Master's degree thesis

LOG950 Logistics

Intra-Organizational Information Sharing for Purchasing Activities in Shipbuilding

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Abstract

For most companies today, the cost of purchased goods and services makes up a dominant amount of total costs. In a shipbuilding organization purchasing costs may account for about 75 % of the value of a contract. The purchasing function is of significant importance for profit generation and organizational performance, and is increasingly viewed as strategically important function. Information is also critical to an organization's ability to be competitive. In today's information driven and technologically advanced economy, organizations are more than ever dependent on the cumulative knowledge of their employees, suppliers, customers, and other stakeholders. Research has shown that organizations that encourage information sharing have gained competitive advantage in the long run as information has become a key force to organizational success. The value of knowledge and information increases as it is shared and how to promote information sharing among employees so that organizations can leverage this resource has become a key managerial issue.

This thesis has attempted to provide insight into the understanding of intra-organizational information sharing in purchasing activities and performance in shipbuilding. It is believed that improving information sharing in purchasing activities will have a positive effect on purchasing performance. By integrating relevant research on intra-organizational information sharing and purchasing activity, and performing a case study of the Havyard Group AS, the research has discovered challenges, barriers, and facilitators of intra-organizational information sharing for purchasing activities in shipbuilding. Some of the most important challenges have been found to be information sharing between functional units, information sharing between purchasing departments, and information sharing between purchasing employees. The case study of Havyard disclosed that the main barriers of intra-organizational information sharing are caused by organizational structure, organizational culture, poor information systems, and characteristics of information. The findings of the case study suggest that intra-organizational information sharing for purchasing activities and performance will be enhanced if the management implement measures such as making the entire organization value information as a key strategic resource, foster trust between organizational members, foster a belief in information as a collective resource, become better at attending cross-functional meetings, arrange social

events for the employees, use performance-based reward systems and evaluations, invest in better IT-solutions, and implement mandatory IT-training for the employees.

Key words: Intra-organizational information sharing, purchasing

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1 Introduction

1.1 Background

Purchasing has through the last decades been increasingly viewed as a strategically important function. The increased amount of outsourcing and the purchasing function's central role in securing an optimal supply situation are considered significant contributors to this (Brynhildsvoll & Abrahamsen 2008). For most companies, the cost of purchased goods and services makes up a dominant amount of total costs. A study among 32 American industries revealed that 16 had purchasing costs that amounted to 50 % or more. Likewise a Swedish study showed that purchasing represented 51 % of the total on an average basis. The purchasing function is of significant importance for profit generation (Gadde & Håkansson 2001).

The purchasing function is a significant contributor to the success of a shipbuilding organization as well. Strategically this function is the link of the company to the suppliers. In a technologically advanced and innovative intensive industry the suppliers are a great source of competitive power. Establishing good relations one can make good use of and exploiting this in an appropriate manner is essential. And economically, purchasing may account for about 75 % of the value of a contract. If for example a new Platform Supply Vessel (PSV) has a contract value of 350 million NOK, the purchase of material, equipment and services may stand for 263, 5 million NOK. And of total expenditures, purchasing may hold an 85 % portion (Appendix 3).

In the shipbuilding industry, information sharing is a challenging task. Hundreds of suppliers, hundreds of workers, millions of parts to puzzle together, and an intensive time pressure overseeing it all. Shipbuilding is a project oriented activity. Each project is unique, and the complexity involved in such an operation can be overwhelming. There is a huge coordinating task inherent in the process. And coordination requires information sharing. The amount of information needed for a smooth operation on a daily basis is extensive. The costs involved are significant, and the inherent consequences of a problematic building process can have serious outcomes for an organization.

Information is in general critical to an organization's ability to be competitive. In today's information driven and technologically advanced economy, organizations are more than ever dependent on the cumulative knowledge of their employees, suppliers, customers, and other stakeholders. Information is the foundation for decision making, and developing positive information sharing behaviors can enable faster information flow, improve efficiency and effectiveness, facilitate faster response to customer's changing needs, have positive impact on task performance and improve overall productivity. Research has shown that organizations that encourage information sharing have gained competitive advantage in the long run as information has become a key force to organizational success. (Barua et al. 2007, Hatala & Lutta 2009, Hsu & Wang 2008, Kim & Lee 2006, Kolekofski Jr. & Heminger 2003)

When information is not shared and used, it is not being fully utilized as an organizational resource (Kolekofski Jr. & Heminger 2003). Limited information sharing in an organization will most likely lead to information gaps. With limited access to information, organizational members lack the capability to develop integrated solutions to problems. Successful information sharing is dependent on a free flow of information among members within the organization and that this information is undistorted and up- to-date. Restricted information flow will leave an organization unable to prepare for sudden changes in its surroundings and hinder adaptation to environmental changes (Hatala & Lutta 2009). The value of knowledge and information increases as it is shared and how to promote information sharing among employees so that organizations can leverage this resource has become a key managerial issue (Hsu & Wang 2008)

Information sharing can be both external with parties outside the organization, and internal with parties inside the organization. This thesis is concerned with those factors that affect intra-organizational information sharing in a shipbuilding company. As the purchasing function is the most cost influential function in such a company, improving information sharing in purchasing activity can have a significant impact on organizational performance.

1.2 Research Problem

A research problem, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same. The research problem requires the researcher to find the best course of action to solve the problem in a given environment (Dhawan 2010).

While there are many contributions in the literature concerning intra-organizational information sharing, there seems to be lacking research on information sharing within specific functional areas of an organization. This study attempts to provide insight into the understanding of intra-organizational information sharing in purchasing activities and performance. The Chief Procurement Officer (CPO) of a shipbuilding enterprise at the West Coast of Norway has recognized the fact that there is certain information within the organization that is not being shared and as a result purchasing performance is not at a desired level (Appendix 1-3). Based on the recognition of information as a key force to organizational success, it is believed that improving information sharing will have a positive impact on purchasing performance. This study will look at the factors that prevent information from being shared and how this can be altered as to facilitate intra-organizational information sharing within the context of a shipbuilding company. The characteristics of purchasing activity will be taken into account, and the thesis aims to integrate relevant research on intra-organizational information sharing and purchasing activity. Due to lack of prior research, the study has an explorative nature. Benbasat et al. (1987) advocates that case research is particularly appropriate for problems in which research and theory are at an early, formative stage. Valuable insights can be gained through case research as it allows the researcher to answer "how" and "why" questions which are important in getting an understanding of the nature and complexity of processes. This study has therefore undertaken a case study of the Havyard Group AS. The Havyard Group is a fully integrated shipbuilding enterprise located at the West Coast of Norway.

The following research questions provide a framework for the study:

> Q1: What are the information needs in purchasing activity and for improved purchasing performance in shipbuilding?

Q2: What factors act as barriers to intra-organizational information sharing in purchasing activity and for purchasing performance in shipbuilding?

Q3: How can intra-organizational information sharing in purchasing activity and for enhanced purchasing performance in shipbuilding be improved?

1.3 Significance of Study

The significance of this study can show itself both from a theoretical perspective as well as from the perspective of a Norwegian shipbuilder such as Havyard.

Theoretically, there are is a gap in the literature concerning intra-organizational information sharing for specific functional areas. This study may provide some insight into the factors affecting intra-organizational information sharing for purchasing activity and performance.

As already presented, the purchasing function is one of if not the most cost influential functions in most companies today. For the purpose of reducing costs within a company, this area of operation would therefore be a logical one to look at. And for a Norwegian shipbuilder, cost efficiency is of particular importance. In a report detecting the status for maritime industries in the Møre and Romsdal region in Norway, Hervik et al. (2010) have found that especially shipbuilders are dependent on being cost efficient in order to survive. The years leading up to the financial crisis in 2008 were a time for massive growth in the maritime industry worldwide. But when the recession came the overcapacity proved itself evident. The graph below shows the profit margins for some of the key actors in the maritime cluster, namely shipbuilders, shipping companies, ship consultants, and sub contractors.

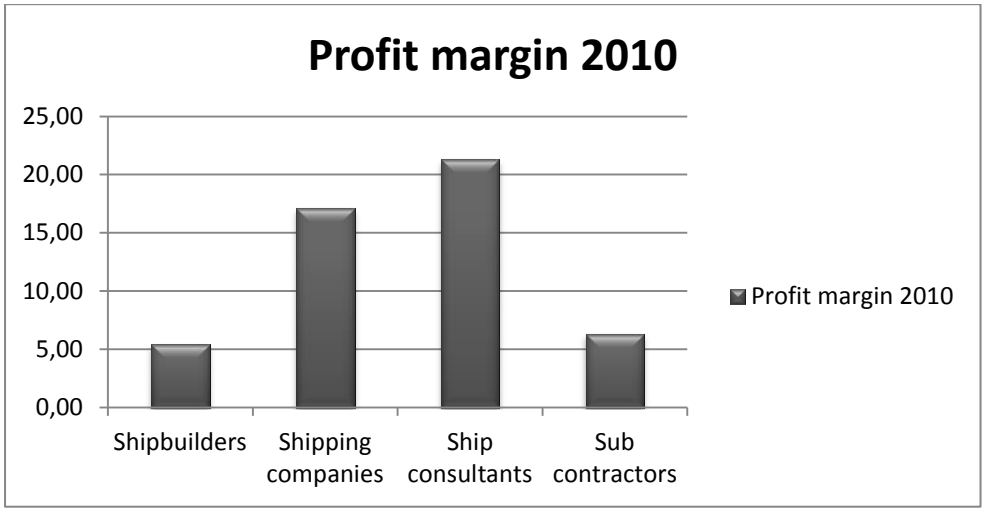

Figure 1-1: Profit margin for key actors in the maritime cluster in Møre and Romsdal in 2010 (Hervik et al. 2010)

The shipbuilders have the lowest margins in their operations. Scientists have speculated in an uneven distribution of risks and benefits in the value chain of the cluster. It could seem like the shipbuilders are losing an internal battle. They seem to be carrying most of the economic responsibility tied to delays, backorders, and excessive use of resources (Oterhals 2011). The shipbuilders are in other words quite dependent on developing sustainable, cost-efficient solutions.

