experiment cannot be controlled, or (4) causations that are relevant to certain cases cannot be tested by an experiment (Metsämuuronen, 2006, p. 88). Therefore, previously mentioned characteristics of qualitative research support the deployment of the research problem.

A case study refers to certain type of data collection strategy in qualitative research (Metsämuuronen, 2006, p. 80). It is aimed to select one or more cases for an in-depth study. The in-depth study is conducted by different data collection methods in order to find the deeper understanding of phenomenon and to draw generalization of the phenomenon. A case study advantages are, e.g. (1) allowance for generalization, (2) data is often strongly true as it is based on the experiences of the researched objective, and (3) it constitutes descriptive data from which several interpretations can be drawn (Metsämuuronen, 2006, p. 91). Thus, it can be said that case study is suitable for this research as it is aimed to study few mill maintenance sites as cases to draw a picture of the current situation and to form a generalization of global maintenance procurement process.

1.6 Research structure

The structure of this research includes four main parts: introduction, theory, empirical analysis, and conclusions. In introduction is discussed the research objectives and problems,

defined the key terms, and set limitations for the research in order to have manageable content.

Theoretical part will be started by introducing global sourcing and its central topics, which can be seen to have effects to procurement process organization. In that part global sourcing's features of its organizing and benefits are comprised. There will also be discussed about global sourcing models from which can be selected a target state in empirical analysis.

The second part is about procurement process and will be started by identifying the special features of maintenance service business and through that to factors which may have influence to procurement process and its organization according to current literature. Definitions of procurement process and how different types of purchases effect to procurement process will be discussed at first. A theoretical procurement process and its identified sub-processes can be created based on to comparison of procurement processes.

Therefore, chapters 2 and 3 are presenting the key theories utilized in this research, that are relating to global sourcing and procurement process. In the end, it is supposed to consider what is the ideal theoretical state including global sourcing and procurement process, which can be utilized to analysis of maintenance procurement's current state. Thus, a tool for empirical analysis is theoretical combination of global sourcing model and procurement process.

Three case sites will be selected for the empirical part. Case sites' current procurement process is researched by theme interviews and observation. In addition to that, company's internal documentation will be utilized. Current state will be identified and analyzed according to empirical data gathered. Aim of the analysis is to constitute a base for designing improved procurement model by comparing empirical data to theory. At the end of empirical part will be introduced improved procurement model and recommendations. On conclusions will be discussed, about developed maintenance procurement model, and answered to research questions i.e. introduced identified success factors.

2 GLOBAL SOURCING

Global sourcing has been a central term within purchasing and supply chain management research for several years. The increased globalization and companies' pursuing continuously to improve their competitive advantage have been dashing the need of global sourcing. Global sourcing is a strategic decision affecting to early phases of procurement process. Regarding to the competitive advantage of multinational companies, it seems that reasoning for implementing global sourcing are location related. It means utilizing also local supply and labor markets and company specific competencies, which can be enhanced e.g. by pooling the requirements of sites (Trautmann, Bals&Hartmann, 2009). Another perspective is to consider global sourcing as a part of lean approach. This can be defined by the aim of lean concept, which is to focus on core competencies and decreasing internal value chains. The connection between global sourcing and lean becomes from the fact that procurement is considered to be one of the most important value chain activities nowadays. (Arnold, 1999)

Global sourcing in multinational companies has been recognized to include three core elements: centralization, coordination, and standardization (Quintens, Pauwels&Matthyssens, 2006a; Ghoshal&Nohria, 1989; Quintens, Pauwels&Matthyssens, 2006b; Arnold, 1999). These elements are creating the difference between global sourcing and international purchasing regarding to the scope and complexity because e.g. both horizontal and vertical integration within procurement process are required in global sourcing (Trent&Monczka, 2002).

Elements of global sourcing are about organizing and controlling the global sourcing process. Therefore, the first step to identify is the degree of centralization, which refers to organizational structure. With coordination and standardization are referred to managing and controlling the process, as well as aligning of methods, tools, and strategies.

Degree of centralization

A degree of centralization is perhaps the most discussed element of global sourcing in the literature. Ghoshal and Nohria (1989) define centralization as governance mechanism with hierarchical decision-making process, in which strategic and policy decisions are made in

headquarters. In a larger extent, the degree of centralization is defining the organizational structure and the possibilities in it to improve the processes. Degree of centralization can be described on a certain scale shown in figure 2 below.

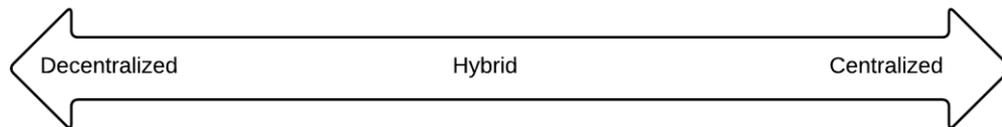


Figure 2. Scale for degree of centralization

Degree of centralization is often either centralized or decentralized. But also a hybrid structure, which combines both centralization and decentralization is possible. (Gelderman&Semeijn, 2006). The degrees of centralization are described in figure 2 above. Leinonen (1999, p.82) gave a matrix organization as an example having both centralized and decentralized control. This issue of matrix organization having a hybrid structure was emphasized also by Hartmann, Trautmann and Jahns (2008). In matrix organization there are both corporate and regional coordination and control of decentralized sourcing processes. Hartmann et al. (2008) also consider that the dispersed purchasing knowledge may be one of the major factors influencing further to organizational design of purchasing. One solution is to divide sourcing processes as following: “development and management of the organization’s sourcing strategy should be centralized, while low-value adding sourcing activities should be decentralized” (Leinonen, 1999, p.83).

Rozemeijer (2000) summarized the factors that motivate targeting to more centralized purchasing: ensuring the actions towards to supply shortages and long-term availability, responsiveness to changing business context, seeking profitability through reduced supply costs, improving the professionalism of purchasing personnel, and supportive corporate structure to realizing purchasing synergy. These factors supporting centralized purchasing along with success factors are promoting long-term cost savings and increased availability.

Coordination

According to Leinonen (1999, p.89) coordination refers to managing both operative and strategic sourcing in consistency, despite of the location or business unit in multinational corporations with aligned sourcing efforts. Another definition of coordination is by Ghoshal and Nohria (1989) who utilizes term formalization over coordination. They define formalization as “routinization of decision-making and resource allocation” in order to decrease bureaucracy within a company. As an example of managing sourcing activities in a coordinated way, Leinonen (1999, p.89) mentioned the importance of managed supply base. Coordination issues for supply base can be either towards utilization and development of common global sources, or development of common processes, e.g. selecting and evaluating suppliers.

One perspective is to consider coordination as optimized sharing and using of information between global operating units (Yeniyurt et al., 2013). Even though the sourcing process is coordinated, local and global functions and information gathering can be divided. Local units could be utilized to manage local suppliers, while global centralized unit can utilize their resources to wider analyses, e.g. make-or-buy analyses and supplier audits. (Leinonen, 1999, p. 90) This refers to different types of coordination, which was also identified by Quintens et al. (2006a). They considered that a type of coordination is important to support either centralization or decentralization. The four types of coordination, are 1) coordination according to the largest purchaser of product or the user that locates on the same country that supplier, 2) coordination of purchasing activities defined by headquarters, 3) coordination of purchasing activities through regional purchasing groups, and 4) coordination through profit-oriented purchasing centers for in-house selling of purchasing services. (Quintens et al., 2006a)

Standardization

Ghoshal and Nohria (1989) utilizes normative integration referring to standardization. From their perspective it is all about targeting to shared goals among subsidiaries and headquarters by pooling their goals. Instead, Quintens et al. (2006a) have defined standardization of global sourcing for process, product and purchasing personnel standardization.

Process standardization is considered similar to degree of centralization but will focus on screening of suppliers, supplier selection, negotiating and contracting, and supplier evaluation and follow-up according to standardized rules in all business units. Process and purchasing personnel standardization are perhaps the most important when global sourcing is aimed to develop further. Purchasing personnel standardization means requiring and ensuring common capabilities for employees, and common way to manage personnel. Product standardization refers to certain parts of all products produced, which are defined in a standardized manner regarding to e.g. quality.

2.1 Success factors

The success factors of global sourcing are tightly related to the successful implementation of procurement process with global sourcing elements, and management of suppliers. The success factors are giving insight what support functions there need to be included to managing the process. The success factors of global sourcing are: management commitment, well-defined processes, availability of resources, information technology, organizational design, communication and measuring savings. These are introduced shortly below.

Management commitment

Support of management can be considered to be a base for global sourcing operations. Without committed management, performance of business cannot be improved. Management commitment refers to the guidance and support from executive management to ensure implementation and development of global sourcing operations, as well as the long term global sourcing strategy. Aside of providing support, the executive management is responsible to provide the budgets and other resources that supports the initiatives and operations of sourcing. (Trent&Monczka, 2002; Mohamad, Julien&Kay, 2009)

Well-defined processes

Whereas management commitment can be considered to be a base for global sourcing operations, another important step for implementation and performance of those are well-defined processes. Practically, the processes involve purchasing needs and objectives and

supplier management (Mohamad et al., 2009). With the help of well-defined processes can be ensured the alignment of operations, resources and practices worldwide, and limit the operational differences that are occurring naturally. (Trent, 2007, pp. 248-249)

In a well-defined process is involved skilled persons who adapts global sourcing thinking over local or regional sourcing thinking, actions to continuous improvement, and continuous management, review and re-establishment of contracts. (Trent&Monczka, 2002) In addition to these well-defined process should include coordination and development global strategies in regular basis, involving cross-functional and cross-locational teams to developing strategies, leadership communicating a clear vision, global suppliers, and internal customer buy-in to global agreements. (Trent, 2007, p. 249)

Availability of resources

The importance of skilled and qualified persons was already mentioned in well-defined processes. It is the task of executive management to identify and make available those critical resources (Trent, 2007, p. 245). From the skilled and qualified persons in global sourcing operations are required a holistic view of the world within the process, but it is also relevant when solving obstacles that occur in buyer-seller environment (Trent, 2007, p. 251; Mohamed et al., 2009). Access to complete, reliable and timely information is vital in order to ensure that skilled and qualified persons have sufficient tools to perform their work (Mohamed et al., 2009).

Information technology

Utilization of information technology is increasing its role as a central tool of managing operations, thus it is a key factor to coordinate and timely communicate within different geographical locations. This makes it as a key factor to global sourcing and managing both intra- and interorganization processes (Trent&Monczka, 2002).

Information technology offers various possibilities for utilization, but for the purposes of global sourcing, global data warehouse is most often proposed solution. The utilization of intranet is another tool in order to share internal documents, guidelines, templates and information regarding to process updates. (Trent&Monczka, 2002) In order to provide that information is actually relevant, there should be identified the common requirements and

rules for buying units (Mohamad et al., 2009). In addition to internal information sharing, the information should be provided between the suppliers. Basically the information shared to suppliers is related to timely details of performance, e.g. quality, delivery, and cycle time. (Trent, 2007, p. 250)

Organizational design

According to Trent and Monczka (2002) the organizational design should lie to cross-functional and cross-locational teams which have support and steering from functional and executive management in a form of leadership and guidance. Instead, Mohamad et al. (2009) was more focusing on the structural design by suggesting to encourage establishment of international purchasing offices in source markets that support global sourcing requirements.

Organizational design is also supposed to support the division of strategic and operational activities of global sourcing. This division of activities is meant to do between executive management and cross-functional teams. (Trent, 2007, p. 246) The main responsibility of the organizational group is to observe the process from the perspective of sourcing strategy development, identification of global opportunities, and development of sourcing agreements (Mohamad et al. 2009).

Communication

To ensure successful communication throughout the global sourcing process, the timely and accurate communication should be provided both internally and externally with suppliers. Communication methods and mechanisms used are aimed to support the coordination of activities in global scale. In a communication factor cross-functional teams, and executive management review and coordination regarding to strategy's development are emphasized (Trent&Monczka, 2002). Externally, the communication with suppliers is considered important to establish and maintain long term relationships. In order to establish the communication with suppliers, Mohamad et al. (2009) emphasize the importance of cultural compatibility and language similarity.

Measuring savings

Success factor of measuring savings can be considered to include both cost savings and performance measurement of suppliers, and the potential benefits achieved by global

sourcing initiatives (Mohamad et al., 2009). Concerning the global sourcing, measuring is important to measure both aspects, as one of the key factors is continuous development and improvement. The potential savings of global sourcing are possible to measure when calculating financial projections of the company. Instead, the suppliers' performance can be measured during the site visits. (Trent&Monczka, 2002)

2.2 Strategic alignment

The importance of strategic alignment related to procurement and global sourcing is, that it helps to improve the practices and performance while ensuring better coordination and control throughout the company despite of geographical location (Faes, Matthyssens&Vandenbempt, 2000). Strategic alignment can be applied to any function of the company, but here it is referred to the alignment of purchasing practices. Thus, strategic alignment is considering harmonization of site procurement with company strategies applied through area procurement in multinational environment. By adding strategic alignment dimension is aimed to introduce common practices of procurement to the maintenance procurement model.

Strategic alignment is tightly connected to elements of global sourcing, as it is combining the integration, coordination, and standardization in order to achieve e.g. common purchasing practices and purchasing synergy. In the context of procurement and global sourcing, strategic alignment is often connected to purchasing synergy. With the purchasing synergy is aimed to achieve the added value by cooperating and combining the capabilities of two or more business units (Rozemeijer, 2000). Thus, purchasing synergy is often connected to pooling of purchases, which is utilized to gain competitive advantage by combining items or services with common specifications in decentralized environment (Smart&Dudas, 2007). Strategic alignment is one of the key parts in global sourcing by defining and implementing the operations and policies from top level management to daily performance of business units. Hence, strategic alignment can be considered as a tool to create a link between global sourcing practices and procurement process.

When speaking of strategic alignment regarding to procurement, it is often referred to increased purchasing integration. Purchasing integration is the internal set of purchasing

plans, policies and actions for cross-functional priorities and business goals. The internal set of purchasing practices are determined by aligned strategic purchasing practices and company's goals to achieve fit between practices and business's objectives. (Day&Lichtenstein, 2006) For example, the common or similar procurement process in business units is one possibility of strategic alignment.

Day and Lichtenstein (2006) suggest that procurement is a firm-level construct, extended from purchasing practices construct, which involves alignment between purchasing practice and strategic behavior instead of generic business goals. This confirms that purchasing practices influence to firm performance when there occurs strategic alignment between purchasing practices and business unit strategy (Day&Lichtenstein, 2006; Baier et al., 2008). Another approach to strategic alignment within procurement was introduced by Beukers, Versendaal, Batenburg, and Brinkkemper (2006). In their research was created Procurement Alignment Framework (PAF), which integrates concepts of procurement maturity, alignment and segments. This means that strategy and policy, monitoring and control, organization and processes, people and culture, and information technology should be aligned. (Beukers et al., 2006)

With strategic alignment can possibly be improved purchasing competence by comprising supply base leveraging, supplier relationship development and supplier evaluation (Day&Lichtenstein, 2006). Therefore, with strategic alignment can be introduced the common processes and practices, as well as improve purchasing competence also in decentralized environment. As the essence of strategic alignment is basically to align the processes and performance of different functions throughout the company and its business units, there are certain forms to apply for alignment. Rozemeijer (2000) defined that strategic alignment can be applied as any of the six forms:

- pooled negotiation power: identifying and pooling the common needs in order to achieve greater leverage over suppliers, and thus, possibly reduce costs or improve quality of the purchased items or services.;
- sharing intangible resources: with intangible resources are meant information and knowledge which can be shared between the business units regarding to particular process, function or geographic area. Sharing intangible resources may improve the units' position in the market.;

- shared tangible resources: utilizing pooling, e.g. for purchasing information and communication systems in order to increase economies of scale and avoid duplicate effort.;
- vertical integration: coordination of products and services between two units in order to achieve possible reduction of inventory, or increase utilization of capacity.;
- coordinated strategies: increasing the synergy by aligning two or more business units' strategies, which can be difficult to achieve.; or
- combined business creation: combining know-how of several business units to facilitate the creation of a new unit.