1.4 Organization of Thesis

The thesis consists of 7 chapters. Chapter 1 is an introduction to the study, presenting the research problem and its significance. Chapter 2 constitutes the theoretical framework of the study and is split in two parts. One part will focus on the role of purchasing in an organization, with the inherent activities and information needs in a purchasing function. The second part will present literature on intra-organizational information sharing and the factors affecting this in general. Chapter 3 presents the research methodology of the study, and provides explanations for chosen research design, data collection methods, and an evaluation of quality of research. Chapter 4 is the analysis of the study and this is where the case study of Havyard has been used to answer the research questions. Chapter 5 forms the conclusion and limitations of the research and suggests further research to be conducted. Finally, chapter 6 is references and chapter 7 is the appendixes.

2 Theoretical Framework

This chapter presents the theoretical framework of the research. The theories presented here acts as validation for the information gathered throughout the study. The aim of the theoretical framework is to identify the activities and information needs of a purchasing function, and explain what is meant by purchasing performance in the context of this study. Further, the theoretical framework will present earlier research on the factors affecting intra-organizational information sharing in general.

2.1 The Role of the Purchasing Function within an Organization

Brynhildsvoll & Abrahamsen (2008) describe purchasing as the acquisition of products and services from external sources that are necessary to operate, maintain, and manage an organizations primary and supporting functions under the best possible conditions.

The purchasing function within an organization can take on an operational, tactical, or strategic role. An operational role refers to specific cases where a purchase is made based on one agreement or contract with a supplier. This delivery can compose of several product and services, and can be single or repeated purchases. A tactical role also involves activities that are related to the purchase. These activities are often described in a set of rules and procedures. A strategic role encompasses activities related to an organizations overall supply situation such as structuring suppliers and making long term decisions for positioning in the supply market. These roles of purchasing follow a hierarchical structure. Operational purchasing is at the lower level while strategic purchasing is done by the top management in an organization (Brynhildsvoll & Abrahamsen 2008, Van Weele 2010). Figure 2-1 illustrates this.

Figure 2-1: The different roles and levels of purchasing in an organization

2.1.1 Activities of the Purchasing Function

The most important activities of the purchasing function are to:

- Secure timely and undisturbed availability of goods and services. This is both long term and short term, and must be consistent with the internal requirements in the organization. Supply must be secured from reliable sources of a consistent quality at a reasonable cost.
- Control and reduce all purchase-related spending. This involves making sure goods and services are acquired at fair and competitive prices from the best possible suppliers. Balancing cost versus risk and value is an important consideration.
- Reduce the organization's risk exposure in supply markets. This means having reliable suppliers, and not being too dependent on few sources of supply.
- Contribute to product and process innovation. Suppliers are often a source of new products and technology, and research and development often happens in interaction with suppliers.

(Van Weele 2010)

The activities of the purchasing function are diverse and may be different depending on the organization and the requirements within that organization. The activities of a purchasing

function in this study will therefore be restricted to the activities of the purchasing process. What they are will be covered in the next section.

2.1.2 The Purchasing Process

The purchasing process will always have a defined start and finish as there will go some time from a purchase need arises till it is met. Along the way, several decision must be taken, and one decision is build on the premises of the previous ones. The sequence of decisions follows a certain course and is not random. While some steps in the purchasing process can be dealt with in parallel activities, the milestones and decisions usually cannot switch places. Figure 2-2 shows the purchasing process as articulated by Brynhildsvoll & Abrahamsen (2008).

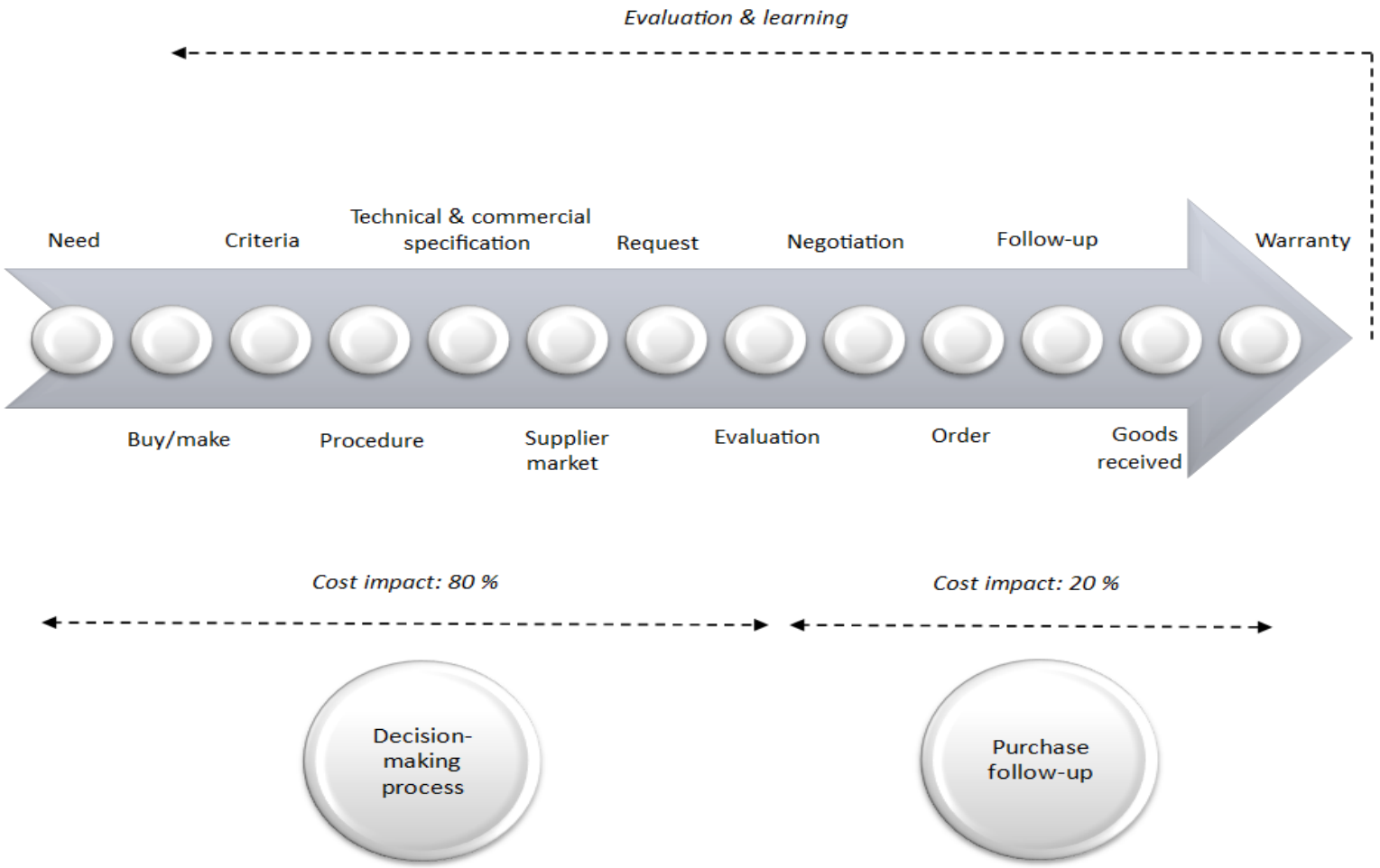

Figure 2-2: The purchasing process (Brynhildsvoll & Abramhamsen 2008)

Step 1 – Need Recognition

The process is initiated by a need for purchase. An employee prepares a requirement notification that contains at least a minimum of information of the type of solution that is required to solve a need. In most cases there are several options for covering the need. If the requested solution is a detailed specification, there are however fewer options at hand. In situations where a solution is basically decided upon before the purchasing process has even started, the supplier market is not in a position to offer alternative solutions, and it can be termed as a monopolistic supplier situation. The purchasing process can also be initiated by forecasts or automatic order requirements from a storage system etc. (Brynhildsvoll & Abrahamsen 2008).

Step 2 – Buy/Make Decision

At the second step of the purchasing process the organization evaluates whether the need can be covered by producing the solution internally, or if a solution will have to be found in the supplier market. This step is usually not a time consuming activity as there is seldom doubt about what needs to be purchase and what one can make within the organization. However, if such a consideration is made the general trend shows that organizations today are heading more and more towards outsourcing activities than towards insourcing. One of the main reasons for this is that due to economic and organizational resources many organizations need to focus only on their core competencies in order to stay competitive. They find that by taking on too much other activity, they are not exploiting their full potential in their core competencies (Brynhildsvoll & Abrahamsen 2008).

Step 3 – Criteria Statement

An analysis of the need gives a foundation for the criteria for the purchase. It is wise to give potential suppliers an indication of the criteria one have so that they can offer better solutions. The selected criteria should then be guiding in the evaluation of incoming offers. It can also benefit the evaluation if the criteria are weighted in this stage. (Brynhildsvoll & Abrahamsen 2008)

Step 4 – Determining Procurement Procedure

If step 3 concludes that a purchase is necessary, the next step is to determine what procurement procedure the purchase should follow. Pure tender purchases and purchase after negotiation are two main principles. Depending on the type of product and market,

variations of these are sought. In tender processes the purchaser controls the information that the suppliers in the tendering process receives, and the each supplier are not acknowledged with the others starting point. The exception is when the purchase happens through a spot market where the tendering principle works because the markets are virtually the same as free markets. (Brynhildsvoll & Abrahamsen 2008)

Step 5 – Technical and Commercial Specification

The specification step determines what will be purchased. Information from the end customer and other specialists concerning the product is needed in this regard. Specification entails a description of the product up for purchase or the solution the organization is in need for. While one part usually concerns technical attributes of the product, another part specifies to suppliers what commercial conditions that are wanted. The specification constitutes the entire foundation for the purchase and therefore has great implication for the final result. Information that is defined in documents at this stage will form the basis for the contract between seller and buyer at a later stage. The specification step also has great implications for the way the supplier market can be exploited. Too great detail leaves the supplier with little opportunity to use his own competence and experience. And if one is going to negotiate on a basis where all the details are already set, only one negotiation factor remains, and that is price. Brynhildsvoll & Abrahamsen (2008) recommend that a standard or function based specification should be used instead. If such can be used for several purchases it saves both time and money. Also it leaves the supplier with an opportunity to present cost efficient solutions the buyer would not know about otherwise. Standard and function based specifications leaves many negotiation terms, and one does not commit to a final supplier early in the purchasing process. If early supplier involvement is needed or preferred though, the purchaser will have to keep a tight control so the supplier does not dictate the specifications according to his on preferences. (Brynhildsvoll & Abrahamsen 2008)