With the forms of strategic alignment can be increased the level of purchasing synergy along with the degree of centralization. Thus, the benefits of purchasing should be taken into consideration when there is a possibility to strategic alignment. Those benefits can be said to be the following: better internal information flow, improved negotiation strategy, cost savings, better impact on monopolistic supply markets, and increased visibility to market and cost structures (Rozemeijer, 2000). Due to following benefits, the potential strategic alignment form to utilize for global maintenance procurement model design is beneficial to evaluate. It is also beneficial whilst global sourcing element is aimed to include into procurement process.

2.3 Global sourcing and procurement

While the success factors are advising how global sourcing activities should be managed, the global sourcing models provide the structural framework how to organize the operations. Global sourcing models are providing the analytical tools to evaluate current state of process, and thus as a result helping to find the target model. The global sourcing models are supporting the organization and coordination of procurement process. Global sourcing element in procurement is offering the addition of strategic perspective to operational sourcing and purchasing, through which is possible to gain more benefits both with improved processes and internal purchasing synergy.

As the global sourcing models, especially the ones by Arnold (1999), are focusing on processes from organizational point of view. It can be said that those models offer tools to

consider different organizational structures which could be applied when organizing procurement process with global sourcing element. Instead, as relation to global sourcing and its main elements, e.g. strategic alignment, the models can be used to help applying company level strategies into smaller dispersed units.

Two analytical frameworks for global sourcing, that have been utilized the most during the years was identified from the literature. Those models were Arnold's (1999) internationalization and centralization framework resulting to three different global sourcing models, and Trent and Monczka's (2002) levels of global sourcing. Both of the frameworks are based on the degree of centralization and internationalization, which are considered as two main factors defining the global sourcing.

The main focus of Trent and Monczka's (2002) model is to describe the levels according to internationalization of the purchasing function. Only the levels three, four and five are considering both centralization and internationalization. Instead, the Arnold's (1999) model is analyzing both centralization and internationalization in own matrixes before connecting them together. When considering the elements and factors of global sourcing, centralization covers the organizational structure and strategic alignment requirements, whilst internationalization is related to the spreading of the business worldwide.

Arnold (1999) defined internationalization to four actors (see the figure 3 on page 28):

- domestic player: no international activities in any value chain;
- global player: international activities in all value chains;
- global sourcing deficit: low level of global sourcing but generally international company; and
- global sourcing focus: high level of global sourcing but low interest towards to international activities.

Instead, in the framework of Trent and Monczka (2002), the levels of global sourcing refer to internationalization and centralization as following:

- level I: only domestic sourcing;
- level II: interest and progression towards to basic international purchasing;

- level III: strategies approach to worldwide supply market but are not well coordinated;
- level IV: integration and coordination of requirements through central coordination; and
- level V: horizontal and vertical integration within cross-locational purchasing.

Regarding to internationalization, both of the frameworks define domestic sourcing as the lowest level, whilst the coordinated international value chain activities are considered to be the highest level. The other levels of Arnold's (1999) framework focus on the distribution of internationalization between company's general performance and procurement process, whereas Trent and Monczka's (2002) framework focuses on the intentions of utilizing international purchasing. Internationalization in procurement and sourcing can be considered to increase the amount of potential suppliers possibly with increased cost competitiveness. Increased internationalization and thus wider supply base may also promote the buyer organization's global market position.

Centralization, is considered as a key strategic issue in current business environment, and high degree of centralization is emphasized as a target position. Nevertheless, low degree of centralization is currently seen in most organizations' procurement and global sourcing functions. Centralization is considered mainly in the last two levels of the framework of Trent and Monczka (2002). In the level four, is mentioned partial integration of requirements through central coordination, and in the level five, is mentioned centralized purchasing provided by horizontal and vertical integration. Arnold (1999) instead divided the degree of centralization into four actors similarly to internationalization actors. The centralization actors (see the figure 3 on page 28) are:

- hierarchical structure: high centralization in general and in procurement;
- atomized structure: high decentralization in general and in procurement;
- hierarchical purchasing structure: high decentralization in general but centralized procurement; and
- atomized purchasing structure: high centralization in general but decentralized procurement.

The advantage of Arnold's (1999) models is that those consider the possibility of hybrid structure regarding to centralization. It is a possible structure to consider if there are several

dispersed units and several different purchasing needs, which cannot be completely centralized, e.g. if there is high demand for local service providers. Centralization is also a key issue when global sourcing is aimed to include to procurement process, as the capability and resources must be considered.

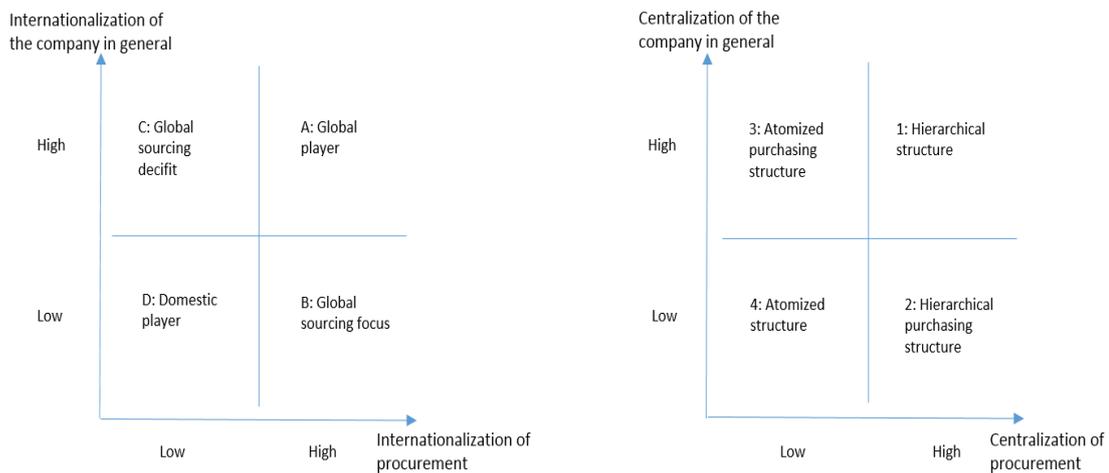


Figure 3. Phase one for analyzing the state of global sourcing (Arnold, 1999)

The current level of global sourcing can be found by analyzing the centralization and internationalization according to Arnold's (1999) matrixes on figure 3 or by utilizing the levels and success factors of global sourcing according to Trent and Monczka (2002). Arnold (1999) continues the analysis by the third matrix, which combines centralization and internationalization levels, see figure 4 on page 30. Depending on the location of the company's situation in that matrix the global sourcing model as well as the possible target model can be identified. The global sourcing models identified are introduced shortly below.

Central purchasing model have the highest degree of centralization but the lowest degree of internationalization. Thus, it is applicable on cases where the company's global sourcing ratio is low and there is no point for decentralized procurement, e.g. by area. Therefore, in this model procurement is handled centralized by bundling demand and having a clear process. This model can be applied partially, as well. If applied partially the centralization may refer only e.g. to supply management and contract management. (Arnold, 1999) If considered large MNCs central purchasing model may not always be fully applicable, because there are several dispersed units within areas and the nature of purchasing needs.

Instead, partially applied, the utilization of common contract forms would be beneficial for smaller units. In procurement process this model could be seen as increased amount of internal information sharing between the centralized procurement function, who further coordinate the purchases.

Coordination model, instead have similarly high degree of centralization but yet a high degree of internationalization when compared to central purchasing model. By centralization is now referred to cooperation between areas and business units. In this model the advantage is in combining independent business units and their market know how with demand bundling in purchasing. (Arnold, 1999) Coordination model could perhaps be considered as the ideal model of centralized global sourcing, as it combines horizontal cooperation of business units with area level sourcing. In this model area level procurement and sourcing are responsible of pooling the demands of business units while utilizing their market know how. This model would be applicable if MNC's strategy requires internal centrally lead horizontal cooperation across the company. Coordination model could be seen in procurement process as increased information sharing between unit and area procurement regarding to purchasing needs and market know how.

Outsourcing model, in this last model, high degree of internationalization but low degree of centralization is recognized, thus referring to cases where company has highly decentralized but international operations. The aim is to outsource, i.e. focus the procurement process related to global purchasing to separate procurement function buying from specific foreign supply market to the business unit located there. This model supports the business units' and their purchasing functions autonomous and decentralization, but adds the global sourcing dimension. (Arnold, 1999) Outsourcing model could be considered when MNC has several international operations dispersed globally, but which are not vertically or horizontally cooperating together. In those cases, it is also seen high utilization rate of local suppliers, but if there is willingness to utilize global suppliers as well, centralized global sourcing could be considered. Therefore, the centralized global sourcing could be organized by outsourcing that process to area managed procurement. This could be seen in procurement process as increased information sharing between site and area procurement during quotation and selection phases.

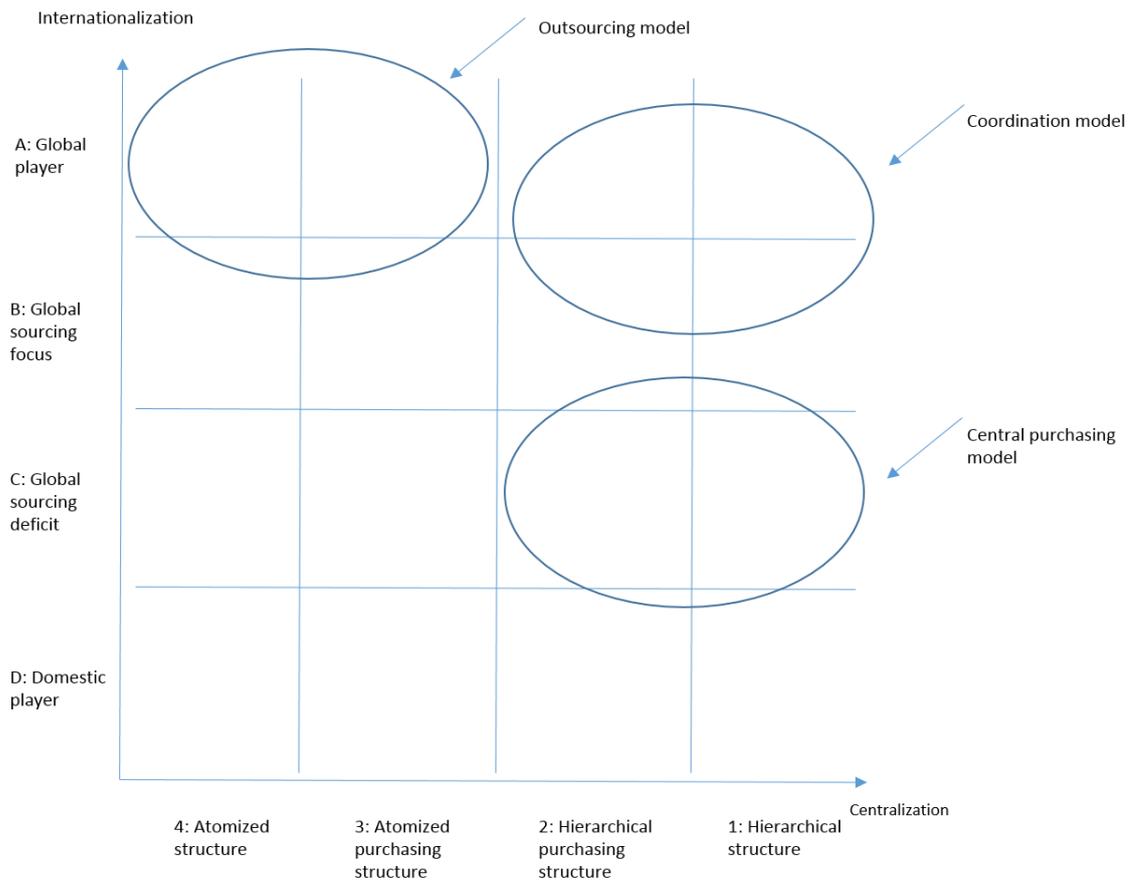


Figure 4. Phase two for analyzing the state of global sourcing (Arnold, 1999)

Arnold's (1999) framework is chosen for the further analysis of the current situation in this research. The reasons are that it provides more comprehensive phases for analysis and, because it describes how the global sourcing should be organized while considering the whole procurement process (Arnold, 1999). The matrixes utilized for analysis can be seen above on figures 3 and 4.

Elements of internationalization and centralization are affecting to whole process organizing. The selected model affects throughout the procurement process by offering e.g. utilization of common information systems and documents, criteria for supplier selection, existing supplier base, and tools and KPIs' for supplier evaluation. Therefore, it can be said that global sourcing model is offering controlled processes and tools for daily procurement in all business units. In addition, by utilizing global sourcing model and its structure while integrating global sourcing into procurement process can be considered to achieve several benefits. Certain benefits are e.g. pooling demand and thus creating internal purchasing

consortium which will lead to increased purchasing and negotiation power and potential new sources for partnerships.

As stated already, high degree of centralization is considered as an ideal state regarding to global sourcing. Thus, coordination model by Arnolds (1999) would be the most ideal for organizing global sourcing. Therefore, this global sourcing model is performing as a theoretical state in which empirical data will be compared. These matrixes for global sourcing analysis and coordination model are combined with theoretical procurement process in order to analyze data and design the improved maintenance procurement model.

3 ORGANIZING PROCUREMENT PROCESS

Regarding to successful performance of procurement, Brandmeier and Rupp (2010) researched best practices of procurement. As a one outcome of their research was identified dependencies of key features to procurement unit/function, which could then successfully apply procurement levers. Dependencies are shown in figure 5 below. Procurement levers identified are: pooling, negotiation concepts, global sourcing, supplier portfolio, supply chain integration, procurement process, supplier value integration, supplier development, standardization, redesign/design to cost, simplifying technical specs, and target costing. These procurement levers are considered to be the success factors when applied in practice.

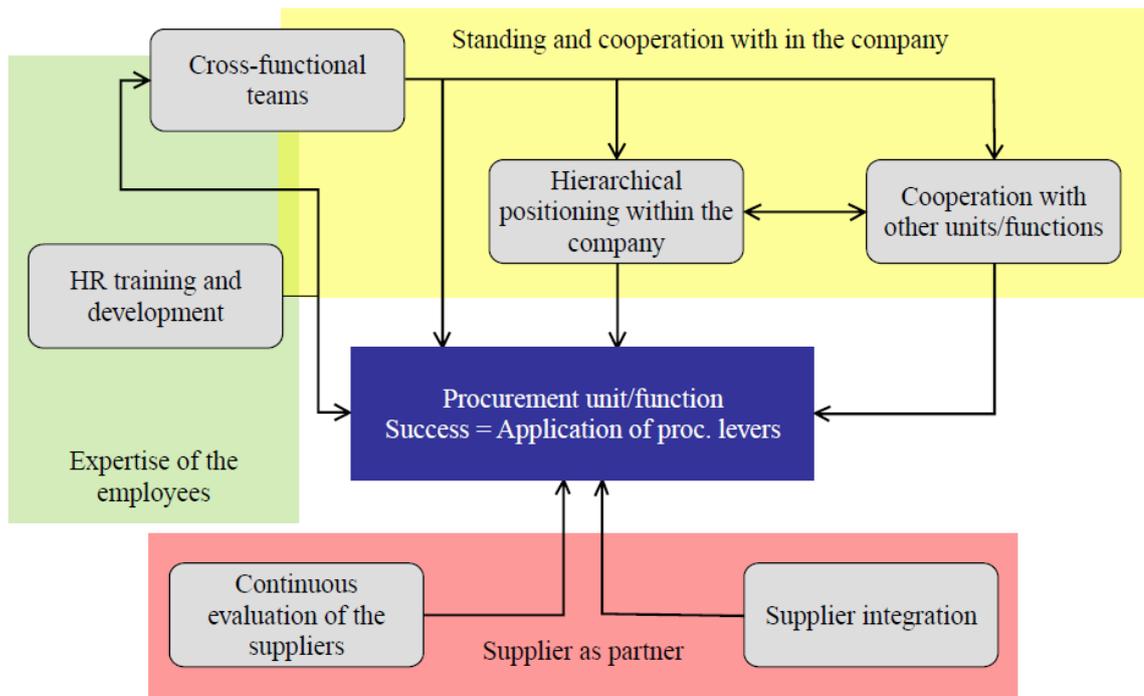


Figure 5. Dependencies of key features to procurement unit/function (Brandmeier&Rupp, 2010)

Both global sourcing and procurement process are included into procurement levers, i.e. success factors in the research of Brandmeier and Rupp (2010). Therefore, it can be assumed that improving global sourcing and procurement process at mill maintenance sites, the procurement performance should improve. From figure 5 can also be seen that intra-organizational cooperation and supplier relationship management are affecting significantly to procurement unit, and thus to global sourcing and procurement process organization.