Step 6 – Supplier Market Search

In step 6 it is time for the organization to search for a supplier. Being updated on potential suppliers is a central task in the purchasing function. Such an overview can be gained through databases, lists, or experience about the market. The type of purchase also has implications for the supplier selection. With new purchases it is necessary to search for new suppliers. But if the purchase is repetitive one usually have a list of approved and

preferred suppliers, though in some cases it could be beneficial to send requests to new actors to test the market. With high value purchases it is natural to send a request to both new and known suppliers. (Brynhildsvoll & Abrahamsen 2008)

Step 7 – Request for Purchase

The next step of the process is to issue a request for purchase to several suppliers so an offer for the purchase can be received. A request should give information about the need that wants to be covered and the terms of the delivery. The purchaser should issue enough requests to secure a competitive offer. How many suppliers that need to be approached to secure this will vary. The request should in any case be formulated in such a way that each supplier is given equal opportunity to meet the demands in the request. (Brynhildsvoll & Abrahamsen 2008)

Step 8 – Evaluation of Offers

When the offers have been received from each supplier the next step is to review and evaluate them. This is done by comparison and data analysis. If a certain way of evaluation is planned, this should be communicated to the suppliers in forehand. Having a similar evaluation format for each supplier will also make comparison easier and more transparent. In the evaluation stage it is important to separate between economic factors and factors concerning the properties of the solution. While the investment cost in one option is higher than another, the operating costs may be lower. One should therefore calculate the net present value for all costs throughout the product lifetime, and thereby get a complete and comparable economic basis for all offers. Evaluating properties is more challenging as they cannot always be compared in an objective way. Demand specification, delivery and payment conditions should also be evaluated and be in terms with the demands from the issued request. (Brynhildsvoll & Abrahamsen 2008)

Step 9 - Negotiations

Negotiations are particularly applicable for technical purchases, but are not always necessary. They demand both time and money, and are therefore most necessary for purchases involving great risk and uncertainty. Negotiation can be for both technical and commercial conditions. (Brynhildsvoll & Abrahamsen 2008)

Step 10 – Preparing Purchase Order

Information and documents produced in the previous steps of the purchasing process forms a foundation for the purchase order that will be prepared in step 10. When the purchase order is approved by the supplier is becomes a legal document and contract for delivery of goods in reliance to the specifications in the agreement. (Brynhildsvoll & Abrahamsen 2008)

Step 11 – Following up Agreement with Suppliers

The next step is following up the agreement made with the supplier. This becomes relevant when the purchasing organization experiences delays that will have an impact on their operations or other conditions that violates the agreement. The purchasing function will usually be in charge of keeping an eye on delivery dates, while technical functions is responsible for seeing through technical conditions. (Brynhildsvoll & Abrahamsen 2008)

Step 12 – Receiving the Order

Step 12 of the purchasing process is when the purchasing organization receives the products from the supplier and controls and accepts them. The products need to controlled for quantity, damage and other terms of the order. More complicated purchases may also go through a test-period before they are finally accepted and approved. Discrepancies in the reception control should further be used as input in evaluation of a supplier's delivery precision and quality. When the goods are received and approved and the invoice is controlled according to the order it is time for the purchasing organization to pay. For larger purchases a part of the total payment may already been given to the supplier as a prepayment. This is a good way of balancing risk in many cases. (Brynhildsvoll & Abrahamsen 2008)

Step 13 – Following up Warranty

The final step of the purchasing process is following up the warranty. A warranty should secure a correct delivery, secure that the supplier's information in the offer is correct, compensate the purchaser if there are discrepancies in the delivery, and regulate the compensation. It is therefore important to tie the warranty to the offer from the supplier so that mistakes in the received goods have economic consequences for the supplier and not the customer. The purchaser should keep track of warranty and its expiration dates. The

purchased product can then be tested in advance so that a potential complaint can be issued in time. (Brynhildsvoll & Abrahamsen 2008)

As figure 2-2 illustrates the first steps of the process are the most influential in terms of costs. The part of the process which is termed as the decision process actually accounts of 80 % of the expenses. It is the most demanding part of the process, and a lot of time and effort should be given here to secure the best possible outcome. Managing the purchasing process entails planning and defining resources, and ensuring quality of critical success factors. The presented process though is only a main principle for purchasing. In certain cases, like for smaller purchases, simplifications are often made as the purchase is less strategic and demands less consideration (Brynhildsvoll & Abrahamsen 2008).

2.1.3 Interaction between the Purchasing Function and other Functional Units

There are usually many members of an organization that contribute to the purchasing decision, and a long list of variables affect what one can call industrial buying behavior. Some of the most important ones are:

- Properties of the product
- The strategic significance of the purchase
- Economic consequences of the purchase
- Properties of the supplier market and implications for risk exposure
- Whether the purchase will affect customers and internal routines
- The purchasing function's role, competence and responsibility

(Brynhildsvoll & Abrahamsen 2008, Van Weele 2010)

Van Weele (2010) has made a matrix that categorizes four decision scenarios in purchasing. As more adaptation is required within the organization, more functional disciplines will be involved in the purchasing decision, and the decision-making process will be more complex. Two dimensions are particularly important in deciding on a purchase: product complexity and commercial uncertainty. Figure 2-3 shows the typology of purchasing situations where product complexity and commercial uncertainty is both high and low. For instance a product that is customized, technically complex, have high investment and long-term impact is a purchase that require cross-functional decision

making. At the same time, a product that is standard, technically simple, have limited investment and short-term impact is a purchase the purchasing department can decide without involvement of others.

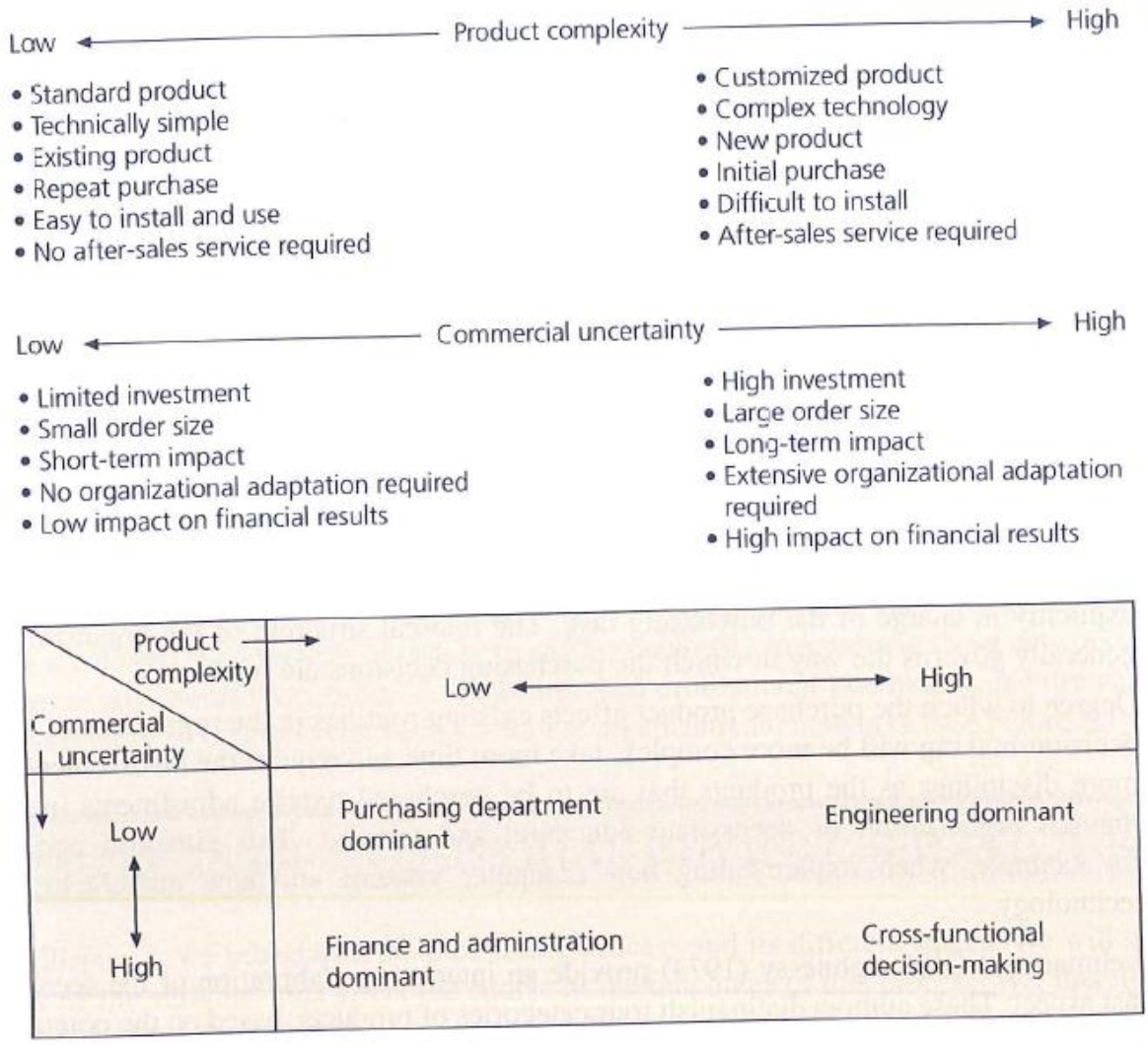

Figure 2-3: Typology of purchasing situations (Van Weele 2010)

However, interaction between functional units demands collaboration and information sharing. The next section will elaborate the information needs in purchasing activity.

2.1.4 Information Needs in Purchasing Activity

The need for information is contextual. Its quantity, content, and processing requirements are all dependent on the situational requirements. Information needs regarding a particular functional unit in an organization is similarly dependent on the very nature of that function. The importance of the decision outcome to that function, but also to the organization is of particular interest (Lau et al. 2003).

The purchasing tasks of this study are related to industrial purchasing. As pointed out by Lau et al. (2003), decisions in industrial purchasing often require a significant amount of information on organizational needs, alternative products and suppliers. This is due to the technicality of industrial purchasing, and the inherent risks and costs involved. The information required can be found both outside and inside an organization. External sources of information involve contact with suppliers, customers etc. Internal sources of information involve other functional units, evaluations of past experiences from colleagues etc. (Lau et al. 2003).

Information in purchasing is used to increase certainty and reduce the risk related to a purchase. The more risk that is involved in a purchase, the greater is the extent of information sought. Using different sources of information also increases with the risk inherent in the purchase. Personal sources of information are used the more complex a purchasing situation is. Such sources include supplier representatives, and talks with colleagues and customers about their recommendations and warnings. "Word of mouth" information may play a significant role when a decision process is characterized by uncertainty. Impersonal sources of information are often viewed more valuable when the perceived risk is little, and these sources are able to provide useful information about possible purchases. The product up for purchase is then easy to evaluate before a decision is made. Sources of impersonal information include sales literature, print advertisements in trade publications, supplier catalogues, direct mail, and government or industry rating agencies. The more expertise and experience an industrial purchaser has, the more he tends to use impersonal sources of information, in comparison with a less experienced purchaser (Bienstock & Royne 2007).

An important facet of information search in decision making is that a decision-maker will only search for information as long as the costs of doing so do not exceed the benefits. In the context of industrial purchasing, the more an information search reduces uncertainty and provides the purchaser with useful information, the more he will be able to successfully perform his purchasing tasks (Bienstock & Royne 2007). Still, as a result of both inadequate information and scarce competence, buying behavior is in many cases limited rational (Brynhildsvoll & Abrahamsen 2008).

2.1.5 Purchasing Performance

Van Weele (2010) states that purchasing performance can be evaluated by the degree to which the purchasing function achieves predetermined goals with a minimum use of an organization's resources. Two metrics are important in this respect:

- Purchasing efficiency which is related to the resources which are required to realize the previously established goals and objectives and related activities. The relationship between planned and actual costs is the essence.

- Purchasing effectiveness which is the extent to which activities fulfills previously established goals or standards. In contrast to efficiency this relates to the relationship between planned and actual performance of any human activity.

While these two performance measures may be calculated, evaluated and give a good indication of purchasing performance that is out of scope for this study. Purchasing performance in this study will be related to an organizations ability to successfully fulfill its purchasing activities, and for that information is crucial. As stated in the introduction, information is a key force in organizational performance, and therefore assumable purchasing performance.

2.2 Intra-Organizational Information Sharing

There are many definitions of information in the literature. According to Gottschalk (2004), information is *processed data that turns into knowledge when combined with experience, context, interpretation and reflection.*

As the definition suggests, there is a close relationship between information and knowledge. The literature field has often used the terms information and knowledge interchangeably. While some researchers choose to distinguish between them, others view them as equal (Teimouri et al. 2011). With the use of Gottschalk's definition, this study will also recognize that there is a difference between the two terms information and knowledge. And pure information does not characterise as knowledge before is paired with experience, context, interpretation and reflection. However, the information term throughout this study will take on a broad meaning. Information in the context of this study refers to information that is context specific and that is paired with experience, interpretation and reflection. The reason for this is that the purpose for investigating information in this study is to use the information in purchasing activities and for improving purchasing performance. When information is used for this type of purpose it is sometimes hard to separate from the knowledge term. Therefore the terms information and knowledge will be used somewhat interchangeably in this thesis. When the information term is used, knowledge is part of it. And when the knowledge term is used, information is part of it.

Information sharing simply refers to the act of making information available to others within the organization (Teimouri et al. 2011). Kim & Lee (2006) define employee knowledge-sharing capability as *the ability of employees to share their work-related experience, expertise, know-how, and contextual information with other employees through informal and formal interactions within or across teams or work units*. This also refers to employees' ability to acquire knowledge that is held by other divisions within the organization.

The introduction of this thesis highlighted the organizational value of information. Taking advantage of the value of information though is dependent on it being shared among individuals. Sharing information and knowledge is imperative as it connects the individual

and the organization by transferring information and knowledge that resides on the individual level to the organizational level. It is when information and knowledge is established on the organizational level it is of economic and competitive value to an organization. When people with different information and knowledge skills collaborate, they are able to achieve a level of competitive advantage higher than any individual could achieve on their own (Teimouri, Emami & Hamidipour 2011).

2.2.1 Factors affecting Intra-Organizational Information Sharing

There are several factors that have been identified in the literature as affecting information within an organization. Such factors are both those who facilitate and motivate sharing, but also those who act as barriers to sharing.

Yang & Maxwell (2011) point to various factors that can influence intra-organizational information sharing, shown in figure 2-4. The figure is built so that the outer layers influence the inner ones. Organizational structure and organizational culture, ritual and norm encompass the outer layer of the figure. These elements all have a broad impact on the activities of an organization. Absorptive capability of information, information technology, characteristics of information, system of reward and incentive, power games, social identity, social network, and trust are factors on the second layer of figure 2-4. These factors are influenced by organizational structure and organizational culture, ritual and norm, and influences in turn member's beliefs in intra-organizational information sharing. The third layer of figure 2-4 is the organizational member's belief in intra-organizational information sharing and is influenced by layer 1 and 2. However this layer can also be developed and mediated by self-interest and cost-benefit analysis, information ownership or information stewardship, and reciprocity (Yang & Maxwell 2011).

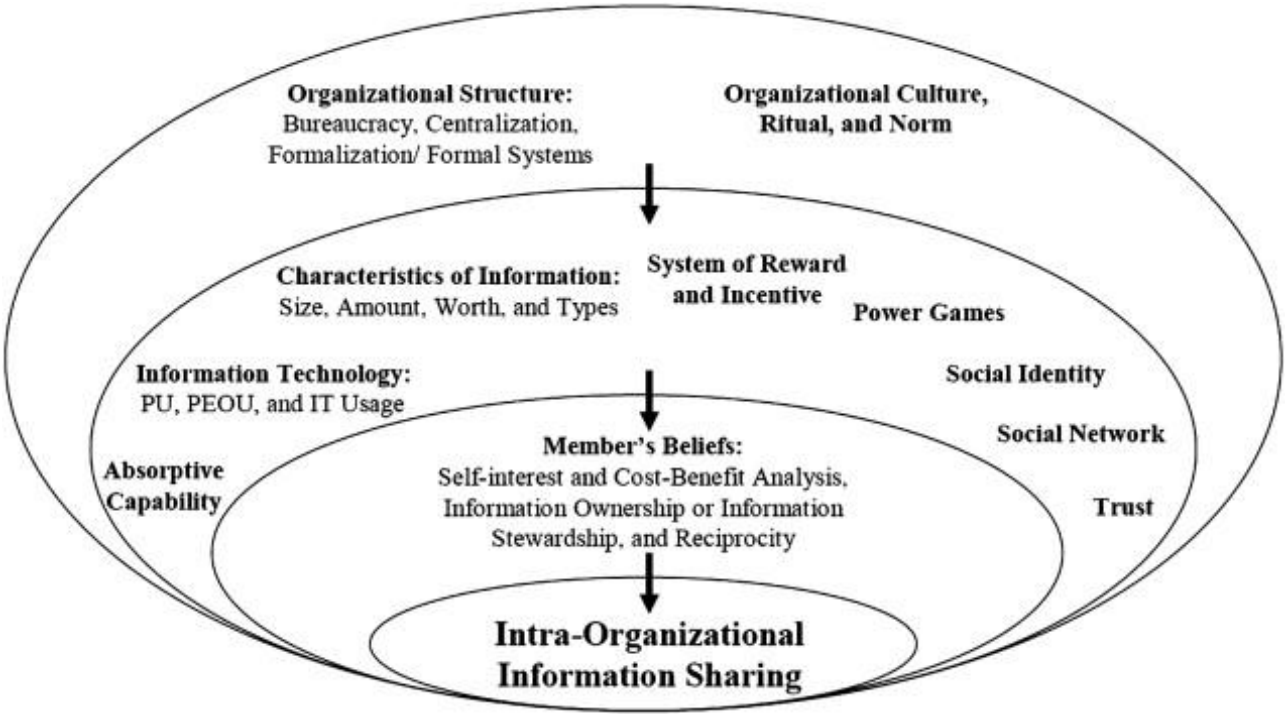

Figure 2-4: Factor affects intra-organizational information sharing (Yang & Maxwell 2011)

The literature framework for this study will use the theory of Yang & Maxwell (2011) as a starting point. They have developed an extensive view for how information sharing happens within an organization. However, as there are different explanations in the literature of how these factors affect intra-organizational information sharing, different views and findings will be presented accordingly. It is important to note that the literature field has different perceptions as to whether the factors in figure 2-4 affect intra-organizational information sharing directly or indirectly. The relationship structure in the figure is therefore not the rule for this study, but rather a starting point for the review.

Layer 1

Organizational Structure

Organizational structure is a major factor affecting intra-organizational information sharing (McNeish & Mann 2010, Kim & Lee 2006, Tsai 2002, Yang & Maxwell 2011). Organizational structure impacts the division of labor, distribution of decision rights, choice of coordinating mechanisms, definition of organizational boundaries, and networks of information relationships (McNeish & Mann 2010). The organizational structure

determines the degree to which information and knowledge can be harnessed, shared, and integrated amongst units and employees. Organizations should therefore seek to support formal structures that encourage information flow among its members.

Information required for effective management of an organization is owned by different parities within and outside the organization. When individuals are seeking advice and collaboration they are likely to turn to their formal networks. Positions in a network reveal those that have similar information needs and uses, and also who ultimately controls, facilitates, or inhibits information (Hatala & Lutta 2009).

According to Tsai (2002), coordinating different units to share information is critical to improving an organization's capabilities. To expand the knowledge base and exploit economies of scope for business operations, organizational units have to cooperate with each other and learn from each other. If units of an organization possess unique information that other units could benefit from, the way an organization coordinates the different units affects information sharing. Tsai (2002) suggest that hierarchical structure is an important coordination mechanism of information and knowledge sharing. Coordination is achieved through vertically imposed bureaucratic processes. In his study of large multi-unit organizations, Tsai (2002) found that centralization as a way of coordinating information worked against its purpose. In fact, it resulted in inefficient information sharing. The reasons behind this are that centralization imposes a number of costs to the organization. First of all, there is a tendency of headquarters to intervene excessively or inappropriately. Second, time and effort dedicated to influencing activity increased with a corresponding reduction in organizational productivity. Third, it led to poor decision making due to the distortion of information associated with activities to influence. And fourth, efficiency decreased when the organization had to adapt structure and policies to enhance control activities. According to Tsai (2002), organizations should therefore reduce hierarchical constraints as a means of enhancing the level of information and knowledge sharing. However, these findings are not consistent with all literature findings. Some researchers (according to Tsai 2002) promote that centralization gives direction, coordinates and integrates. Centralization refers to the degree to which power and authority is concentrated at the organization's higher levels (Kim & Lee 2006).