The cost saving possibilities through managed and coordinated procurement are often emphasized in researches. Instead, in the research of Talluri and Narasimhan (2004) was identified other objectives in company's procurement and supply management. The objectives identified were: improved quality of purchases, reduced lead-time and improved on-time delivery, developed long-term relationships with key suppliers, and secured global competitive pricing. These objectives are important to consider and evaluate in addition to objective of cost savings, when considering implementation and development of current and new processes. These objectives are also important to considered if purchasing strategy is developed later on.

Because procurement is a continuous and long-term process, affected by several features, it may enable potential cost savings for company and improved service levels for end customers. In this research, the studied procurement process is a part of end service, maintenance service. Due to that fact, also other than procurement definition related issues need to be taken into consideration as well.

The first thing that may affect to organizing procurement process is related to maintenance and procurement relation to each other's. A practical 'definition' of maintenance from daily life is that it consists of management and procurement. Therefore, it can be considered that there cannot be proper maintenance without properly managed procurement process. Another issue is the attitude towards to the type of procurement. This means that whether maintenance procurement process is considered to be direct or indirect according to traditional definitions.

Therefore, it is needed to define how procurement is related to maintenance service providing, and whether it should be considered to be direct or indirect and does that make difference to the process. After defining these issues and their effects to procurement process, the actual process is introduced.

3.1 Procurement in maintenance service

The importance of maintenance outsourcing business is considered meaningful for industries where physical assets are in a central role (Tsang, 2002). When selecting outsourcing over

in-house function the benefits such as focusing on core business, accessing highly specialized service at competitive costs and sharing risks are in a main role. (Godoy, Pascual&Knights, 2014)

To describe a maintenance service business and procurement as part of that service, the nature of maintenance and its relevance to production and enterprise profits will be described. Maintenance and its relevancy for companies was described in the research of Tsang (2002) whilst focused on the strategic dimensions of maintenance. The relevance of maintenance for production and the enterprise is described in an input-output model below.

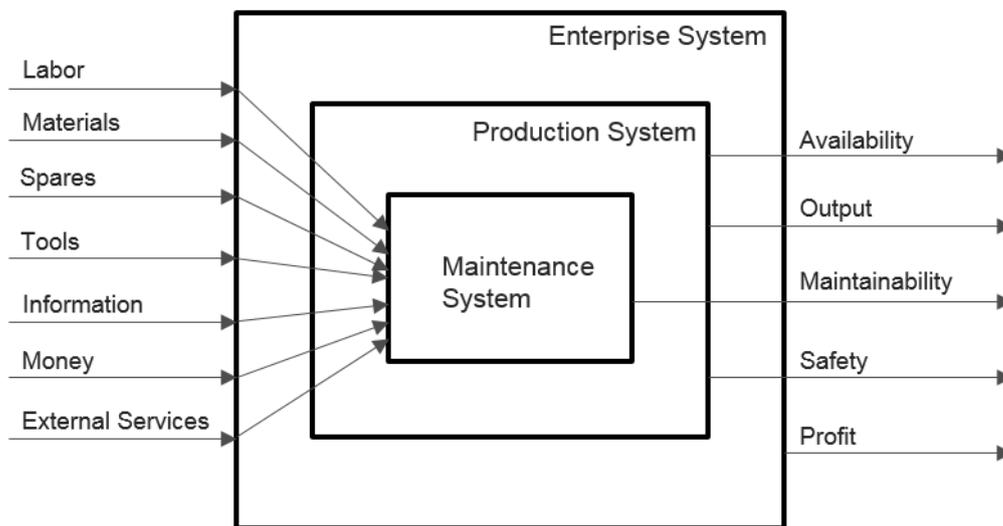


Figure 6. Maintenance as part of Enterprise System (Tsang, 2002)

From the figure 6 above can be seen, that maintenance is in a central role for production and affecting directly to the profit the company is gaining. Thus, maintenance outsourcing as a business is aimed to deliver improved business performance for the customer. The role of maintenance outsourcing is considered to be a main driver for serving potential to cost benefits and enhancing performance (Godoy et al., 2014). The connection to cost benefits and enhanced performance is that the maintenance performance influences to “availability of production facilities, the volume, quality and cost of production, as well as safety of the operation” and further to the profit of the enterprise (Tsang, 2002).

As can be seen from the figure 6, the relevant inputs to maintenance systems are labor, materials, spares, tools, information, money and external services. From the inputs five out

of seven are the ones that are usually purchased from other parties. Therefore, the procurement's role for maintenance and further to the businesses' profit is high. Because these inputs have a role for the customer company's profit, there are different solutions and division of responsibilities of purchasing the inputs. The responsibility of purchasing and the inputs are clearly defined in contracts.

For a maintenance service provider, the profitability of outsourcing contracts is the most important factor. Godoy et al. (2014) have considered that spares policies are affecting significantly to contracts profitability. They have identified that traditionally either the service provider or service customer is responsible for spare parts controlling they try to maximize benefits separately, whilst "critical spares stock holding is a supply chain lever to keep maintenance outsourcing viable for the parties involved." (Godoy et al., 2014) When integrating the idea of Tsang's (2002) research, the responsibility of purchasing related to other inputs along with spares affects directly to the profitability of the service provider. Thus, the impact of procurement, and trust between service provider and customer are the keys related to shared ownership structure and enhanced profitability for both organizations.

3.2 Direct and indirect procurement

The main division of procurement and purchases are traditionally to direct and indirect ones. With direct procurement is meant the purchases of materials, spare parts and services which are ending up to a final product. Instead, with indirect purchases are meant materials, spare parts and services, which are supporting the production. Therefore, maintenance procurement according to traditional division is considered as indirect one. In the context of indirect procurement, maintenance procurement is often discussed as maintenance, repair and operation (MRO) purchases. Jeeva (2008) emphasized the role of inventories for MRO parts, but also the difficulty and complexity in sourcing due to irregular need of purchases.

Due to a nature of MRO purchases, one difference to separate direct and indirect procurement is, that direct procurement can be better planned and scheduled. The reason for this is derived from more sufficient information of demand, and secure and reliable sources of purchases (Kim & Shunk, 2004). Thus, the flow of goods and services during the process is considered to be more efficient.

Another relevant difference between direct and indirect procurement is the turnover per item. It is considered that maintenance items and services can possibly cover 80% or even more of purchaser's work but count less than 20% of purchasing turnover (Le Sueur & Dale, 1998). From this point of view, it should be important to focus on controlling the indirect procurement costs when seeking the cost efficiency and profitability. Traditionally, the main assumption for cost savings from indirect procurement has been purchasing low cost products or materials so the inventory holding costs stay low (Le Sueur & Dale, 1998). In theory the cost saving proposals have been changed towards to better control of procurement process instead of seeking products or materials for the lowest costs. This change is concerning both direct and indirect procurement.

When reflecting this traditional division of procurement to the business for which this research is made, a relevant question remains that should the maintenance procurement be defined either direct or indirect one. In maintenance outsourcing business, e.g. a paper producer has outsourced their machines' maintenance for another company, thus the company acts as a service provider whom end product is a maintenance service. Therefore, when thinking the definition of direct procurement, maintenance related purchases made for maintenance service provider's account are actually direct ones. This means that procurement costs have bigger influence to maintenance outsourcing business' profitability at sites.

3.3 Procurement process

Procurement process is considered as a continuous process, which contains cooperation and coordination of several operations both internally and externally. In addition to cooperation and coordination, the process includes several decisions and analyses to be performed. Without a thorough understanding of requirements and purposes for supplies or services, efficient and effective procurement process cannot be guaranteed.

As mentioned before, one relevant issue for organizing procurement process is to research, whether the procurement process is depending on the type of procurement, thus whether the purchase is direct or indirect one. Therefore, to research that dependency and to define the process, several procurement processes were searched from the literature. Below is collected

the procurement process descriptions from various sources, and those are presented on table 1 below.

Table 1. Conclusions of different procurement processes in literature (Burt&Pinkerton, 1996; Sollish&Semanik, 2012; van der Valk&Rozemeijer, 2009; Le Sueur&Dale, 1998; Kim&Shunk, 2004; Lysons&Farrington, 2006)

Procurement process		
Burt and Pinkerton (1996): -production planning and inventory control -what to buy -purchase description -to make or buy -supplier selection -negotiation -strategic supply management	Sollish and Semanik (2012): -sourcing management -solicitation of bids and proposals -supplier selection -negotiation -contracts -supplier relationship management	van der Valk and Rozemeijer (2009): -specify -request for information -detailed specification -select -contract -order -expedite -evaluate
Le Sueur and Dale (1998): -identify need -product/service requirement to procurement computer system -authorization of product/service requirement -quoting and tendering -order placement -delivery -receiving order -details to procurement computer system -effects to repair	Kim and Shunk (2004): -find sources -select suppliers -negotiation -contract -issue purchase order -follow up -receive order -use, maintain, dispose -post processing	Lysons and Farrington (2006): -purchasing requisition -request quotations -negotiation -purchase order -receive order -make payment

From the table 1 can be noticed that rather same themes are present in all procurement process definitions. That confirms the previous assumption that direct and indirect procurement has similar process. The variation of terminology used and how actions are grouped under a wider term can also be seen. It seems that the starting point for process is rather mutual but some process descriptions are not mentioning all the steps between the procurement decision and supplier evaluation, which seems to be agreed ending point for the process. The elements of procurement process have not been changed during the years, since the literature varies from 1996 to 2012 as it can be noted from the table 1.

Procurement process conclusions from the sources Burt and Pinkerton (1996), Sollish and Semanik (2012), and Lysons and Farrington (2006) point out the main themes regarding the actual procurement process from their wide guides to procurement professionals. These three

sources are introducing procurement process from direct procurement perspective. Instead, the procurement process by van der Valk and Rozemeijer (2009) is made for procuring services. This is another important factor to consider as services purchasing may have special features which require different knowledge in comparison to material and spare part purchases. The last two procurement processes by Le Sueur and Dale (1998) and Kim and Shunk (2004) focus on procurement process for indirect procurement. From this point of view is seen that even though the process has been designed for different type of purchases the same elements are involved. The elements may further emphasize detailed issues which are important for e.g. service purchases.

As a conclusion of the procurement processes from table 1 on page 37 an overall conclusion of the generic procurement process can be made. Firstly, the process should start with careful planning of what is required, is it made in-house or is it outsourced, and when spare part, material or service is needed. Secondly, the selection of supplier, contracting and approval should be made carefully but efficiently, while utilizing supply base to offer a tool for controlled sourcing and supplier management. Thirdly, the order follow-up and delivery are playing an important role from maintenance point of view, thus the communication between purchaser and requestor should be sufficient enough. After all these sub-processes, it is important that the whole process is documented since purchase request, that payment can be handled efficiently through purchase ledger.

Regarding to the conclusion of the generic procurement process, the procurement processes from table 1 on page 37 are utilized to select the main sub-processes of procurement process for the theoretical procurement process in this research. The aim of this constitution is to perform as an ideal model about efficient procurement process suggesting how procurement should be organized. It needs to be noticed that theoretical model introduces a whole process, but some sub-processes may not be necessary with regulatory purchases. Thus, it is needed to consider which sub-processes are required for each purchase.

The theoretical procurement process is described on Appendix I. It is constituted based on identified sub-processes of procurement process. Referring to an Appendix I, sub-processes included are rough categories of several actions performed under certain sub-process. The main idea is that into theoretical procurement process is affecting common processes and

information system utilization, and that strategies are aligned as aimed in global sourcing theory.

Next, the sub-processes, and more detailed actions and strategic perspectives will be introduced. This information is relevant to empirical analysis of maintenance procurement's current state.

3.3.1 Planning and identifying needs

Planning and identifying needs can be considered to be the starting point of procurement process. It has been defined as a first step by various sources (see table 1 on page 37). Planning and identifying needs can be simplified as deciding what materials and services to purchase. (Burt&Pinkerton, 1996, p. 24; Sollish&Semanik, 2012, p. 231) Therefore, procurement process should begin with careful analysis of planned tasks and identified needs.

Planning and identifying needs is possible to consider both as a strategic and as an operative decision. Most of the sources can be said to obtain the operative perspective, as identified and planned needs are creating the baseline for further purchasing decisions. Burt and Pinkerton (1996, p. 73) defined planning and identifying needs as a key factor relating to responsiveness of the firm from customer's perspective, meaning that e.g. timing of the purchases have major impact to successful operation. This perspective is especially relevant when maintenance procurement is aimed to be performed on customer's premises to ensure availability of machine for production. Regarding to availability, Le Sueur and Dale (1998) identified planning as part of procurement cycle as critical success factor, as with careful planning could be avoided non-availability of spare parts and maintaining excessive inventories, affecting directly to availability of the machine.

Referring to timing of purchases, the communication and information sharing between purchaser and inventory personnel need to be up-to-date regarding to inventory levels. That is one method to minimize the possibility of excessive inventories but yet have availability of materials or external services at the required level. Another perspective regarding to communication is to have a cross-functional teams including customer as a stakeholder, and

to avoid possible availability issues, needs analysis could be considered. Sollish and Semanik (2012, p. 287) are suggesting to perform needs analysis to conclude requirements and scope of the service (i.e. statement of work), and to evaluate operations' costs by function, required service levels and KPIs, and possible critical risks. Due to cross-functional teams, purchasing personnel can be kept informed and when final decisions are made, the discussion of requirements and supplier selection may begin. With this early involvement of purchasing personnel into planning and scheduling, as well as sourcing, enhances their capabilities to perform supplier selection, due to improved awareness of products' and services' needs and cost restraints, sourcing strategies and negotiating plans (Sollish&Semanik, 2012, p. 236).

One of the key issues to solve during planning and identifying needs is to perform strategic make-or-buy decision. With make-or-buy is meant the decision whether e.g. service is performed in-house or bought outside of the company. In maintenance service context, the service itself is outsourced, thus customer has performed make-or-buy decision. But when the agreement often involves managing materials and external services, make-or-buy analysis could be relevant also for service provider at the site. Regarding to that, decision can be performed by evaluating the availability of resources of site organization.

As stated before, planning and identification of needs should be ensured by cross-functional participation to the process, it means that purchasing personnel is not the only one responsible for this sub-process. Most of the input for the further procurement process, should be conducted by work planners and schedulers in cooperation with maintenance management.

3.3.2 Specify requirements and create request for quotation

Specifying requirements and creating a request for quotation are important tasks to ensure that both purchaser and supplier receive sufficient information of goods or services needed to purchase and deliver. The more specific requirements are the more possible it is to shorten procurement process. The shortening is possible by saving time when screening suitable suppliers. The more specific requirements ensure that purchasing personnel can easily

translate the requirements into order and possible contract even without high technical knowledge.

While in the first sub-process is identified the needs, here are aimed to provide purchasers with the sufficient list of specified requirements how to accomplish the needs, i.e. what are the technical specifications for the item needed or what is the specified service level towards the service needed, possibly with suggestions of screened suppliers. Specified requirements can be divided either to specification considering materials and items or scope of service (SOS), considering services. It is also recommended that purchase requisition is utilized to identify whether it has been purchased earlier or it is a new purchase by matching that to purchase records. (Burt&Pinkerton, 1996, p. 38; Sollish&Semani, 2012, p.2; Lysons&Farrington, 2006, p. 183) According to this identification should be decided whether request for quotations are required or can it be bought directly from the previously selected supplier. In cases of new buy, the procedure should be request for quotation, quotations, negotiation and then purchase order. (Lysons&Farrington, 2006, p. 183) Other sources emphasizes supplier selection in between of quotations and negotiations and purchase order.

Specifications and SOS can be utilized for communicating purchaser what to buy and potential suppliers, what is required, creating a base for purchase order (PO), and creating a baseline for measurements and quality inspections (Burt&Pinkerton, 1996, p. 40). In detailed, specifications should include technical description, e.g. reference to certain stock number of supplier or brand name (Sollish&Semani, 2012, p. 2). Instead, SOS can be stated in detailed and perspective format, including the information what is the service to be done, methods used to perform the service, how often the service has to be performed, and how the level of performance is measured i.e. key performance indicators (KPI) (Sollish&Semani, 2012, p. 3).

The types of specifications and scope of services vary between organizations. Specifications can typically have three different approaches: technical – physical characteristics of the item, functional – description of item's actual role and intention, or performance specification – defining KPIs of item's or service's actual performance. (Sollish&Semani, 2012, p. 28-29) In comparison, SOS informs what is required from the service and should include following

aspects: description of performed work, timeline of tasks included to work, KPIs for quality and performance, and contractual terms and conditions (Sollish&Semanik, 2012, p. 31-32).

After identifying need and informing clear specification, approved purchasing requisition before proceeding to request for quotations and bidding is required. Purchasing requisitions include the information such as description of need, type of the product or service, specifications or SOS, and cost evaluation. It is possible to submit them as a paper form but nowadays, they are suggested to be processed through information system, thus approvals for purchase requisition can be processed according to same workflow in that system (Kim&Shunk, 2004; Sollish&Semanik, 2012, p. 8). Until this sub-process, procurement process is most often handled by engineers on sites according to Le Sueur and Dale (1998). They identified as a problem that engineers are requesting suppliers without authority and probably not entering all necessary details to information systems causing double work further on. They also found out that still the most often buyer is the one seeking quotes and tenders as required, but it may be time consuming.

Sending request for quotation (RFQ) to the suppliers is considered as solicitation of bids i.e. tendering to receive quotations to compare in supplier selection. Basically, solicitation of bids can be considered to be either request for proposal (RFP) or request for quotation. The difference between these two documents is that whether specification or SOS have been included into quotation. In an ideal case, specification or SOS has been created before soliciting bids from potential suppliers, thus RFQ is the one that should be utilized during procurement process. The purpose of RFQ is to reach suppliers' price and contractual terms and conditions, including the buyer's objectives towards to possible future contract. (Sollish&Semanik, 2012, p. 41-45)

Regarding to purchasing of services, van der Valk and Rozemeijer (2009) consider that most of the value for further success is determined during these first steps of the process. They emphasize that in service specifications, i.e. SOS, should be identified relevant stakeholders and determined their degree and method of involvement to the service purchased, since it may effect to identification of individual's objectives. They also emphasized the same issue that specification must be complete and accurate, but instead of continuing with RFQ they suggest to utilize request for information (RFI) to collect information from suppliers. That

collected information is often utilized for interacting with suppliers and developing detailed specification.

3.3.3 Supplier selection

Supplier selection is perhaps the most important sub-process during procurement process, which has a significant importance to the end product. The previously defined requirements are underlying this selection and limiting the amount of suppliers for comparison. Along with clearly defined and communicated requirements the clear and set criteria are needed for selection.

Supplier selection should start from establishing selection criteria to ensure that the right supplier would be selected. If this baseline of supplier selection is not processed well, in some cases the result may be poor and unsatisfied output of supplier's performance. During the selection of the offer and supplier, the key criteria applied should be as objective as possible, and employ proper due diligence. (Sollish&Semanik, 2012, pp.69-70) Lysons and Farrington (2006, p. 183) consider supplier selection to be an automatic part of process when quotations and negotiations have been processed.

The most suggested solution for supplier selection in long term projects, is to create a supplier base. Supplier base is used to manage the extensive amount of supplier data received during supplier selection. Supplier base can be considered as a list of suppliers, which are categorized e.g. according to the supplier's status, and contract database, thus it can be considered as a database including all supplier related information that is managed through electronic tools. The aim of the supplier base is to offer current status and historical data of suppliers for internal personnel (Sollish&Semanik, 2012, p. 46). One of the main benefits of supplier base is to have all potential suppliers recorded, and therefore save time during the screening of potential suppliers for selection.

One option for constituting supplier base is according to suppliers' status. But there are several methods how to categorize supplier base. Those methods are as following:

- approved supplier list (ASL) – suppliers who meet the criteria and are qualified to deliver e.g. certain materials or services;

- certified suppliers – suppliers who integrate quality standards and systems of several companies with minimum costs for inspection and training;
- qualified suppliers – suppliers who has participated the selection process but may not be qualified enough to approved supplier list;
- preferred suppliers – suppliers having capabilities that are valuable for buying company, and often offer exceptional service or compatible pricing;
- disqualified suppliers – suppliers that do not meet the buyer company’s requirements for one reason or another. (Sollish&Semanik, 2012, p. 46-47)

Burt and Pinkerton (1996, p. 107) identified nine problems regarding to selection of suppliers. The problems are: 1) short timeframe for seeking and negotiating with suppliers, 2) requirements towards suppliers, 3) lack of attention to seeking potential suppliers, 4) repetition of purchase from current but marginal suppliers, 5) insufficient utilization of global sources, 6) purchasing from suppliers contacting buyer, 7) not utilizing competitive bidding during the process, 8) users purchasing through “back door”, and 9) placing orders without proper screening and selection. These problems relate to both process management and capability of employees, whilst they give an insight for process constitution in order to avoid certain problems in the future.

Regarding to services van der Valk and Rozemeijer (2009) suggest that when proper specification is determined, company should move to supplier selection. They emphasize the significance of clear specifications and that RFQs are necessary. These are considered important as the service is produced and consumed in interaction of buyer and supplier, and coordination for working together in service delivery must be agreed. Therefore, “a selection decision can be made, not only for the best alternatives in terms of service specification, but also for the best alternative in terms of ongoing buyer-supplier interaction” (van der Valk and Rozemeijer, 2009).

Supplier selection is considered as an important part of the procurement process, whilst it has long term effects to buyer’s performance and costs. Therefore, thorough selection according to selection criteria have to be performed. Supplier selection is as important for both materials and services bought, even though for service providers there is higher emphasis on clear specifications.

3.3.4 Approval or contract

By approving or contracting is meant the following sub-process after suitable supplier has been selected and purchasing order is started to prepare. Basically the idea is that if the purchase is made from a known supplier, only the approval of the suitable person who has the right to approve purchases is needed before sending the order. In those cases, when a new supplier is required, there is perhaps required a contract, that needs to be created and further approved by selected person, often from the management. Approving or contracting relates strongly to roles and responsibilities of organization.

When defining organization's roles and responsibilities the right for approving purchases has to be decided. Sollish and Semanik (2012, p. 7) suggested to have an individual authorized to approve requests for purchases in each department according to hierarchical authority. With hierarchical authority is meant that an individual can approve more expensive purchases when being in a higher position on chain of command. Instead, Kim and Shunk (2004) referred that only when supplier is new or from off-contracted sources, purchase requisition should continue to approval according to approval rights, which should be according to cost-center limits.

Managing contracts is one of the main operative tasks during procurement process. Contracts are affecting both to legal and financial obligations of a company, and may also have effects to outcome of the operation (Sollish&Semanik, 2012, p. 89). With contract management is referred to supervising that terms and conditions are performed by each party as agreed. Contract management is in a key role again when spoken about service purchase. Regarding to these contracts, it is often referred to service level agreement (SLA) i.e. scope of service. This is relevant to communicate what is exactly expected from supplier, and what are the responsibilities for each parts both from buyer and supplier sides. (van der Valk&Rozemeijer, 2009)

Therefore, approval is essential operative issue, that selected roles have to perform as often as needed. As procurement process may have even significant effects to costs of the performance, approval of purchase requisitions and suppliers have tight connection to cost controlling. Thus, the purchase and contract management should be ensured to maintain the required cost level.

3.3.5 Purchasing order creation and order follow-up

Purchasing order creation is the following step after suitable supplier has been selected and approved. It is rather fast step, and is considered to be routine day-to-day work of purchaser. In order to do it successfully, the purchaser must ensure due diligence in order to achieve benefits for internal users.

The successful handling of POs is depending on purchaser's involvement into the first sub-processes of procurement process, and being familiar with complete and specific requirements and contracts. (Sollish&Semanik, 2012, p. 174) The same was noticed by Le Sueur and Dale (1998) who mentioned that due to a lack of buyer's technical skills there might be misunderstanding when translating technical terms to purchase order, that may generate delays. Informing other departments of the business was another relevant task identified by Lysons and Farrington (2006, p. 183). Regarding to maintenance environment it would be more relevant to inform requestor and other parties involved to receiving delivery further on etc. It is also noted that acknowledgement of order should be provided by supplier to confirm the acceptance of order's terms and conditions and that order is to be processed.

After creating the purchase order, the second issue is to follow the order processing. Successful follow-up is most often dependent on the supplier relationship or electronic information sharing. Electronic information sharing is mostly considering tracking and monitoring order or shipment with the help of automated tracking tools (Sollish&Semanik, 2012, p. 179). Also Kim and Shunk (2004) have been focusing on information systems utilization for automatic purchase orders and order follow-up. In those cases, purchase orders could be sent through connected systems or directly to suppliers' webpages. This linkage ensure that buyer can monitor the order's status through their own system, and track and receive notifications of the order until they receive an invoice from supplier.

Order follow-up is more visible sub-process to perform for item purchases, than compared to service purchases. Van der Valk and Rozemeijer (2009) consider that when there is a service contract with a supplier, all orders during contract period should be monitored and controlled. Monitoring and controlling are aimed to perform according to contract terms and KPIs agreed on contract relating to continuous supplier evaluation.

As the acceptance and confirmation of order is assumed to receive from the supplier, also advice note when order has been dispatched or is ready to collect should be received from the supplier. This information is crucial for order follow-up, as buyer has possibility to react to possible delays of orders in a form of expediting. Expediting is required in cases when delivery dates need to be met or delivery of order is overdue. (Lysons&Farrington, 2006, p. 184; Sollish&Semanik, 2012, p. 179)

Purchase order and order follow-up is more or less informative sub-process, meaning the information is changed between parties involved. Basically, when more information is shared, the process is more controlled. The information about order status is relevant for requestor in order to plan and perform their work, while in addition giving more insights about supplier's performance.

3.3.6 Receive order

Receiving the orders delivered by suppliers can be considered dependent on the type of purchase, whether it is items or services. Basically, the actual receipt of order is possible only for items or materials purchased. Receiving order is one of the main aspects in order to ensure that the requestor receives the order at the right time and at the right place when order is delivered to the site.

Person responsible for receiving order is important to agree in order to ensure effective process flow. Lysons and Farrington (2006, p. 184) recommend that inventory personnel is responsible to receive order and checking whether the quantity match to the order. Another perspective is offered by Le Sueur and Dale (1998) suggesting that receiving order is the responsibility of the engineer placing the original purchase requisition. Regarding to responsibilities, Le Sueur and Dale (1998) identified issues, that most probably may occur if the person placing purchase requisition is not available for receiving: 1) service performance may delay whilst the person may be the only one knowing into which operation the order is aimed to be placed; 2) if another person perform receiving, error may happen if order is not checked correctly, and discrepancies are possibly reported to supplier rather late after the acceptance of order; and 3) if receipt would not be entered to information system properly, there may occur an inaccuracy between invoice and information in the system.

In addition to defining responsibilities, acceptance of delivered order must be agreed. If the receiving person finds out any matter regarding to quality or specification, so the order is not satisfactory, person should inform purchasing personnel in order to make e.g. complaint or reclamation. Instead, if order can be accepted as it is delivered, this must be marked with received note, and deliver copies to purchasing personnel for further processing. That means that purchasing personnel is responsible to inspect the order and accept or reject them regarding to terms of contract. (Lysons&Farrington, 2006, p. 184; Sollish&Semanik, 2012, p. 186) The acceptance of order is important as when order had accepted either by word or e.g. actual usage, the order cannot be subsequently rejected anymore. It also needs to be noticed that if the received order is rejected, supplier has right to remedy, e.g. rework or replacement within a reasonable time frame and their own cost. If this is a case, buyer organization has a duty to help e.g. by migrating loss in a way of using order partly or accepting downgraded price for partial order. (Sollish&Semanik, 2012, p. 186-187)

Therefore, in order to ensure effective and correct order receiving, responsibilities and acceptance criteria and procedure must be defined. This includes, that each order must be received and accepted correctly and information need to be entered onto information system to ensure proper information for purchasing personnel for further processing.

3.3.7 Make payment

Completion of payment is related to managing information flow of the procurement process. Nowadays, payments are managed through purchase ledger in information system. Information systems ensure connecting procurement, and invoicing and payment related information together. Thus, the successful management of the previous sun-processes are crucial to be recorded into information systems correctly.

In the simplest form, payment is processed after supplier has delivered the invoice according to the order. Received invoice should always be compared to original purchase order and order receipt information. The comparison and price checking is usually the responsibility of purchasing personnel, and it is advised to pay special attention to possible differences to quoted price. After this comparison, if invoice is according to order, purchasing personnel

will deliver invoice information to accounting for payment. (Lysons&Farrington, 2006, p. 184)

Sollish and Semanik (2012, p. 185) suggested to consider payment from another perspective as well. They suggest that payment is directly correlating with supplier relationships, meaning those will be maintained good when payment has been made on time. They also emphasize that if any differences have been found from the invoice, all actual payments should be made according to actual proofs, e.g. receipt of order or achievement of specific milestone. Another issue recognized by them is the rework that generates if invoices are inaccurate or incomplete, or if invoice and purchase order do not match. Those invoices that do not match with purchase orders, are suggested to be recorded to exception report for further checking. Other invoices will be matched automatically and later on paid automatically through current information systems. This is possible nowadays, due to operational information systems are integrated with back-office purchase ledger (Kim&Shunk, 2004).

Therefore, the main point of payment phase is to ensure that all employees are committed to utilize information systems as needed. This ensure higher rate of automatically connected invoices and purchase orders while shortening the amount of rework. Thus, shortening the time frame of procurement process.

3.3.8 Supplier evaluation

In a long term project, it can be assumed that procurement process does not end to order delivery and usage. Instead, procurement process includes the continuous evaluation of the suppliers' performance. Therefore, supplier evaluation should not be considered as a separate phase of the process but to be included throughout the process. This can be noticed from the comparison of procurement process, in which only Sollish and Semanik (2012), and van der Valk and Rozemeijer (2009) have separated evaluation to its own phase. In other literature supplier evaluation was emphasized e.g. in specification and contract management phases.

The performance evaluation is important especially, when services are purchased. A continuous evaluation of suppliers provides more specific information of their performance and thus may reflect to further supplier selections or supplier development actions. Supplier evaluation consists of monitoring and reviewing supplier's performance, and developing performance improvements. In order to perform the evaluation, certain performance levels and KPIs are agreed and included into contract terms. (Sollish&Semanik, 2012, p. 249-251) It confirms that, supplier evaluation regarding to e.g. purchased services should also be taken into consideration when specifying requirements and making a contract.

Regarding to van der Valk and Rozemeijer (2009), one issue separating purchasing of goods and services is that, services are harder to evaluate before purchasing and thus, complicates the supplier selection. The previous steps performed in this process are aimed to provide both buyer and supplier with the KPI's that are expected and further on measured as agreed to evaluate the performance of the service. This is important to see whether service performed is what it was expected to be and according to a contract, which may further affect to the final payment, and for reselection of supplier. (van der Valk&Rozemeijer, 2009) Thus, the continuous supplier evaluation during the procurement process is essential.