Formalization is identified as an antecedent of organizational structure. It refers to the degree to which organizational activities are manifested in written documents such as formal rules, guidelines, procedures, and regulations. Formal systems have been found to be less effective than informal systems in facilitating information and knowledge sharing. Informality fosters flexibility, openness, increased communication and interaction. Coordination mechanisms such as teamwork and personal networks has the ability to promote a greater degree of information sharing than formalized processes specified by rules and regulations (Kim & Lee 2006, Yang & Maxwell 2011). However it should be noted that both Kim & Lee (2006) and Willem & Buelens (2007) claim that formalization is not the main obstacle to information sharing within an organization, other factors are more critical.

Geographical structure of an organization may also pose as a factor affecting information sharing. Geographic locations allow for interaction, and two units operating in the same geographic area are more likely to share information (Tsai 2002). Further, rigid organizational structures such as departmentalization may pose as barriers to information sharing due to different mandates, processes, and expectations (Willem & Buelens 2007, Yang & Maxwell 2011).

Organizational Culture

The main driver of information and knowledge sharing is the members of an organization. It is difficult for a pure technology based solution to ensure effective information flows among organizational members. Factors such as power, politics, and culture cannot be regulated through technical applications (Barua et al. 2007). Organizational culture has been identified by many researchers as one of the major factors affecting information within an organization (Barua et al. 2007, Hatala & Lutta 2009, Hsu & Wang 2008, Kim & Lee 2006, Yang & Maxwell 2011). An important challenge is therefore to create an organizational culture that enhances the member's information sharing capabilities. Some business environments and organizational cultures are more hostile to information sharing than others (Michailova & Husted 2004).

According to Yang & Maxwell (2011), organizational member's attitudes and collective actions to share information are influenced by organizational values, norms, and cultures. An organizational culture that highlights fairness, affiliation, and innovation, is more likely

to promote information sharing. If solidarity, mutual interest, and shared goals are at focus, the members will tend to hold stronger beliefs of organizational rather than individual ownership of information, and hence information is shared. If information is not emphasized as a value within the organization, the culture will also not promote it, and the culture may act as a barrier to sharing. The goal for an organization should be to make its members value information as an economic resource (Hatala & Lutta 2009).

Hsu & Wang (2008) have found that top management values help shape the organizational culture. Top management support enablers are considered intra-organizational facilitators for information sharing and quality information. Top management has a role of providing vision, guidance, and support in information sharing. And their support is needed to overcome the reluctance of information sharing and to foster an organizational culture of information sharing (Li & Lin 2006). When management views information and also knowledge as a source of competitive advantage, they also support practices directed at facilitating information and knowledge sharing within the organization. Encouraging information and knowledge sharing is a way to emphasize that this is a key strategic resource (Hsu & Wang 2008).

In a study of a closed information environment Choo and Hooper (2009) also found that management played a major role in creating an information and knowledge sharing environment in the workplace. They suggest several mechanisms the management could put in place to promote this. First of all, management must ensure that guidelines, policies and procedures surrounding knowledge and information sharing are clearly formulated and proactively promoted. A possible reward system must acknowledge information and knowledge sharing, emphasizing that information and knowledge is seen a source of power and strength. They must ensure that all input is recognized and judged based on merit rather than personal source, and make place for informal exchange of information and knowledge through for example mandatory weekly employee luncheons or social meetings after working hours. Lastly the management must lead by example, and not simply think that an information and knowledge sharing culture will emerge without a strong commitment throughout the organization (Choo & Hooper 2009).

Another aspect of the organizational culture that affects information sharing is perceived equity among individuals. Lack of perceived equity makes sharing difficult. Individuals

will likely not share information if this result in loss of power and influence. Employees may view loss of exclusivity as a cost of sharing information. Individuals pose different levels of information and knowledge, and those with higher levels of expertise are more likely to believe that others could not provide right information. Individuals with less expertise on the other hand are likely to believe that the information given will solve their problems (Hatala & Lutta 2009).

Layer 2

Absorptive Capability

Absorptive capability refers to the ability of an individual, group, or organization to recognize the value of new information and to integrate and apply it to practical and innovative use. Such ability is dependent on prior information and knowledge, member's capacities, and the transfer of information and knowledge across organizational subunits. Different members and units have different information and knowledge resources. A high level of absorptive capability means that the members or units of the organization are capable of receiving and using information and knowledge transferred from other sources in the organization. If information and knowledge is frequently transferred between two parties, their common knowledge will increase (Tasi 2001, Yang & Maxwell 2011). Inter-unit links are important for the learning process within the organization, for discovering new opportunities and obtain new information and knowledge. Sharing resources related to information and knowledge also gives the opportunity of pursuing synergy among departments and functional units. Realization of such synergy benefits depends on how effective the linkages between the parties are (Tasi 2001).

Lack of absorptive capability may act as a barrier to information sharing within an organization (Tasi 2001, Yang & Maxwell 2011). For instance, lack of common knowledge may frustrate a party in making an effort to transfer knowledge to another party (Yang & Maxwell 2011). Tasi (2001) suggest that R&D investments will help the creation of absorptive capability as absorptive capability results from a long process of investment and knowledge accumulation.

Information Technology

Information technology is identified as one of the most important factors affecting intra-organizational information sharing (Barua et al. 2007, Hatala & Lutta 2009, Kim & Lee 2006, Li & Lin 2006, Yang & Maxwell 2011). Sharing information in the organization requires storage and retrieval mechanisms for quick and easy access to information that is used for adjusting strategic direction, problem solving, and improving organizational efficiency (Kim & Lee 2006). Information technology (IT) affects information sharing positively when it enables an organization to share information timely, accurately, and reliably. It then opens up new possibilities for increasing value through information sharing (Li & Lin 2006).

Due to a high pace, competitive pressure, many organizations have invested heavily in IT to overcome the barriers of information sharing in an organization (Barua et al. 2007, Hsu & Wang 2008). Investing in IT is no longer seen as merely a cost of doing business, but is viewed as a resource that offers strategic advantages for an organization. Organizations today need information systems that are aligned with the needs of the business and that are responsive to strategic and competitive pressures and more cost-effective in offering solutions (Kolekofski Jr. & Heminger 2003). Applications such as Enterprise Resource Planning (ERP), corporate intranets, and Enterprise Information Portals (EIP) enable organizations with the possibility to share information across business processes and value chains. ERP systems integrate and standardize business processes and information flows across an organization. Corporate intranets enable cost efficient infrastructures for different information sharing applications. EIPs provide data to internal users according to unique information requirements in their work setting. However ERP applications, intranets and EIPs do not provide optimal levels of information sharing on their own. They only offer technological platforms for facilitating information sharing (Barua et al. 2007).

It is the management's responsibility to review the properties of the technical systems, and ensure that these are fast and easy to use, and are designed to prevent overload of information. The technical systems must have the ability to speedily extract necessary information, prevent certain information from being accessed by unauthorized staff, and provide evidence of information currency, accuracy and completeness. The last can be done by providing dates of contributions and comments from users as to the usefulness of, or problems with the information (Barua et al. 2007).

Goodman & Darr (1998) emphasize that it takes both time and effort for employees to use IT systems to contribute to organizational information sharing. The perceived usefulness and user-friendliness influence whether they accept the information systems to its full use. If implemented information technology is not user-friendly, IT usage within the organization will be lower and information sharing is negatively affected. Designing an information system that precisely addresses user needs is therefore one of the most significant factors affecting information system success (Kim & Lee 2006, Yang & Maxwell 2011). Choo and Hooper (2009) emphasize the need for training with regard to the relevant policies and the use of the technical systems among the employees. This training should be mandatory and continuous with regular refresher courses. Employees have varying IT resources and skills. Barua et al. (2007) suggest that it is important to ensure that the information processing capabilities of different workgroups are comparable. This will increase information sharing capability within the organization.

McNeish & Mann (2010) point to three major constraints in the use of information technology in knowledge sharing:

1. Information technology cannot obtain the knowledge embedded in social networks
2. Information technology does not allow face to face interaction important for knowledge exchange and informal settings that is important for knowledge creation
3. Information technology permits electronic exchange, however it does not automatically induce a willingness to share information and knowledge and build new intellectual capital

It should also be noted that technology is less effective for sharing of tacit knowledge (McNeish & Mann 2010). Marouf (2007) states that most information systems have failed to capture valuable private knowledge crucial for innovation. Such knowledge cannot be codified and face-to-face interaction is needed for transference.

Characteristics of Information

The size, amount, and perceived value of information can influence individuals' attitudes and intentions to share it (Kolekofski & Heminger 2003). Researchers separate between two types of knowledge that matters in information sharing, namely explicit and tacit.

Explicit knowledge is objective and rational and can be expressed in words, numbers, formulas, or charts. It can be termed as codified as it can be produced adequately in documents. Tacit knowledge is subjective, experience-based, and difficult to express and communicated, due to this is can be termed as non-codified. It takes time to learn and explain, and include elements such as insights, intuitions, and beliefs that are tightly intertwined with the experience of the knowledge source. In terms of knowledge sharing, the explicit knowledge is easier transmittable, and when it is tangible to others it can be termed as information (Kim & Lee 2006, McNeish & Mann 2010, Yang & Maxwell 2011).

Information and knowledge can exist both on the individual and the collective level. When knowledge resides at the collective level it is more easily shared among organizational members. However, when the individual acquire new information and knowledge, it is more difficult for other individuals to access this (Hatala & Lutta 2009). For sharing knowledge that exists at the individual level within an organization, Kim & Lee (2006) have identified three mechanisms:

1. Sharing knowledge in interactions among employees
2. Sharing knowledge with other employees in teams or groups
3. Acquiring knowledge held by other divisions

System of Reward and Incentive

The use of performance-based reward systems positively affects employees to share both information and knowledge (Kim & Lee 2006, Yang & Maxwell 2011). It motivates organizational members to generate new information and knowledge, share existing information and knowledge, and help people from other departments or functional units. The main purpose of having reward and incentive systems is to foster involvement and communication among organizational units, and to collect, process, and deliver information on the performance of organizational units, activities, processes, products (Kim & Lee 2006). Reward and incentive systems may also have the capability of enhancing the quality of shared information (Yang & Maxwell 2011), and reduce the risk of opportunistic behavior (McNeish & Mann 2010).