4 DESIGNING OF MAINTENANCE PROCUREMENT MODEL

In this part is aimed to focus on introducing case company, current state of procurement at mill maintenance sites, and designing maintenance procurement model. The main objective is to analyze gathered empirical data by comparing it to theory introduced. As a result of the analyses certain challenges and problems in procurement can be identified. That will further lead to designing improved maintenance procurement model.

4.1 Case company

The case company, Valmet Technologies Oy, is part of global Valmet Inc. corporation. Valmet was demerged from Metso Group back to its own company in 2013. Valmet is “the leading global developer and supplier of process technologies, automation and services for the pulp, paper and energy industries.” (Valmet, 2016a) Valmet has a long industrial history recorded back in 200 years. Today’s Valmet has been built as a result of several merger and acquisitions over those 200 years of its history. (Valmet, 2016a) The effects of its long history of merger and acquisitions can be seen in different working habits of business units.

Nowadays, Valmet has net sales approximately 2.9 EUR billion in 2015 and over 12,000 employees working globally. While comparing to year 2014 Valmet gained increase of 18 percent in net sales. (Valmet, 2016b) Valmet constitutes of four business lines: pulp and energy, paper, services, and automation. It operates on five geographical areas, which are North America, South America, EMEA (Europe, Russia, Middle East and Africa), China and Asia-Pacific.

Valmet’s vision “To become the global champion in serving our customers” (Valmet, 2016c), is supported with clear mission, strategy and must wins. Must wins are certain topics supporting performance according to strategy. The must wins are customer excellence, leader in technology and innovation, excellence in process, and winning team. These must wins are aimed to be present in daily performance of each employee in a way they work and emphasize the topics to consider when working. Sustainability is having a great role in

Valmet's mission and strategy while being strongly present in development too. The result of sustainability actions can be seen when Valmet was selected for three years in a row to Dow Jones Sustainability Indices in September 2016 (Kauppalehti, 2016).

This thesis has been produced under Services business line. Services business line accounted together with automation business line 46% of the net sales in 2015. In previous year 2014 services business line accounted 40% of net sales, thus it remained stable. (Valmet, 2016b)

4.2 Research process

The research process presented on figure 7 below, is based on theory guided analysis. Therefore, the theoretical framework and previous data of the topics are guiding the selection of analyzed themes. Later on the analyzed themes will be compared and combined to theory in order to find the connection and new solutions. (Tuomi & Sarajärvi, 2009, pp. 96-97). This will support drawing a generalization of the topic, which is one advantage of the qualitative case study by Metsämuuronen (2006).

Theory		Empiricism	
(1) Integrating and coordinating global sourcing (2) Organizing procurement process	Theory defines processes to observe, documents to analyze, and themes for interviews	Current situation	
		Documents Interviews Observance	
		Analysis by comparing to theory	
Maintenance procurement model			
Recommendations and conclusions			

Figure 7. Constitution of research process

Research process began by identifying critical elements for organizing procurement process from the literature, and to see how does the nature of business affects to process. By drawing up the theoretical process was identified the themes and typologies of content for further empirical research. Thus, theory defined the interview themes, processes to observe and documents to analyze. After this was continued to theory of integrating and coordinating global sourcing to identify how does that effect as an element to organizing procurement process. Similar to first theme, from global sourcing literature was identified the themes that need to be analyzed during the empirical part.

Based on the findings of theoretical part is analyzed the content of empirical data collected in order to constitute the output of the research, the maintenance procurement model. Beside of designing the maintenance procurement model, the success factors that, affect to performing global maintenance procurement process, are discovered. In the end, there will be provided recommendations for further actions and conclusions.

4.2.1 Research method

As the research is qualitative in nature, there is not performed quantitative data analysis. Research methods utilized in qualitative research are: observation, content analysis, interview and transcription (Metsämuuronen, 2006, p.89). For the data analysis will be utilized a content analysis. The content analysis can be considered as a method including a loose theoretical framework connecting that to different analyses. (Tuomi & Sarajärvi, 2009, p. 91)

In order to perform the content analysis, the collected data need to be processed in a way that supports the utilization of data. In this research a typology of content is needed when a purpose is to find similarities of the data. By typology of content is aimed to group the content to certain types and, e.g. search similarities within certain themes and construct of those similar points an overview, such as a paradigm. (Tuomi & Sarajärvi, 2009, p. 93; Metsämuuronen, 2006, pp. 124-125). The paradigm constructed will act as a maintenance procurement model, which can be further implemented to selected mill maintenance pilot site.

The typology of the content for procurement process analysis will be performed according to the sub-processes introduced in theoretical part. There will be searched similarities and differences of performing sub-processes at sites. From identified similarities and differences is possible to identify the ideal way of performance when comparing the results to theory. In order to analyze global sourcing, the typology of content is referring to theoretical frameworks of global sourcing models. In that case the theoretical models are utilized to identify the current state and the possible target state. In the end, procurement process and global sourcing analyses are combined into paradigm resulting to maintenance procurement model and its success factors.

4.2.2 Data collection

In qualitative researches the most utilized data collection methods are interview, questionnaire, observation and documents. It is possible to utilize only one of them or use them together based on the researched problems and resources. One basic rule is that the more formal and structured research design is, the more tested methods and structured questionnaires are required. (Tuomi & Sarajärvi, 2009, p.71)

In this research will be utilized interviews, observation and case company's internal documentation in order to study the current maintenance procurement performance and possibilities to design the maintenance procurement model and enable intra-organizational cooperation. Interviews are theme-interviews consisting of structured questions defining the themes to be discussed and guiding open discussion. By theme-interviews are emphasized people's perceptions of subjects, the meaning of the subjects and interactions between the subjects. (Tuomi & Sarajärvi, 2009, p. 75.) In order to create a comprehensive view, observation is utilized. Observation will be participatory in nature, whilst researcher is in close interaction with researched subjects (Lapan, Quartaroli & Riemer, 2011, p.93).

The sites selected for this research will be named from A to C, to protect the anonymousness of results. Those cases are introduced in table 2 on page 55. These cases are further analyzed and based on to the analysis maintenance procurement model will be designed. The selected cases were aimed to be from at least two different continents in order to research the

differences of procurement process under different area management, and be able to apply the further model in a global scale.

4.3 Maintenance procurement currently

Maintenance procurement has been under discussion for a long time with a perspective that there is limited procurement knowhow at the sites. This have been noted by some customers as well because generally, in a maintenance outsourcing cases, the customer is often willing to outsource also inventory management, sourcing and supplier selection to the service provider. Therefore, it is essential that the service provider has an efficient process and capability to certain activities along with management of procurement process for purchases made on service provider's account. Despite of this, the case company has procurement organizations in areas, which support would be beneficial to maintenance sites.

Currently, it can be seen that the maintenance sites have a need for improvements to achieve better coordinated and controlled procurement process, as it was assumed before this research. This assumption was supported by results of case study interviews and observations. In two out of three cases it was admitted that the site has a somewhat unclear procurement process, as shown in table 2. Before this research, one cause for unclear process was considered to be different scopes of agreement. It was noticed, that even though the scope of agreement differs in all three cases, the same challenges regarding to procurement can be seen. The selected cases are introduced before sharing the conclusion of the current state of maintenance procurement. On a table 2 below can be seen the most relevant factors to describe the cases.

Table 2. Introduction of cases

	Case A	Case B	Case C
Procurement responsibilities on case company's account	Purchasing external services and limited amount of materials	Purchasing limited materials required for own employees	Purchasing external services and materials required for own employees
Utilization of case company's ERP	Yes, but partly insufficient	No	Yes, but partly insufficient
Purchaser on case company's site organization	Yes	No	No

Site's perception of current procurement process	Unclear process	Process works	Unclear process, but it is under re-organization
Cooperation with area procurement	Issues related to contracts	No cooperation	No cooperation, but willingness to
Main issues in current procurement process	Lack of cooperative planning and information sharing, and control of purchases	Insufficient utilization of information systems	Lack of cooperative planning and information sharing, and control of purchases

Overall, the challenges of the cases remain to be around certain topics: planning and coordinating, communication and information sharing, and utilizing ERP systems. These challenges are not all related to specific sub-processes in procurement process, but are more or less occurring in daily work. Planning and coordinating, and utilization of ERP systems are tightly connected to each other's. Thus, communication and information sharing supports successful process. Therefore, it can be said that all main issues are tightly connected and affecting a whole procurement process.

Development towards to better planned and coordinated procurement could be considered to be one of the main issues. In two out of three cases there was limited control or analysis of the purchases or supplier base. In all cases each maintenance site team member can make purchase request' amount but in those two cases it is most often turned to purchase order without any further analysis. In addition, limited planning and coordinating procurement can be seen from amount of emergency purchases and express deliveries required. If procurement would have been considered more thoroughly during planning maintenance works and shutdowns it could be assumed that amount of emergency purchases and express deliveries could be decreased. Better planning and coordinating could possibly enhance the knowledge about purchase levels and consuming.

In most cases professional procurement knowhow on service provider's own organization is limited. There is a policy, that each employee should be able to do purchase requests. Even though each employee can make a purchase request, those are not always automatized or standardized. Therefore, if the request goes either to a person responsible of creating purchase orders for service provider's account or to customer's purchaser, it cannot be guaranteed that the request includes all necessary information. This is a concern, especially if that person does not have enough technical knowledge. Along with the purchase request,

the requestor informs the supplier that has been selected, and most often it is the same, from whom it was ordered the last time. There is neither fully utilized own supplier bases nor service provider's supplier base.

Secondly, communication and information sharing remain as an issue both within maintenance site team, and between maintenance site, customer, and area. In two out of the three cases it was noticed that communication channel between maintenance planners or schedulers and procurement was not clearly visible. Also from same cases it was pointed out that communication between maintenance site team and customer procurement regarding to sourcing and supplier selection is sometimes lacking established channel and systematic manner.

Regarding to cooperation between maintenance site procurement and area procurement, it was found out that only in one of the three cases maintenance site procurement is well supported by area procurement. Nevertheless, another case of selected ones is looking forward to closer cooperation and increased support from area procurement. Therefore, maintenance procurement is currently rather separate of areas' procurement and relying heavily to local suppliers. A common problem regarding to site's and area's cooperation was noticed to be that from both sides they are not sure who the persons to contact are. Another issue from the view of area procurement is the difficulty to understand maintenance case's scope and lack of guidelines how to work with maintenance sites. Whilst designing a successful maintenance procurement model, it would be needed to find a way how these channels should cooperate in order to maximize procurement efficiency at site.

4.4 Analysis

As the aim of the research is to design a new model and identify success factors to perform it, a general procurement process and potential solutions to organize it with strategic global sourcing element are targeted to research. Therefore, in this research is utilized qualitative analysis, which is applicable to research generalized solutions. Firstly, because majority of the cases indicated that there is unclear process for procurement seen at site, the sub-process analysis can be utilized to identify what information and when should that be shared, and who is responsible to share that. The result of such analysis would ensure more efficient

process to the sites further leading to benefits, e.g. cost savings and improved availability. Other major issue identified from cases were the lack of sites' procurement alignment to company's procurement procedures, and utilizing mainly local suppliers. Further these issues and potential solutions for improvements indicate to the utilization of global sourcing. Therefore, qualitative analysis also supports researching the most suitable framework of global sourcing to integrate it to the developed procurement process.

In global sourcing analysis is focused on searching the potential model to support its integration to maintenance procurement process. First of all, the ideal model for global sourcing is defined according to company's procurement function and maintenance sites' procurement organization. After that suitable strategic alignment form is analyzed to support the utilization and implementation of global sourcing model into procurement process. Success factors are further analyzed to see what are the current qualifications to such integration.

In procurement process analysis the main focus is on responsibilities and information sharing in an efficient way. If the process can be managed in an efficient way it could be possible to save resources and time consumed for the process, thus leading to possibility to focus on the core tasks of service provider. From the above mentioned issues can be drawn a conclusion that a clear and managed process is essential to improve sites' performance.

Next there will be analyzed global sourcing and procurement process of the cases. Certain recommendations to further consideration for case company are presented when the analysis have been conducted. It is believed that if the recommendations introduced in this thesis are used to implement the model e.g. for a pilot case, there is possibilities to achieve effective and cost efficient procurement process while increasing the availability of the machine benefitting both service provider and customer.

4.4.1 Global sourcing analysis

While in procurement process analysis will be analyzed the current processes by comparing it to theory, global sourcing analysis will have a slightly different perspective. As there is no

strategic alignment or global sourcing involved currently, the analysis is used to identify the potential solutions for further maintenance procurement model.

In theory was introduced three central elements of global sourcing, which are degree of centralization, coordination, and standardization. During the empirical data gathering it was found out that in order to increase both levels of professional procurement knowhow and global sourcing in maintenance sites, there should be alignment in strategies and closer cooperation to area managed procurement. Therefore, in order to decide the optimal model for global sourcing and search its effects to procurement process is required to consider the elements also in a company level. General conclusion of global sourcing elements is introduced in a table 3 below.

Table 3. Global sourcing within a company and business

Element	Company level	Maintenance business level
Degree of centralization	Decentralized areas in which centralized procurement, i.e. a hybrid	Decentralized to globally dispersed sites
Coordination	Development actions towards to increased coordination	No coordination
Standardization	Development actions towards to increased standardization	No standardization

Currently the company's degree of centralization regarding to procurement and global sourcing is hybrid as seen in a table 3. Each area has centralized their procurement or are aiming to centralize it but still in a global scale areas are operating decentralized. Instead, the current degree of centralization within maintenance sites' procurement is fully decentralized. Especially within EMEA area, where is several maintenance sites, could be a possibility to achieve benefits if the sites' procurement process is included to centralized area procurement. By this way, the global sourcing element could be introduced to sites' procurement process.

Coordination and standardization, instead are considered to be under development to improve them both from global and area perspective, but neither coordination nor standardization in maintenance sites' procurement are not seen. Coordination within area's

procurement can be considered to be more about strategic sourcing and decision making, but the operative sourcing and decision making is still made locally or within business units. Despite of that there are aims and development actions made towards to more coordinated supplier management, both within areas and from the global company level. According to Quintens et al.'s (2006a) definition of process and person standardization, standardization can be considered to be under development within a company. As seen in a table 3, maintenance sites' lack coordination and standardization in procurement. Those could be improved with the developed maintenance procurement model.

As mentioned already when described the current state of maintenance procurement at sites, there is limited cooperation with area managed procurement function. Further two of the three sites emphasized the willingness to cooperate more with area procurement. Also in all cases were emphasized the importance and utilization of local suppliers. Therefore, at the moment there is barely no global sourcing utilized in procurement at sites. In order to analyze the possibilities and future target state there will be utilized the global sourcing model by Arnold (1999). In a model there is considered business and company level global sourcing structures separately, and those are utilized to find the suitable target state.

The internationalization of maintenance business remains high as the sites are located in the following areas: North America, South America, EMEA, and Asia Pacific. Despite of that internationalization of procurement is low. This means that regarding to internationalization, the business is considered as global sourcing deficit. Instead, regarding to the current state of centralization, the business is considered to have atomized structure. This is due to the matrix organization leading to that all sites are under dispersed area management in general, and therefore the procurement is also decentralized. When combining the status of internationalization, global sourcing deficit, and the status of centralization, atomized structure, into the same matrix, the current state of global sourcing can be described. The current state is described on figure 8 on next page.

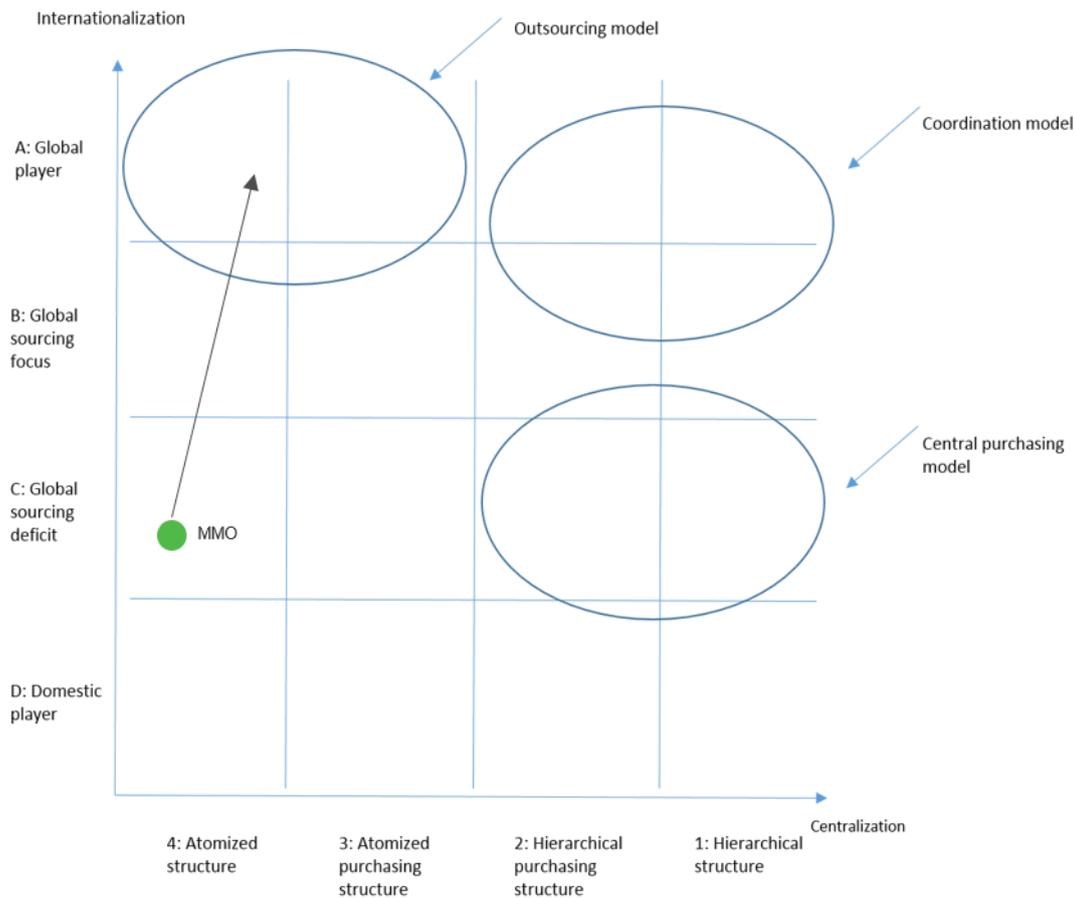


Figure 8. Current and future target states of maintenance procurement according to model of Arnold (1999)

As seen on figure 8 above, the current state of global sourcing in maintenance business is remaining low, meaning that it is currently mainly domestic sourcing but there is interest towards to internationalization. Referring to Trent and Monczka's (2002) global sourcing levels, the business is currently on global sourcing level II. Meaning that whilst having local and domestic sourcing, there is also interest towards to internationalized sourcing and global sourcing actions.

The most relevant factor affecting to the degree of centralization and thus, to potential future state of global sourcing, is the organizational structure of the company. When taking the organizational structure of the company into consideration, the most potential future target state according to Arnold's (1999) models would be outsourcing model and towards to Trent and Monczka's (2002) global sourcing level III. With the outsourcing model is possible to coordinate and pool purchases of sites and business units within same area, while outsourcing the sites' procurement responsibility mainly to area managed procurement

function. By this model it is possible to add the element of global sourcing through companywide procurement strategies and processes into sites' procurement, and increase the level of professional procurement knowhow in maintenance sites. Enabling global sourcing utilization in maintenance sites' procurement process through outsourcing model is supported by Brandmeier and Rupp's (2010) research and identified dependencies showed in figure 5 on page 32.

Other models by Arnold (1999) are more difficult to achieve due to the current organizational structure of the company. In case the case company would move towards to more centralized management, the coordination model is possible in a long run. Instead, central purchasing model, at least on its full potential would not possibly be applied even with high rate of centralization. But it has to be noticed, that there are improvement actions towards to partial application of central purchasing model, as there is aimed to cooperate with contract and supplier management issues in the future.

Strategic alignment

By taking the actions towards increased centralization and coordination with strategic alignment it is possible to achieve the future target state of global sourcing. By applying strategic alignment through maintenance procurement model could be ensured common practices and operations of case company also to maintenance sites' procurement process. According to Day and Lichtenstein (2006) purchasing integration involves purchasing plans, policies and actions throughout the company. Therefore, strategic alignment regarding to purchasing integration is necessary to perform the maintenance procurement model. The implementation of strategic alignment could provide benefits to sourcing and supplier management for maintenance sites' procurement process. The benefits could be e.g. utilization of company's supply base, increased negotiation power, defined KPIs for suppliers, and therefore reduced procurement costs.

Strategic alignment is possible to apply in different forms according to Rozemeijer (2000), thus the most efficient form of strategic alignment for maintenance procurement model is essential to select. The most potential forms would be pooled negotiation power, sharing intangible resources, or shared tangible resources. There are actually two strategic alignment forms, that could be applicable for maintenance sites. Pooled negotiation power and shared tangible resources would support organizing procurement process with global sourcing

element. These forms are offering solutions and benefits for maintenance sites' procurement and area procurement cooperation.

Instead, sharing intangible resources would be useful to support and improve maintenance sites' overall performance. By sharing intangible resources, maintenance sites could share their information and knowledge regarding to processes and improving performance within same area or globally. This could possibly increase the market position of maintenance business among its competitors by reaching more references, and thus enhancing business' ability to sell the service to new sites.

Vertical integration would possibly be considered if there were two sites within a same country, and e.g. certain support service supplier could be utilized for similar tasks at both sites. Vertical integration between two sites located within same area could also possibly be considered if suitable suppliers are identified. Therefore, the next step after implementing pooled negotiation power and sharing tangible resources could be towards to vertical integration, in which the materials or services available within certain area are coordinated between maintenance sites on the area.

Success factors

Along with selected strategic alignment form, success factors are important to consider for further development ensuring practical implementation of maintenance procurement model, as this research provides only theoretical framework. Success factors' importance is also increased due to that procurement and global sourcing at maintenance sites is rather separate from case company's performance. Due to that, developed global maintenance procurement model is aimed to integrate sites' procurement process into areas' procurement organization in order to add global sourcing element. Success factors are analyzed more in detailed below:

- management commitment: throughout the process there has been several participants who has managerial position in procurement or maintenance. Those participants have been committed and willing to prepare changes to operations towards to improved performance. Despite of that, the executive management commitment is not yet seen. Regarding to further operations, commitment and support of executive management should be ensured.

- well-defined processes: currently there is rather unclear process at sites and no defined relationship or information sharing practices with area procurement, despite of the one case. In that case it is clear that area procurement is helping the site with contract managerial issues for both local and global suppliers. Trent&Monczka (2002) emphasized continuous improvement, management, review and re-establishment of contracts, and coordinating and developing global strategies in cross-functional teams. In order to ensure these issues mentioned by Trent and Monczka (2002), the maintenance procurement model could provide the answer.
- availability of resources: according to resources' availability by Trent (2007) there are currently limited professional resources at maintenance sites to perform procurement, especially regarding to global sourcing element. In order to ensure the global sourcing in maintenance procurement model, the purchaser and whole area procurement should be open-minded towards to global sourcing activities and have strong professional skills and knowledge.
- information technology: the role of information technology for operation management is high in current business environment, and it can be considered to be the most efficient tool to ensure global sourcing operations between globally dispersed units in MNCs. At the moment utilization of information technology for procurement process purposes remains rather low at sites but it is partly related to maintenance contract scopes.
- organizational design: regarding to current organizational design, the company level procurement organization have purposes to move towards to cross-functional and cross-locational teams according to theory of Trent and Monczka (2002). Cross-functional teams could also be considered successful in actual procurement process for the first sub-processes despite of utilization of local/domestic sourcing or global sourcing.
- communication: for current state of communication at maintenance sites, both towards to customer and area procurement, is room for improvement. There is insufficient communication regarding to purchasing needs according to some interviews. Once again Trent and Monczka (2002) emphasized cross-functional teams, and it is taken into consideration in a developed model.
- measuring savings: currently in maintenance sites the savings' measurement is nearly missing, and costs of purchases may not always be known in a detailed

manner. Also, suppliers' performance is not sufficiently measured. Therefore, measuring savings is lacking even before utilizing global sourcing. Instead, there are certain KPIs set from company level procurement, and each supplier must be evaluated and savings are measured continuously. Therefore, the connection to area procurement through strategic alignment would provide solutions to improve measurement issues.

As it can be seen from the analysis, global sourcing is currently not utilized. Therefore, these are certainly the issues for improvement. Because of this reason, the maintenance procurement model describes identified future state which could be reached with the help of strategic alignment.

4.4.2 Procurement process analysis

From case sites' current procurement processes were easy to notice that there are requisites and elements for successful procurement but yet those are not performed or managed in efficient way. In some case the current system was told to be working sufficiently for their needs and developments are not required or necessary. Instead in two other cases the improvement points were recognized and there also were willingness to improve the process. Next, procurement process analysis will be conducted according to identified sub-processes.

Planning and identifying needs

Planning and identifying needs are considered rather separate functions on case sites, whilst the importance of coordination of these two functions were understood and admitted to be crucial. Currently, the main procedure is that work planners and schedulers create the work plan into the information system, and when engineer is about to do a certain work, the needs for purchases are identified. After maintenance engineer identifies the need, they should create purchase request and suitable supplier/s for further processing.

When the needs are identified, sometimes even at the time when work should be performed, there is a high risk that work will be delayed due to that certain material or service is not available that time. This instead, leads to increased amount of unplanned purchases or purchases with increased costs. If these unplanned purchases could be avoided with the help

of proactive planning and thus cooperation between planning and purchasing personnel, some cost savings could be achieved. In addition to cost perspective, this has effects both to availability and responsiveness from customer's perspective, and possibly harm buyer-supplier relationship on site in a long run (Burt&Pinkerton, 1996, p. 73; Le Suer&Dale, 1998).

Make or buy-decision has been considered as a strategic step when planning and identifying needs. In all cases, there were recognized make or buy-decision but it is considered mainly from resource point of view. Currently, this is a valid point of view as the main responsibility of service provider is to purchase support services or subcontracting if needed. In some cases, those are required when service provider's own resources do not have enough qualifications.

Overall, the importance of thorough planning and identifying needs is recognized at the most of cases, but performance of this sub-process could be developed towards to more systematic and controlled management. Communication and information sharing could also be improved. That is a rather common issue in all process management related cases. If these issues would be improved, there could be effects to inventory levels and once again to availability and costs. Whilst cooperation between planning and procurement for needs identification and purchasing planning is important for daily maintenance, its importance increases when there are planned shutdowns. Regarding to the nature of shutdowns, including the limited time frame to perform certain works, the materials and services must be delivered on-time. If any work will be delayed, it often leads to delay of shutdown or that some works may be left out of current shutdown. That will naturally affect shutdown management.

Specify requirements and create RFQ

In all sites, specifying requirements and utilizing request for quotation seems to be a difficulty. The main problem is that there are sometimes unclear specifications included to purchase requests, that has sometimes partly caused purchasing of wrong items or materials. The importance of specified requirements and scope of service is high when there is possibly no professional purchaser or purchaser with technological capability available for supplier selection and actual purchasing.

Specification and SOS are also valuable from the suppliers' perspective as it gives better description of a purchase or the service they should provide. In cases those are not specified there might also occur problems on supplier's performance. Therefore, specification or SOS should be included into request for quotation. Regarding to RFQ, the level of utilizing it during procurement process remains low at sites too. There is limited utilization of automatic or standardized RFQs when quoted from suppliers. Instead, the quotation is requested by calling or emailing the supplier from whom it was ordered last time.

SOS is considered inevitable for service purchases in theory, and it is included for current guideline, but the implementation of SOS into quotations seems low as the utilization level of RFQ. Therefore, the performance of this sub-process can be considered insufficient. This is certainly a point for development, as on the most sites purchasing external services is the main task of procurement. Service purchases are also affecting to sites performance, and as a service provider itself there is needed to maintain trust to customer. Therefore, it is required that the services utilized should remain at the same level of excellence than what is required from service provider's work.

Supplier selection

Supplier selection is most often performed by the requestor i.e. maintenance engineer or supervisor, who most often selects the supplier used the previous time or that they have recognized to be qualified enough. Reason for such acts was told to be because purchases are often needed as soon as possible to site and there is not defined certain role and responsibility for supplier selection, i.e. no purchaser. This is basically opposite to the theory of supplier selection, in which is highlighted a thorough evaluation of quotations according to agreed criteria. Despite of that in some cases there were mentioned supplier selection criteria to be price, delivery time and quality.

Another issue in supplier selection is that even though the most utilized suppliers are selected, those are not documented into supplier base. Supplier base has been considered as a key tool to manage large amount of supplier data and thus, help the selection process. Based on the analysis, supplier selection is definitely the one to be improved and may generate cost savings in the long run.

There is also a difference to theory when supplier selection for service purchases is considered. Theory highlights the significance of SOS and RFQs before applying supplier selection criteria, as the buyer must work closely with the supplier. As SOS and regulated RFQs was mentioned to be rarely used in all cases, it can be considered that supplier selection is performed in a limited manner. Also the safety issues are critical ones in mill environment, therefore the supplier's commitment to safety regulations should be agreed before selecting a supplier.

Approval or contract

Currently, the approval of purchases and suppliers is more important task instead of contracting at sites. This is due to a fact that there are rarely selected new suppliers or there is no contract required. Otherwise, the purchase requests are approved according to monetary values in all cases. Site manager is the one who approves the most expensive purchases and regarding to some key purchases, customer may be involved as well.

Contract management is recognized as an important step, but only the formalization of contract has often been considered on sites. When sites are formalizing the contract, it was noticed that supplier has sometimes more emphasis to what is written into contract than sites. On another case is utilized knowledge of area procurement when creating and updating contracts. Despite of the emphasis on contract formalization, it seems that contract management is still in its infancy on sites. This means, that e.g. evaluation of supplier's performance according to agreed contractual terms should be covered. Contract management is important for both material and service contracts. Difference between those contracts is that service contracts would require clear SOS or in another term service level agreement (SLA). If there is agreed SOS, the management of contract would be easier regarding to evaluation of supplier's service performance that it meets the expectations.

In order to succeed in contract management, service provider's procurement should be considered as direct one instead of indirect, as the purchases, especially when purchasing support services, ends into final service. Currently, this aspect has not been thoroughly recognized. Therefore, the perspective should be recognized and communicated further to area procurement and company's procurement functions.

Purchase order creation and order follow-up

PO creation is a sub-process that seems to vary most within cases. In some cases, there are utilized information systems to send purchase orders to suppliers and in another case mainly only email or phone call. Also the person responsible for PO creation varies from requestor to purchaser or general assistant. This seem to be opposite to procurement process theory emphasizing the importance of automatized systems for purchasing order handling.

In theory, the involvement of purchaser into earlier stages of the process is emphasized, that cannot be seen to be applied properly in current case processes. This is especially the case due to lack of technology skills when, e.g. an assistant is responsible of purchasing orders. Therefore, if there is a lack of specifications or interaction with requestor, it would be possible that order includes wrong information leading to receiving of wrong item or material. In case of service purchases, lack of SOS or insufficient information of required service may lead to insufficient or misleading purchase order resulting to misunderstandings between buyer and supplier and further insufficient performance of service.

Another issue that varies is the order follow-up. In one case the supplier is required to send order confirmation with estimated delivery time, but in two cases there is no proper follow-up. There is also no difference whether it is bought materials or services. In theory the confirmation of order is assumed to be automatic and informative part of procurement process. Order and delivery confirmations are relevant information for order follow-up and they enable purchaser's faster reaction to possible delivery delays and thus, expediting actions. Therefore, those are important to follow daily to ensure higher availability and to inform requestor in order to ensure their ability to plan and perform works.

Receive order

Current state of receiving order at case sites seems to vary regarding to responsibility of inventory management according to contracts. In cases where inventory management is service provider's responsibility their receiving of purchased order is little or properly coordinated. In one case there is aim that purchaser accepts all received PO's, but can check only part of the orders by itself, otherwise inventory personnel are checking the orders. Instead, in another case all orders received are checked according to original PO. In the only case where customer is responsible of inventory management they are automatically

responsible of receiving orders. In that case there is noticed limited coordination and sometimes requestor is not informed about order received.