According to McNeish & Mann (2010), information and knowledge sharing can also be stimulated through the use of incentives such as performance evaluations, feedback, goal setting, and ongoing measurement. Such incentives will then work better for codified information and knowledge, meaning information that can be verified separately from the person conveying it. Kim & Lee (2006) also note this. They have found that if managers provide periodic formative feedback on work accomplishments and give fair performance evaluations, they may guide the employees in actions for obtaining specific knowledge. Managers may also introduce employees to specific communities of practice associated with the knowledge needed in their job (Kim & Lee 2006).

However, systems of reward and incentive can act as a barrier to information sharing if these systems are not specifically designed to enhance information sharing (Yang & Maxwell 2011).

Power Games

Power games are situations where individuals or units within an organization use unjust power to increase value or influence (Yang & Maxwell 2011). Having information is often seen as a source of power in organizations (Kolekofski & Heminger 2003). However, viewing information as an asset may impede information sharing if sharing is seen as a loss of individual power and social influence. And the more power games that exists, the less information is shared (Yang & Maxwell 2011).

Social Identity

When a group of people share the same belief, symbol, attitude and behavior, they are more likely to contribute to the collective good. Contributing is then seen as a way for them to maintain and share their identities with the organization. Employees with strong social identification are therefore more disposed to make sacrifices that benefit the whole, and hence they are more likely to share information (Yang & Maxwell 2011).

Social Networks

Social networks are important premises for information and knowledge sharing within an organization (Argote et al. 2003, Kim & Lee 2006, Kolekofski & Heminger 2003, Yang & Maxwell 2011). A social network can be defined as a subset of established informal relations that exists within teams and across subunits in an organization (Hansen et al. 2005).

Information sharing in a social network refers to sharing through communication, dialogue, individual and group interaction. While formal networks and relationships are important in information sharing, the informal networks are important as well. And for the purpose of knowledge sharing, informal networks are claimed to be of greatest importance. Individuals often tend to rely more on informal relationships for communication (Kim & Lee 2006).

Social networks are a voluntary and more personal mode of coordinating information, and are important as they move information across functional units. Inter-unit interaction is an important parameter for fostering new ideas as it gives more opportunities to share resources and thus increase information and knowledge flows (Tasi 2001). Although social networks are naturally formed, the management can encourage it by arranging social events. That way interaction between organizational levels and units is fostered. The more informal relations that are present in an organization, the more channels exist for information exchange between members and the more they can access each other's resources (Kim & Lee 2006). Kim & Lee (2006) present social networks built around specific topics of interest as a possible measure in increasing information sharing. These networks may cross functional boundaries and thereby access inter-unit information and knowledge. Likewise, mentoring programs may be used to build practice communities that facilitate information and knowledge sharing among employees.

Relationships between organizational members could also act as a barrier to information sharing (Hatala & Lutta 2009). In order for the social networks to act as proper coordination mechanisms for information flows, these relations should be characterized by trust. If not, cooperation is not optimal (Tsai 2002). This topic will be presented next.

Trust

Trust is another factor that may affect information sharing within an organization (Kim & Lee 2006, McNeish & Mann 2010, Yang & Maxwell 2011). Trust is a substitute for the ability to monitor and verify information. It is reflected in the control and coordination systems, and the use of incentives to influence behavior. Higher levels of trust demand fewer control mechanisms, and lower transaction costs incurred by the organization. Legal and regulatory structures may be reduced and the organization can take on a more adaptive, efficient, and responsive form. When trust exists in a relationship it strengthen the relationship, and creating trust is seen as a means of avoiding opportunistic behavior. It is claimed that people are more willing to accept information and knowledge that resides from someone they trust. Trust has the ability to influence information sharing directly and indirectly through relationships and culture (McNeish & Mann 2010).

Relationships that are characterized as loyal and trusting, deviate from deception, cheating, and blaming other for failure. Such relationships are most likely to foster active information sharing as trustworthy behavior enhances communication. Trust among organizational members, can lead to better information and knowledge sharing, shared goals, and lower transaction costs. When trust is not present in a relationship, formal information sharing efforts are insufficient and a barrier to sharing is present (Kim & Lee 2006, Yang & Maxwell 2011). Individuals are only disposable to sharing if they feel that they are protected against opportunism (Yang & Maxwell 2011).

The characteristics of information is determining for the level of trust required. For explicit knowledge trust is less important as such information is transmitted through written documents etc. It can also be understood separate to the source and independently verified. Tacit knowledge however, is personal knowledge based on individual experience and values. Hence, the trust element holds more leverage (McNeish & Mann 2010).

Relationships with repeated contact and that are consistent with positive outcomes, builds long-term commitment, cooperation, and the willingness to take risk. This will ultimately create trust in the relationship (McNeish & Mann 2010).

Layer 3

Member's Beliefs

The organizational member's beliefs about information may affect their information sharing behavior. If they perceive information sharing as a cost their beliefs will act as a barrier. Costs of sharing information include time and effort spent articulating, preparing and arranging information, risks of having to clarify and assist further at the cost of own time and resources, and the fear of criticism if information is inaccurate or irrelevant. If the benefits of contributing are unclear, the reluctance of doing so tends to be high. Each individual have their own cost- benefits analysis as to whether or not share information (Yang & Maxwell 2011).

Information sharing may present a social dilemma. The dilemma is whether personal interests are consistent with collective interests. Information such as the expertise of individuals is a personal resource, and sharing it is more difficult than if it were something like a product that is an organizational resource. Sharing information about expertise is dependent on the members' attitudes to whether or not the organization has ownership of their information and knowledge. If the management were to improve information sharing in the organization they should therefore foster a belief in organizational ownership of expertise information (Kolekofski & Heminger 2003, Yang & Maxwell 2011).

Reciprocity is an important driver in information sharing, and if organizational members anticipates that their sharing behavior will be reciprocated this will have a positive effect on their attitude towards sharing (Yang & Maxwell 2011).

2.3 Merging Literature on Purchasing Activity and Intra-Organizational Information Sharing

The theoretical framework has presented a number of views on what factors affect intra-organizational information sharing and how they do so. But are these applicable in a purchase setting as well? Are they valid in purchasing activity and for improving purchasing performance? Information needs regarding a particular functional unit in an organization is dependent on the very nature of that function, and a case study will give a real-life context for seeking answers. A case study approach will give a ground for investigating whether this will be true. The case study in this research will be in the context of a shipbuilding company. In investigating sharing of purchasing information within a shipbuilding company, the factors will be used as a starting point. The following propositions based on the theoretical foundation will guide the collection and analysis of data:

Propositions:

- P1: Organizational structure affects intra-organizational information sharing for purchasing activity
- P2: Organizational culture affects intra-organizational information sharing for purchasing activity
- P3: Absorptive capability affects intra-organizational information sharing for purchasing activity
- P4: Information technology affects intra-organizational information sharing for purchasing activity
- P5: Characteristics of information affect intra-organizational information sharing for purchasing activity
- P6: System of reward and incentive affects intra-organizational information sharing for purchasing activity
- P7: Power games affect intra-organizational information sharing for purchasing activity
- P8: Social identity affects intra-organizational information sharing for purchasing activity
- P9: Social network affects intra-organizational information sharing for purchasing activity

- P10: Trust affects intra-organizational information sharing for purchasing activity
- P11: Member's beliefs affect intra-organizational information sharing for purchasing activity

Figure 2-5 illustrates the composition of each proposition. The characteristics of purchasing activity affects each information sharing factor which in turn affects intra-organizational information sharing in purchasing activity and for purchasing performance.

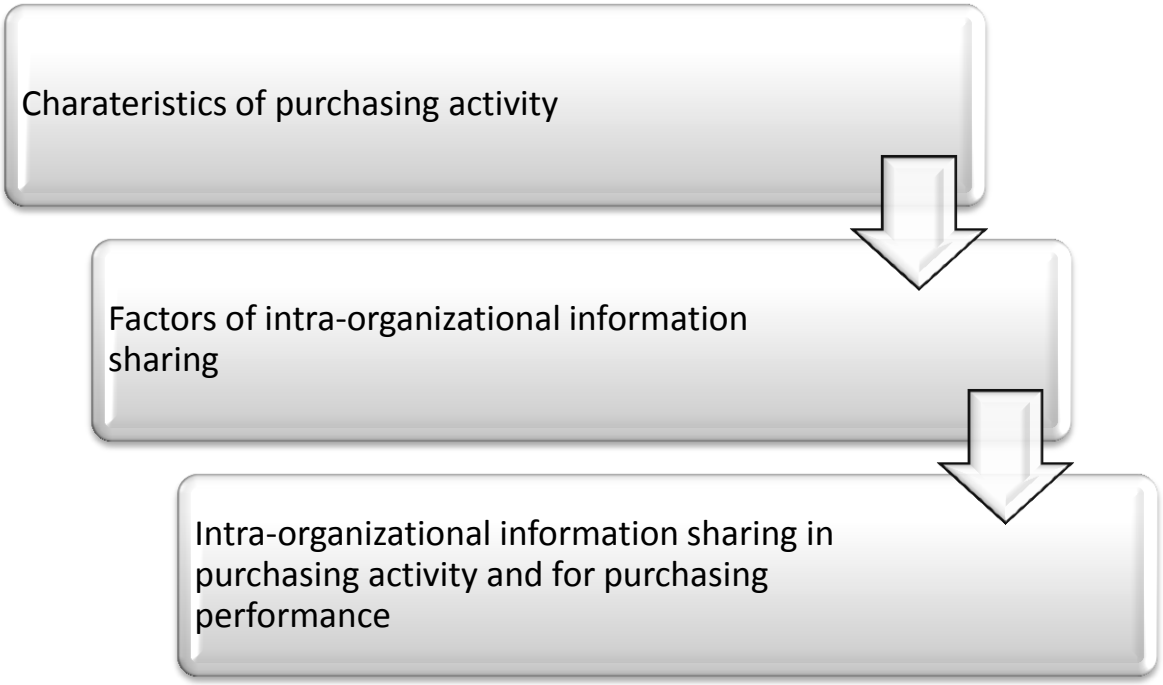

Figure 2-5: Research Model

3 Research Methodology

This chapter presents the research methodology of the study. The purpose of the chapter is to provide explanations for why the particular research approaches have been chosen in the study, and how the research has been conducted as a result of these choices. First the research design will be described, followed by an elaboration of the data collection methods and an evaluation of the quality of the research.