Even though in those cases where service provider is responsible of inventory management, there were recognized, that in one site the requestor is still not automatically informed about a received order. Thus, informing is infrequent. In another case of those the person who receives the order is required to inform the requestor. Informing the requestor about received order is crucial if it is aimed to reach an efficient process. Not informing may result to unnecessary inventory costs, delayed work performance, or unnecessary use of resources for searching the order.

In case of purchasing services, it is required that on each site a safety training for subcontractor coming to site is provided before they can start performing the service. Beside the safety training, in one case it was emphasized that subcontractor must be followed during their being on site. In addition to following their performance, there must be written a service conclusion that is checked before paying the invoice.

Make payment

When there were discussed about payment methods, it was mentioned that payments are handled in purchase ledger, despite of the fact that it was admitted some purchases are still made by phone or email. Therefore, it is assumed that even though the order is made by phone or email, it is later on written into information system. Despite of such aim, there is remarkably high risk that order is not ending up to information system, which will cause disruption to procurement process, when purchase order and invoice cannot be connected automatically in a system. It was also commonly agreed that invoices are not paid if those are not accepted by management. It is required that invoice match the original purchase order and delivered order or service. In order to accept the invoice, details must match and if there are need to correct the invoice, reclamation according to relevant proofs should be made.

Supplier evaluation

Supplier evaluation was also another sub-process that differs between cases, but it can be said to be insufficient in all of them. It is insufficient, for example, because it is not documented collectively in any site even if evaluation is made. In one case it was straight

admitted that there is no supplier evaluation performed neither to materials nor services purchased because there were several more critical deficiencies in procurement process, such as purchase request standardization. It is aimed that when procurement process is re-organized and running smoothly, the supplier evaluation could be considered as well.

Despite of infrequent documentation of evaluation results, two cases were able to identify certain evaluation criteria. In one case it was mentioned to be delivery, quality and service for materials, and time and speed for services. Instead, in another case it was mentioned to be price and quality for both materials and services. Even though, there are mentioned certain criteria for evaluation, the sites lack of utilizing key performance indicators (KPI) for suppliers, that are commonly agreed to be a useful tool for supplier evaluation.

Supplier evaluation of service suppliers was already discussed in contract management. Therefore, for service suppliers the evaluation should be continuous and not performed only when service is currently performed. Of course, the continuous evaluation of material suppliers is inevitable as well.

4.5 Maintenance procurement model

In this part is focused on introducing the framework and procurement process of maintenance procurement model. The framework was designed according to analyses of global sourcing models and strategic alignment, whilst procurement process is designed as a separate process map but it is aimed to include common sub-processes that are utilized through strategic alignment and outsourcing model. In the framework is introduced how maintenance sites' procurement is connecting to case company's procurement operations and which global sourcing model can be targeted to apply there. This framework is presented on figure 9 on next page.

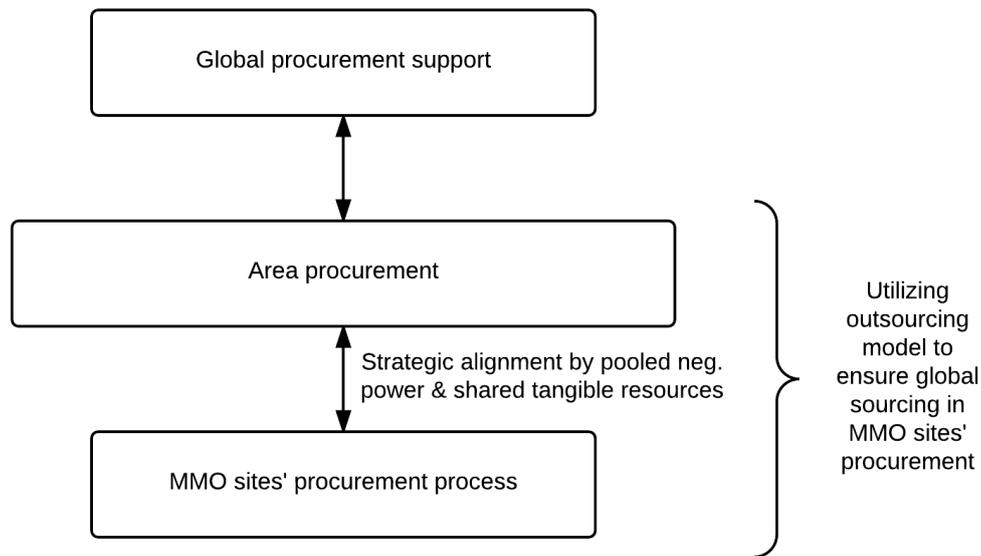


Figure 9. Framework of maintenance procurement model

On figure 9 can be seen how does strategic alignment and global sourcing will be affecting to maintenance sites' procurement. Thus, the introduced framework is the designed maintenance procurement model resulted from theory and empirical data. So far there has been only a rather weak link between maintenance sites' procurement and area procurement, but in the developed model the method will be changed that maintenance sites' procurement will be basically outsourced to area procurement to ensure strategic alignment and global sourcing activities in sites' procurement. In case the company's procurement would be fully centralized there would be no need to area procurement to be intervening.

If considered from procurement process point of view, global sourcing will be seen on supplier selection phase, when there is greater possibility to quoting both local/domestic and global suppliers through utilization of company's supplier base and supplier management information. Therefore, potential internal pooling of purchases, and thus creation of internal purchasing synergy towards to global suppliers may be utilized when quoting. Developed model also enable that purchaser may provide more information about local suppliers and their price levels, and offer other local market information to area procurement. Increased information of local suppliers could help for strategic analyses and give insights about cost competitiveness. With global sourcing and strategic alignment can also be introduced

improved professional procurement knowhow and tools for procurement at sites in addition to potential cost benefits.

In order to see the global sourcing and strategic alignment implications to maintenance sites' maintenance procurement process, main sub-processes of developed maintenance procurement model are introduced in a form of process map included into appendix II. In a process map there is added also more detailed actions than in theoretical procurement process map, but it includes the same theoretical sub-processes.

In addition to that, cross-functional cooperation between planning and scheduling, maintenance engineers and purchaser is not possible to describe on a process map, but it is explained here. Supplier evaluation is also not shown in a process map, because it is assumed to be continuous sub-process. Also, through strategic alignment and integration to area procurement function, it is possible to utilize and promote the needs and requirements of maintenance towards to purchased materials or services and suppliers. This integration possibility is seen in daily operations of area purchaser since the purchaser receive purchase request until the contract is made or purchase order is sent to supplier. The actual differences between current generalized procurement process and improved procurement process, with improvement recommendations is described in table 4 below.

Table 4. Differences in current and developed procurement processes

Sub-process	Current situation	Maintenance procurement model
Planning and identifying needs	Needs are identified when the work is about to be performed	Earlier involvement of procurement to work planning and scheduling, increased availability
Specify requirements and create RFQ	No standardized way to specify requirements and do RFQs	Engineers are responsible to specify requirements according to agreed rules and purchaser creates RFQ's accordingly
Supplier selection	Often selected automatically the previous supplier	Purchaser evaluates at least three suppliers according to set criteria
Approval or contract	Approval of purchases according to monetary values, contracts needed rarely	Approval according to monetary values, contract management and reviews when necessary

PO creation and follow-up	No standardized way to PO creation and follow-up	Ensuring that POs are in a system and up-to-date, informing requestor about order status until it is received and in inventory
Receive order	No standardized actions to order receiving	Inventory receive order, purchaser makes inspection that it is acc. to order and inform the requestor about received order
Make payment	Payment made after management's approval in purchase ledger	Payment made after management's approval in purchase ledger
Supplier evaluation	No proper supplier evaluation or KPI follow up	Purchaser performs continuous supplier evaluation in cooperation with engineers

With a developed maintenance procurement model is aimed to reach better management of procurement at sites both from cost and work management's perspective through presented improvements in table 4. Improved process would be more efficient and therefore, save resources throughout the process, and ensure that maintenance engineer can focus their resources on core activities. It is also aimed to reach a improved standardization of maintenance procurement at each globally dispersed sites and further target to more centralized and cooperative purchasing.

4.6 Recommendations

Recommendations are formed based on the analysis and how the model's target state could be reached. Recommendations can be divided accordingly to procurement process, framework and global sourcing, and future actions. Concrete operations that case company should take in order to improve their performance and apply the developed framework into practice are aimed to offer.

Procurement process

First of all, roles and responsibilities are recommended to be carefully assessed and communicated to site organization in order to have a baseline for process. If process is going to be implemented to site that already exists, change management is having important role.

Overall, the management and control of process and daily operations is significant to ensure successful operation of service provider.

In addition to the clear roles and responsibilities, the formation of cross-functional teams to plan and schedule purchases is important. Cross-functional teams are to ensure proactive purchase planning and specifications for materials and external services. The operation of cross-functional team is beneficial when considering daily procurement operations but especially to shutdown planning and management.

Another relevant point for successful performance of procurement process is the utilization of standardized templates for procurement tasks and documents, e.g. supplier selection criteria, contracts, and supplier evaluation. In a framework this is aimed to ensure through strategic alignment. Despite of this recommendation, e.g. utilization of standardized contract templates should be analyzed further according to area or country related regulations. Also information system related issues must be considered before companywide document templates can be implemented for sites' utilization. But it is in a key role that processes, tools, and documents are standardized in all maintenance sites according to company's common rules.

Referring to a fact that there is limited control or follow-up of what is purchased or what is the spend of purchases, it is recommended to ensure a link between procurement and cost control. This means that when procurement collaborate closely with work planning and scheduling, there is known the needs beforehand and thus, evaluation of the costs can be better estimated. This would have a valuable input to maintenance sites' cost control analysis further on. Other recommendations related to certain sub-processes are as following:

- planning and identifying needs: as mentioned already, forming cross-functional teams including planners and schedulers, maintenance engineers and purchaser/s.
- specify requirements and identifying needs: decide and communicate roles and responsibilities for this sub-process. Information is recommended to be shared within cross-functional team or directly to purchaser in a standardized form.
- supplier selection: recommended to perform according to companywide supplier selection process and utilize existing supplier base.

- approval or contract: remaining monetary limits for approval rights but it is recommended to put more emphasis on contract management, especially for support service suppliers, through companywide supplier relationship management process.
- purchase order and order follow-up: requiring and ensuring that all purchase orders are made in information systems and requiring order confirmation and delivery updates from suppliers. Purchaser must also inform the requestor about order delivery status and possible delays.
- receive order: agree clear roles and responsibilities depending on is it service provider's or customer's responsibility to manage inventory. Require and ensure communication between inventory personnel, purchaser and requestor.
- make payment: if all POs can be ensured to be in information system as recommended, orders and invoices can be matched automatically in a system as required in company's procurement guidelines.
- supplier evaluation: follow and perform supplier evaluation according to rules defined in companywide supplier relationship management process. E.g. ensure that all suppliers are evaluated according to agreed KPIs.

Regarding to process related recommendations, the key issues are having clear communication throughout both site and area organization and customer in site environment, as well as good management of both processes and people.

Framework and global sourcing

The main aim of the framework is to ensure efficient processes and tools for maintenance sites to provide a base for successful procurement process. In order to ensure future utilization of the framework it is recommended that there would be assigned purchaser for maintenance site in area procurement function. Therefore, recommendations to ensure strategic alignment is to gain commitment from executive management to facilitate potential organizational changes required, and to increase the both awareness of maintenance and its operational needs for purchasing and cooperation to procurement in all areas.

At the moment the developed framework of model is focusing on centralizing the maintenance sites' procurement in area level through outsourcing construct, but in the future there should be considered the benefits of centralized procurement and thus, true global sourcing in case company level. In order to achieve centralized procurement model for

global sourcing, the organization of the company becomes of an issue, if referred to definition of centralization according to Leinonen (1999): matrix organization is always a hybrid. Therefore, if true global sourcing is targeted to achieve within a company, corporate function should consider organizational structures and possible changes towards to more centralized management of processes.

Global sourcing affect most to supplier selection and contract management within maintenance sites. In order to ensure the utilization of global sourcing within the possible degree, it is recommended to have cooperation through company's supplier relationship management process with different business lines. Also when it is aimed to outsource sites' procurement to area's procurement function, the level of company's global sourcing affects to the result. Throughout the company, there should be reached a higher degree of centralization to ensure that company's purchasing synergy is utilized in its full potential to suppliers whether through global contracts or even with country or area specific contracts.

Regarding to global sourcing, it is also visible that the importance of certain larger, globally operating suppliers is not fully understood or recognized in a company level. Therefore, as for maintenance business e.g. support services are certainly direct purchases, the requirements and needs should be communicated through companywide procurement process to suppliers in order to negotiate better contracts.

In addition, regarding to global sourcing success factors the recommendations are more towards to companywide global sourcing activities, as the model is constructed in a way that most of the support and guidance would come through corporate function. Therefore, the main recommendation is to receive managerial commitment to actions increasing the degree of centralization in procurement and global sourcing operations. This recommendation is also supporting further organizational design related actions and improve standardization and coordination of processes referred as well-defined processes in success factors. These two recommendations would ensure better utilization of maintenance procurement model as well as its further development. For other success factors, recommendations are more related to overall continuous development of operations, e.g. ensuring capability management to ensure qualified resources, search how new ERP would support if there were higher centralization, and continuously update and support supplier evaluation of both supplier's performance and savings.

Referring to success factor of information technology and company's current ERP development, a recommendation for maintenance business would be to actively search how does ERP and its functions support sites' daily maintenance operation and procurement management. This is crucial as conflicts related to information system at sites are seen due to utilization of both service provider's and customer's ERPs. Therefore, utilization of information system at site with customer interface should be focused on. This is also a necessity if maintenance procurement model would be wanted to turn into separate sales item.

Possible future actions

Basically, the model presented in this research is possible to consider as the first step of a larger project. This is because, framework and top-level process map of the model is formed based on research of two areas' procurement function. In order to ensure its true applicability in a global scale it is recommended to continue the development work regarding to other areas' procurement function and maintenance sites, and their readiness to certain model. Also there is a need to research information system related issues as the sites utilizes both customer's and case company's information systems. Secondly, the model relies on company's procurement processes and strategy for those actions, but actual purchasing strategy considering needs and capabilities of maintenance procurement will be necessary to identify in a long run.

Pilot case could be considered as a following step, as the applicability of the model can be seen and found out practical development issues. Thus, with pilot case, the model's suitability for further implementation to all sites could be improved. During this research, it was found out that a site within EMEA could be recommended to select for a pilot case. This is due to EMEA procurement changes and model's suitability to new changes. There is also a site, that could be possible site for this pilot case, as there has already done process development and there is willingness to closer area cooperation.

After the pilot case, the most important elements of procurement would be possible to see. Those elements could be developed to form a sales item offering procurement services as a smaller concept to customers. A relevant factor is also to consider within maintenance business that what is the ideal contract scope regarding to procurement responsibilities. If certain responsibilities are agreed and only limited tailoring options are offered, there is a

possibility to create sales item of procurement services. In that way the sales item could be offered in a global scale.

In order to ensure sufficient level of support and maintenance purchase knowhow in areas' procurement function, it would be important for maintenance sites to communicate the needs and requirements towards to purchased items and services, and suppliers. When communicated to areas' procurement function, the support for local or domestic problems could be found out. But if there is looked for a solution in a larger extent or global scale, the communication should go through companywide procurement management process including supplier relationship management activities.

In addition to the companywide communication, there is need to actively aim to change the mindset towards to purchase types, especially regarding to certain support service suppliers. There were found some cases in which a key supplier for direct purchases at maintenance sites is considered as indirect within a company. There should be communicated that whilst there is no difference in actual procurement process, there is differences in supplier management activities regarding to expectations and requirements having effects to service quality in a long run.