3.1 Research Design

The research design of a study states the conceptual structure at which the research will be conducted. Yin (1994) defines research design as *an action plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions.*

The purpose of the research design is to give a means to obtain relevant evidence through the use of minimal effort, time and money. Achieving this though, is dependent on the research purpose. According to Dhawan (2010), a research purpose can either be exploratory, descriptive, diagnostic, or experimental. The objective of this thesis was to provide insight into the understanding of intra-organizational information sharing in purchasing activities and performance. While there are many contributions in the literature concerning intra-organizational information sharing, there seems to be lacking research on information sharing within specific functional areas of an organization. This study therefore has an explorative nature. Explorative research is appropriate for problems in which the purpose is to gain familiarity with a phenomenon or to achieve new insights into it. An exploratory research requires a flexible research design that allows many different facets of a problem to be considered and investigated (Dhawan 2010). As stated in the introduction, Benbasat et al. (1987) advocates that case research is particularly appropriate for problems in which research and theory are at an early, formative stage. This research has used a case study analysis to find answers to the research questions. The answers could not be found in the literature field alone. Chapter 3.1.1 will elaborate on the case study approach.

This thesis has further used a qualitative approach to investigation. A qualitative research is based on text data and may be based on few units of investigation (Ringdal 2007). Qualitative research tries to disclose the underlying motives of human behavior such as the factors that motivate people to behave in a certain way (Dhawan 2010).

3.1.1 Case study

A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin 1994). It can be defined as an examination of a phenomenon in its natural setting, using multiple methods of data collection to gather information from one or a few entities such as people, groups, or organizations. No experimental control or manipulation is employed and the boundaries of the phenomenon are not clear when the research starts. No a priori specification of dependent variables is needed and the researcher acts as an observer or investigator in the research process (Benbasat et al. 1987).

The main reason for why a case study may be appropriate is that it provides much more detailed information than other methods. In addition a case study allows for data to be gathered from several sources such as surveys, interviews, document review, and observation. There are however some limitations and issues one must be aware about using a case study. First of all, as the researcher gives detailed information the case study may become lengthy and it could be hard to keep the readers interest throughout. There is also a concern that case studies lack rigor. In many cases researchers have not been systematic in their data collection, or have permitted bias in their findings. One should therefore be systematic in data collection and be rigor about the process as to ensure validity and reliability in the study. Thirdly, case studies are often accused of not being generalizable. Many researchers still generalize their studies based on few cases without evidence that this is representative for the population (Neale et al. 2006).

A case study can include both single and multiple cases (Yin 1994). This thesis was based on a case study of the Havyard Group AS as a single case. This particular case was selected as the research problem was discovered in conversation with the CPO of Havyard. The unit of analysis in the study was the purchasing function at Havyard.

3.2 Data Collection Methods

Multiple research methods are usually employed in case studies. The situation will be more ideal if two or more sources converge to support findings. The research questions and the unit of analysis determine which type of data that should be collected. The data material could be collected from documentation, archival records, interviews, direct observations, participant observations and physical artifacts (Yin 1994). Either way, a clear description of data sources and the way they contribute to research findings is important in terms of reliability and validity of the research (Benbasat et al. 1987).

Figure 3-1 demonstrates the data collection framework for the study. Three domains of data collection converge in order to answer the research questions; the case study, literature on purchasing activity, and literature on intra-organizational information sharing. The next few sections will present the primary and secondary data used in the search for an answer to the research questions.

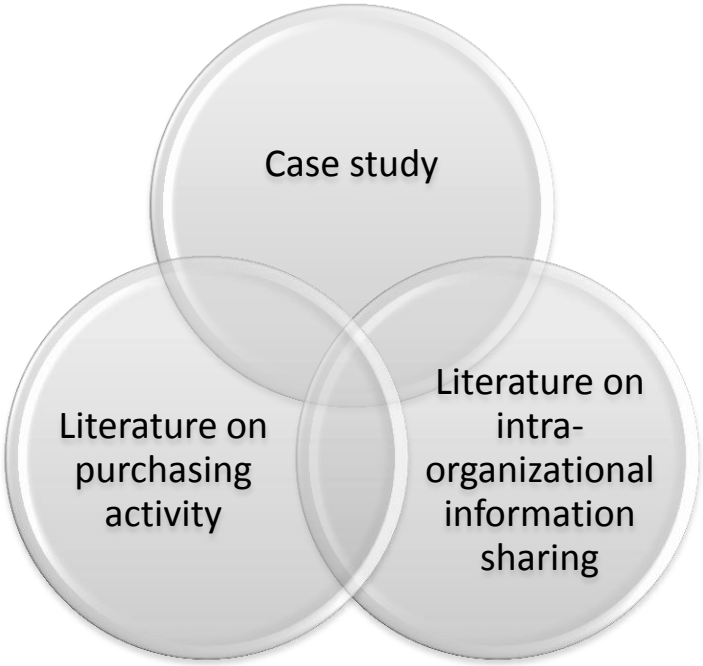

Figure 3-1: Data collection framework for this study

3.2.1 Primary Data

Primary data is data that is collected by the researcher himself or is planned by the researcher for the purpose of the study. It is collected for the first time and is of original character. The most imperative argument for using primary data is therefore that the researcher can tailor data to the research questions. There are several sources of primary data. Some of the most important ones are through observation, interview, questionnaires, and schedules (Dhawan 2010).

The primary data for this study was mainly obtained through interviews with key personnel in the purchasing function at Havyard. The next section will describe how these interviews were conducted and how they contributed to the research.

Interview

Interviews are one of the most important sources of case study information. Since most case studies are about human affairs, well-informed respondents can provide valuable insight to a situation. However, as interviews are subject to common issues such as bias, poor recall, and inaccurate articulation they should be done with caution. It is reasonable to combine interviews with other sources of data (Yin 1994).

There are several ways of conducting an interview. Dhawan (2010) separates between the structured and the unstructured/semi-structured interview. Structured interviews are conducted by the use of predetermined questions and highly standardized techniques of recording. Unstructured/semi-structured interviews have a more flexible approach to questioning. There is no system of pre-determined questions and no standard technique of recording. The researcher may have a framework of themes to explore, and it could be beneficial to have an interview guide prepared that helps to keep focus at the topics one want to cover. The interviewer has the ability to ask supplementary questions or leave out certain questions he first intended to ask. In recording an unstructured/semi-structured interview the researcher also has the flexibility to include and exclude aspects of the responses if these are not relevant for the research. The problem with unstructured/semi-structured interviews is a lack of comparability of one interview with another. The analysis of the responses is also more difficult and more time-consuming. Still, unstructured/semi-

structured interviews are a central technique of data collection in the exploratory case study (Dhawan 2010).

A total of three interviews were conducted throughout the course of this study with three different purchasers. The CPO at Havyard became a key informant for the study. As stated by Yin (1994), the more active a respondent is in providing facts, opinions, or insights about events and occurrences, the more he acts as an informant. Key informants are often critical to the success of a study. However one should be cautious about becoming overly dependent on them due to interpersonal influence. The first and last interview was with the CPO. These interviews were conducted at the main office in Fosnavåg. The second interview was with two purchasers at the yard site in Leirvik, one of these respondents were the purchasing manager at that site. The questions asked were of an unstructured/semi structured nature as the purpose was to gain as much insight into intra-organizational information sharing for purchasing activities and performance as possible. As already stated the research purpose was of an explorative nature so structured questions could have caused a too narrow focus, missing out on important contributions to the research. All of the interviews were recorded by the use of transcription and relevant information from theses interviews is listed in Appendix 1-3. The next three sections will explain more about the course of these interviews and how they contributed to the research.

First interview

The purpose of the first interview was to get a general overview over information flow within Havyard and especially the purchasing function. Interaction between the different functional units was of particular interest. The idea was to have an informal conversation on how information interaction was perceived within the company. During the interview it was discovered that intra-organizational information sharing was a challenge for purchasing and it was determined that the focus of the research from this point forward would be on information sharing within the organization. The findings of the first interview that became relevant for this study are cited in Appendix 1.

Second interview

The objective of the second interview was to get an overview over the information needs in purchasing, what factors that affects intra-organization information sharing in

purchasing activities and the inherent challenges of sharing. The findings of the second interview that became relevant for this study are cited in Appendix 2.

Third interview

The objective of the third interview was to map information flow and reveal information sharing difficulties in the purchasing process. Initially the idea was to focus on one particular product and the characteristics inherent in this particular purchase. However during the interview it was discovered that a more generic description of the purchasing process would better highlight the challenges related to information sharing. The information challenges disclosed during the interview was not tied to a specific purchase, and therefore that approach would be misleading. The findings of the second interview that became relevant for this study are cited in Appendix 3.

3.2.2 Secondary Data

Secondary data are data that have already been collected by someone else and been passed through the statistical process (Dhawan 2010). The secondary data for this study was mainly retrieved from specialized journals related to disciplines such as organization, management, and information sciences. These were accessed through the use of the databases Google Scholar, ProQuest and Science Direct. The objective was to collect, organize, and synthesize existing knowledge relating to intra-organizational information sharing and purchasing activity. Other sources of secondary data used in the study include teaching books and documentation received from Havyard. The documentation received from Havyard was extract of their guidelines in conducting a purchase and also a graphical display of their purchasing process. These are to be found in Appendix 4 and 5. A presentation Havyard used for a group of students visiting was also obtained. Figure 4-3 used in the purchasing process review of Havyard in chapter 4.2.1 has been retrieved from this presentation.

3.3 Quality of Research

The quality of a research can be evaluated according to a variety of measures. Yin (1994) presents some tests that are commonly used to establish the quality of the exploratory case study or any empirical social research for that matter:

- Construct validity which establishes the correct operational measures for the concepts being studied.
- External validity which establishes the domain in which the findings of a study can be generalized.
- Reliability which demonstrates that the operations of a study, like data collection methods can be repeated and lead to the same results.