5 CONCLUSIONS

Maintenance procurement is covering most of the maintenance service providers' expenses. Therefore, defining a type of purchases and procurement process is crucial in order to control and possibly minimize those expenses. Another challenge in maintenance procurement is the extent of local suppliers' utilization over global suppliers.

The maintenance procurement model designed in this research is so called 'area based model' and reflecting the level of global sourcing in the case company's procurement function. It is aimed to improve the current situation of maintenance sites' procurement, but yet there is room for further improvements towards to higher degree of global sourcing. Strategic alignment can be seen as a tool to ensure the global sourcing within a developed model and in the future. In order to improve the developed maintenance procurement model further on, there would be required changes in organizational structure towards to higher centralization of the processes.

The maintenance procurement model will be affecting to maintenance sites procurement process in a way that it increases the level of both area and global support and introduce a possibility to integrate into those operations. Through integration there is a possibility to communicate maintenance sites' needs and requirements towards to materials, services and suppliers. This is assumed to be leading also to better contract management. All the improvements made to developed maintenance procurement model are aimed to increase the level of control and coordination of purchases at site, as well as to gain cost savings.

In order to answer to the research question, it was important to recognize the main factors that are affecting to maintenance sites' procurement. Those factors are procurement process, organizational and managerial structures. Therefore, to the designing of maintenance procurement model, recognition of those main factors were in key role. The answer to the main question enabled designing of maintenance procurement model with global sourcing element. Thus, the answer to question: "how should a global maintenance procurement model be designed?" is to enable alignment of procurement process and resources into area managed procurement function to ensure utilization of global sourcing, whilst ensuring control and management of process through site and area resources.

In the case company, one of the main challenges was limited professional knowhow of procurement. Also the sites were not utilizing company's common processes nor tools for procurement, that has led to sites operations to be rather separate even though being under area management. Therefore, the current state of sites' procurement emphasizes the importance of enabling strategic alignment and through that global sourcing element integration into maintenance site procurement.

Secondly, the answer to the second sub-question offers the information of those procurement process' sub-processes that have the most effect to maintenance procurement at site. Those key sub-processes were identified to be as following: needs' identification, requirements' specification, supplier selection, and contract management. These were also the sub-processes that could be considered to have most 'problems' in practice when compared to theory. Regarding to the developed procurement process for maintenance sites, the main aim is to increase the control and management of the process by establishing clear roles and responsibilities for each tasks and increase the level of information sharing.

As mentioned already, strategic alignment was considered to be an enabling factor for the developed maintenance procurement model. Its importance is to offer common operations and tools in order to save resources and gain cost savings. Therefore, aligning case company's strategy regarding to procurement into maintenance procurement model is considered to ensure more efficient operative processes and tools, as well as strategic objective to sites' performance. Answer to this third sub-question is to utilize pooled negotiation power and shared tangible resources to align areas' procurement function and maintenance sites' procurement.

Overall, the main idea was to introduce improved and more efficient processes to maintenance sites through developed maintenance procurement model. Improved and more efficient processes can be ensured through strategic alignment and utilizing internal resources. Another issue is to ensure better control and management to the process through assigned resource, but development of site management should be considered as well.

5.1 Success factors for maintenance procurement model

As procurement process and global sourcing are already considered as success factors, implementation and utilization this developed maintenance procurement model would be one success factor. Other success factors are more or less related to ensuring sufficient communication at the right time for the right persons. Also, the ability to perform strategic decisions and manage contracts are having effects in a long run. Success factors are having a major impact to key sub-processes identified in the research.

First of all, *controlled and managed process* is considered as a key to successful operations. This means that when operations and tools are given, it should be managed that each employee is committed and are utilizing them as required. Control instead is required to ensure that procedures are followed and the amount of purchases remain within given budget. One method to achieve controlled and managed process, is cooperation and communication, which is the second success factor. *Cooperation and communication* ensure that employees are committed and information can be shared at the right time, to right person, through right channel, and with sufficient and right content. These are also a key factors to ensure that availability of parts remain in a sufficient level, and new orders can be placed and received at the right time for work execution. Instead, internal cooperation across horizontal line, i.e. business lines could ensure creation and utilization of internal purchasing consortium offering increased negotiation power especially towards large global suppliers.

As referred to availability, the *ability to plan* the work and purchases is in a key role in a successful process. Especially in maintenance service business, often the availability of machine for production is an important factor, thus when service provider is responsible of purchasing materials and external services, the right timing remains more important through whole service system. In order to ensure right timing, the works and purchases should be planned in cooperation with engineers and purchaser, i.e. utilization of cross-functional team.

Another success factor for maintenance procurement model is to increase the utilization of *bidding*. This means that bidding is only purchaser's responsibility in order to ensure compliance. In maintenance environment it is typical that engineers have power to select supplier and there is high risk of utilizing same supplier when there is not compliant

relationship between engineer making purchases and supplier. When there is global sourcing element aimed to add to process, the role of controlled and compliant bidding is increased. On those cases, global sourcing strategy of the company is influencing the bidding and supplier selection.

Regarding to global sourcing element integration into maintenance procurement, the *success factors of global sourcing* are relevant to consider. All of those success factors are important from both perspective of company level global sourcing strategy, and executing global sourcing for maintenance sites. Especially management commitment is important both for global sourcing strategy but also overall to further implementation of maintenance procurement model. From global success factors, also *availability of resources* can be considered to be relevant for maintenance procurement model in a long run. Availability of skilled resources throughout the process ensure that needs are identified properly and qualified suppliers reached by having certain requirements and supplier selection criteria.

5.2 Future research

In this research, have been focused on how procurement process and global sourcing can be connected together with the help of strategic alignment. But yet there is not specified any certain supply strategy that could be the most optimal for this maintenance procurement model. Therefore, future research, especially regarding to global purchasing strategy could focus more from first, maintenance service perspective, and second, procurement in hybrid MNCs. One important issue that could be considered from this perspective is pooling of several business units' purchases, when there is a common item but it is having different position or category in different business unit. This may cause difficulties from strategy point of view.

Certain topics appeared regarding to global sourcing for future research. One issue is related to global sourcing and purchase type. Even though it was noticed that purchase type (i.e. direct, indirect or service) does not affect much to procurement process, there may be limitations to which of materials or services can be purchased from global suppliers. E.g. one of the most typical examples of global sourcing is that the higher the degree the higher the rate of horizontally pooled purchases is, despite of purchases' type. But it would be

important to research in the future that how does that affect if purchase is considered as a different type in different business unit or whether global sourcing can be utilized to all external services purchased.

In addition, outsourcing is often mentioned to be an operation that is not a core competence of a company and thus, it is often referred to be support services. Instead, during this research was noticed that some customers are willing to outsource at least limited parts of their procurement process. Therefore, more extensive research about customers' willingness to outsource procurement process, and in which extent would be important from service providers' perspective in order to improve their service sales items. For the same purposes, handling operational purchasing through ERP when there are two systems and their interface, could be researched.

REFERENCES

- Arnold, U. (1999) Organization of global sourcing: ways towards an optimal degree of centralization. *European Journal of Purchasing & Supply Management*, vol. 5, pp. 167-174.
- Baier, C., Hartmann, E. & Moser, R. (2008) Strategic alignment and purchasing efficacy: an exploratory analysis of their impact on financial performance. *Journal of Supply Chain Management*, vol. 44, no. 4, pp. 36-52.
- Balakrishnan, A. & Natarajan, H.P. (2014) Integrated procurement planning in multi-division firms. *Production and Operations Management*, vol. 23, no. 10, pp. 1795-1810.
- Beukers, M., Versendaal, J., Batenburg, R., Brinkkemper, S. (2006) The procurement alignment framework – construction and application. *Wirtschaftsinformatik*, vol. 48, iss. 5, pp. 323-330.
- Brandmeier, R. A. & Rupp, F. (2010) Benchmarking procurement functions: causes for superior performance. *Benchmarking: An International Journal*, vol. 17, iss. 1, pp. 5-26.
- Burt, D.N. & Pinkerton, R.L. (1996) *A Purchasing Manager's Guide to Strategic Proactive Procurement*. New York: AMACOM.
- Day, M. & Lichtenstein, S. (2006) Strategic supply management: The relationship between supply management practices, strategic orientation and their impact on organisational performance. *Journal of Purchasing & Supply Management*, vol. 12, pp. 313-321.
- de Boer, L., Labro, E. & Morlacchi, P. (2001) A review of methods supporting supplier selection. *European Journal of Purchasing & Supply Management*, vol. 7, pp. 75-89.
- Faes, W., Matthyssens, P. & Vandenbempt, K. (2000) The pursuit of global purchasing synergy. *Industrial Marketing Management*, vol. 29, pp. 539-553.
- Gelderman, C.J. & Semeijn, J. (2006) Managing the global supply base through purchasing portfolio management. *Journal of Purchasing & Supply Management*, vol. 12, pp. 209-217.

Ghoshal, S. & Nohria, N. (1989) Internal differentiation within multinational corporations. *Strategic Management Journal*, vol. 10, pp. 323-337.

Godoy, D.R., Pascual, R. & Knights, P. (2014) A decision-making framework to integrate maintenance contract conditions with critical spares management. *Reliability Engineering and System Safety*, vol. 131, pp. 102-108.

Hartmann, E., Trautmann, G. & Jahns, C. (2008) Organizational design implications of global sourcing: A multiple case study analysis on the application of control mechanism. *Journal of Purchasing & Supply Management*, vol. 14, pp. 28-42.

Jeeva, A. (2008) Supplier intelligence in MRO procurement. 2008 IEEE International Conference on Service Operations and Logistics, and Informatics, October 12 – October 15, Beijing, China.

Kauppalehti. (2016) Neste ja Valmet jatkavat Dow Jonesin kestäväen kehityksen indeksissä [online document]. [Accessed on 15 September 2016]. Available at <http://www.kauppalehti.fi/uutiset/neste-ja-valmet-jatkavat-dow-jonesin-kestavan-kehityksen-indeksissa/qi553LaV>

Kim, J-I. & Shunk, D.L. (2004) Matching indirect procurement process with different B2B e-procurement systems. *Computers in Industry*, vol. 53, pp. 153-164.

Lapan, S.D., Quartaroli, M.T. & Riemer, F.J. (2011) *Qualitative Research: An Introduction to Methods and Designs*. San Francisco: John Wiley & Sons, Inc.

Le Sueur, M. & Dale, B.G. (1998) The procurement of maintenance, repair and operating supplies: a study of the key problems. *European Journal of Purchasing & Supply Management*, vol. 4, pp. 247-255.

Leinonen, J. (1999) Adoption of global sourcing strategies in industrial multinational corporations: Building a Conceptual Framework. Licentiate Thesis in Marketing. Vaasa, University of Vaasa, Faculty of Business Administration, Department of Marketing.

Lintukangas, K., Kähkönen, A-K. & Virolainen, V.M. (2013) The antecedents of supply strategy. *European Business Review*, vol. 25, iss. 5, pp. 396-410.

- Lysons, K. & Farrington, B. (2006) *Purchasing and Supply Chain Management*. 7th ed. Edinburgh Gate: Pearson Education Limited.
- Metsämuuronen, J. (2006) *Laadullisen tutkimuksen käsikirja*. Helsinki: International Methelp Ky.
- Mohamad, M.N., Julien, D.M. & Kay, J.M. (2009) Global sourcing practices: the perceived importance of success factors and issues of actual implementation. *International Journal of Logistics Research and Applications*, vol. 12, no. 5, pp. 363-379.
- Quintens, L., Pauwels, P. & Matthyssens, P. (2006a) Global purchasing strategy: Conceptualization and measurement. *Industrial Marketing Management*, vol. 35, pp. 881-891.
- Quintens, L., Pauwels, P. & Matthyssens, P. (2006b) Global purchasing: State of the art and research directions. *Journal of Purchasing & Supply Management*, vol. 12, pp. 170-181.
- Rajagopal, S. & Bernard, K.N. (1993) Globalization of the procurement process. *Marketing Intelligence & Planning*, vol. 11, iss. 7, pp. 44-56.
- Rajagopal, S. & Bernard, K.N. (1994) Global procurement: motivations and strategy. *Marketing Intelligence & Planning*, vol. 12, iss. 9, pp. 4-17.
- Rozemeijer, F. (2000) How to manage corporate purchasing synergy in a decentralised company? Towards design rules for managing and organising purchasing synergy in decentralised company. *European Journal of Purchasing & Supply Management*, vol. 6, pp. 5-12.
- Ruhrmann, S., Hochdörffer, J. & Lanza, G. (2014) Assessment of dynamics and risks in supplier selection processes. 8th International Conference on Digital Enterprise Technology – DET 2014 – “Disruptive Innovation in Manufacturing Engineering towards the 4th Industrial Revolution”, *Procedia CIRP*, vol. 25, pp. 2-9.
- Shin, H., Collier, D.A. & Wilson, D.D. (2000) Supply management orientation and supplier/buyer performance. *Journal of Operations Management*, vol. 8, pp. 317-333.

- Smart, A. & Dudas, A. (2007) Developing a decision-making framework for implementing purchasing synergy: a case study. *International Journal of Physical Distribution & Logistics Management*, vol. 37, iss. 1, pp. 64-89.
- Sollish, F. & Semanik, J. (2012) *The Procurement and Supply Manager's Desk Reference*. 2nd ed. New Jersey: John Wiley & Sons, Inc.
- Talluri, S. & Narasimhan, R. (2004) A methodology for strategic sourcing. *European Journal of Operational Research*, vol. 154, pp. 236-250.
- Trautmann, G., Bals, L. & Hartmann, E. (2009) Global sourcing in integrated network structures: The case of hybrid purchasing organizations. *Journal of International Management*, vol. 15, pp. 194-208.
- Trent, R.J. (2007) *Strategic supply management – Creating the Next Source of Competitive advantage*. Fort Lauderdale: J. Ross Publishing, Inc.
- Trent, R.J. & Monczka, R.M. (1999) Achieving world-class supplier quality. *Total Quality Management*, vol. 10, no. 6, pp. 927-938.
- Trent, R.J. & Monczka, R.M. (2002) Pursuing competitive advantage through integrated global sourcing. *Academy of Management Executives*, vol. 16, no.2, pp. 66-80.
- Trent, R.J. & Monczka, R.M. (2003) Understanding integrated global sourcing. *International Journal of Physical Distribution & Logistics Management*, vol. 33, iss. 7, pp. 607-629.
- Trent, R.J. & Monczka, R.M. (2005) Achieving excellence in global sourcing. *MIT Sloan Management Review*, vol. 47, no. 1, pp. 24-32.
- Tsang, A.H.C. (2002) Strategic dimensions of maintenance management. *Journal of Quality in Maintenance Engineering*, vol. 8, iss. 1, pp. 7-39.
- Tuomi, J. & Sarajärvi, A. (2009) *Laadullinen tutkimus ja sisällön analyysi*. 5th ed. Helsinki: Kustannusosakeyhtiö Tammi.

Valmet. (2016a) Annual Review 2015 [online document]. [Accessed on 22 August 2016]. Available at http://www.valmet.com/globalassets/investors/reports--presentations/annual-reports/2015/annual_review_2015.pdf

Valmet. (2016b) Financial Statements 2015 [online document]. [Accessed on 22 August 2016]. Available at <http://www.valmet.com/globalassets/investors/reports--presentations/annual-reports/2015/financial-statement-2015.pdf>

Valmet. (2016c) Valmet's Way Forward [online document]. [Accessed on 15 September 2016]. Available at <http://www.valmet.com/about-us/strategy/valmets-way-forward/>

van der Valk, W. & Rozemeijer, F. (2009) Buying business services: towards a structured service purchasing process. *Journal of Services Marketing*, vol. 23, iss. 1, pp. 3-10.

van Weele, A.J. & Rozemeijer, F.A. (1996) Revolution in purchasing – Building competitive power through proactive purchasing. *European Journal of Purchasing & Supply Management*, vol. 2, no. 4, pp. 153-160.

Yeniyurt, S., Henke Jr., J.W. & Cavusgil, E. (2013) Integrating global and local procurement for superior supplier working relations. *International Business Review*, vol. 22, pp. 351-362.

APPENDIX 2. Maintenance procurement process