(Yin 1994)

3.3.1 Construct Validity

The case study tactic to ensure construct validity is to use multiple sources of evidence, establish a chain of evidence, and have key informants review draft case study reports (Yin 1994). To address to issue of construct validity, this study has used several interview sources. At the same time, some of their statements have been underlined in documentation such as the description of the purchasing process in Appendix 4. A chain of evidence has been established by first having defined a research problem and a set of research questions. Then a theoretical framework has been based upon this, and a set of propositions developed as a result of the literary findings. As the literature was not able to answer the research questions completely, the next source of evidence was through the case study. The case study research tested whether the propositions developed after the theoretical framework was valid in this research and in this context. The conclusions to the research questions have then been drawn after the case study has filled in the final gaps of the answers. Figure 3-2 illustrates the chain of evidence in the research.

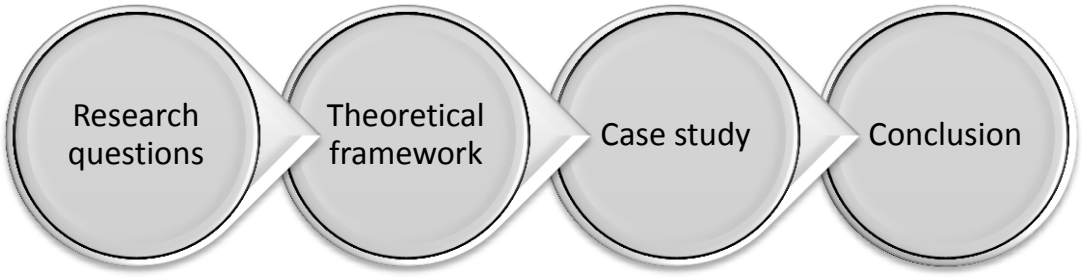

Figure 3-2: Chain of evidence in study

While the key informant of the study has not reviewed any case study reports, critical findings in the case study have been thoroughly discussed as to not get any misperceptions but a correct understanding.

3.3.2 External Validity

The case study tactic to ensure external validity is to use replication, a logic in multiple-case studies (Yin 1994). This research is based on a single case study. As a result, the external validity of the research could be called to question. The initial intention was to be able to generalize the findings to the shipbuilding domain with the assumption that such companies have similar information needs and challenges in purchasing. However due to the lack of replication, future research and more case studies is suggested as ways of achieving this.

3.3.3 Reliability

The case study tactic to ensure reliability is to use case study protocol and develop case study database (Yin 1994). To ensure reliability of research in this study, the thesis composites the case study protocol. Second, a case study database has been developed in appendix 1-5. This database contains summaries of the performed interviews as well as the documentation that has been used throughout the research.

4 Analysis

This chapter constitutes the analysis of the study. The objective of the analysis is to give insight to and an understanding of the nature and complexity of intra-organizational information sharing in purchasing activity in shipbuilding. The case study of Havyard has given a real-life context for investigating the research questions, and the findings will be replicated in this chapter. The chapter is structured in such a way that each research question will be investigated chronologically. First, a brief introduction to the Havayrd Group AS.

4.1 Case Study: The Havyard Group AS

The Havyard Group AS was established in 1999 and is a fully integrated shipbuilding enterprise located at the West Coast of Norway. Situated in the middle of the maritime cluster, the group's head office is in Fosnavåg, south of Ålesund. The company operates on the global market and offers ship design, shipbuilding technology, ship equipment, systems and service to ships. As part of the maritime cluster the company has specialized in state-of-the-art offshore and fishing vessel technology. Their vision is to be the most innovative supplier of shipbuilding technology in the world (Appendix 2, Havyard n.d.).

The enterprise wishes to keep the most technologically advanced elements of shipbuilding within the group. Their goal is to have good communication across the board, clearly defined roles and responsibilities, and systems and procedures that best serve their intentions. The Havyard Group consists of four divisions along with purchasing, operations, finance, human resources, and business development as supporting functions (figure 4-1). Havyard Global Solutions AS is a sales and marketing company within the group targeting international customers for selling limited system packages. This division only deals with external customers and does not supply other divisions within the group. Havyard Ship Technology AS is the group's own shipyard. This company is located about 260 km from the main office, at Leirvik in Sogn (Gule Sider 2012). It is here the company builds its own complete vessels, all carrying the Havyard design. This design is developed within Havyard Design & Engineering AS, the design and engineering company within the group. Havyard Power & Systems AS is responsible for electronic products, engineering and installations. This division is located in Ålesund and in Leirvik, and mainly acts as an

internal supplier within the group. However, when capacity is high it also delivers to outside customers to exploit its full capacity (Appendix 1, Havyard n.d.).

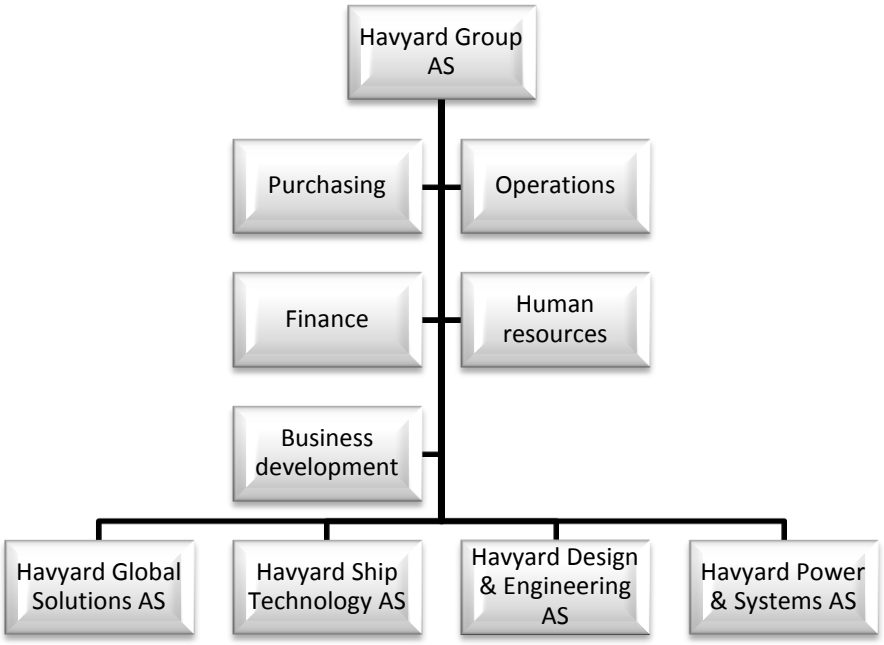

Figure 4-1: Organizational structure of the Havyard Group AS (Havyard n.d.)

The unit of analysis in this study is the purchasing function at Havyard. This purchasing function is split in two departments; one is located at the main office in Fosnavåg, the other at the yard site in Leirvik. The purpose of having two departments is that they each serve a different segment downstream the supply chain. While the department in Fosnavåg supplies operations within Havyard Global Solutions, the department in Leirvik supplies the yard operations. However, in the market place the company wants to be perceived as one coherent customer, and the two purchasing departments work as a team (Appendix 1).

4.2 Q1: What are the Information Needs in Purchasing Activity and for Improved Purchasing Performance in Shipbuilding?

The purpose of this first research question is to identify the information needs for purchasing activity in shipbuilding with the aim of disclosing information needs that are not satisfied. Revealing such gaps will ultimately open opportunities for improving purchasing performance.

4.2.1 Information Needs for Purchasing Activity in Shipbuilding

The purchasing function at Havyard has a mission of being a center of expertise for a commercial and competitive purchasing process that adds competitive power to the Havyard Group. As established both in the introduction and the theoretical framework, information sharing is a key force in organizational performance and towards increased competitive advantage. In order to get an overview of Havyard's information needs in purchasing activity, a review of their purchasing process will be undertaken with a focus on information flow in this process. Within each step of the process the objective is to identify what the information need for that step is, what the purpose of having that information is, and the source for obtaining that information. As shown in the theoretical framework, the first steps of a purchasing process are the most influential in terms of costs and effort (Appendix 3). This is the part of the process that can be termed the decision process and may account for 80 % of the expenses for the entire purchase. Through interview with the purchasing function at Havyard, it was established that this recognition was true for them as well. The first steps of the purchasing process are the most demanding both in terms of costs and effort. For the purpose of improving purchasing performance these steps would then be the legitimate part of the process to investigate. The review of the purchasing process will therefore undertake the steps from where the need for purchase is recognized, to the contractual agreement with the supplier is drawn. The data for the review is gathered through interview and documents, and is found in Appendix 1-3. Figure 4-2 illustrates the first steps of the purchasing process at Havyard that will be undertaken in this analysis.

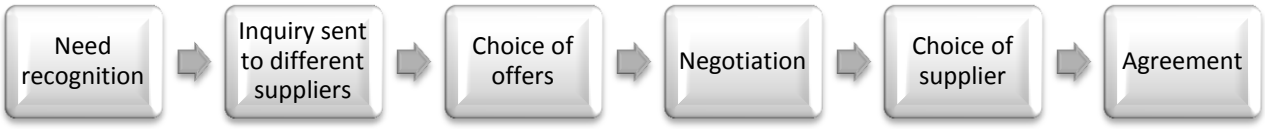

Figure 4-2: The first and most cost influential steps of the purchasing process at Havyard

Step 1 – Need Recognition

The purchasing process at Havyard starts like in the conventional model, with a recognition of a need for purchase.

Information need

The information needs at this stage concerns specification of supplies required to satisfy the need, the quantity of that supply, desired delivery date, plus any additional requests. If there is a preference for a particular supplier this information will also be needed.

Purpose of information

The information about the need is necessary input in the development of a frame agreement for a future purchase. It is also necessary as to specify what suppliers will be relevant for a delivery. Having a good understanding of the need will make the purchasers more able to carry through with a successful purchasing process.

Source of information

The information about the need is obtained in written form through mail or formal order forms. It comes from other units within the organization such as engineering, production, sales etc. Concerning new construction projects, this information may also come directly from the customers. It will then be given through a document called “the makers list” which is a contractual document between Havyard and the customer. If a makers list is not received it is Havyard’s responsibility to prepare a suggestion of a makers list that will be reviewed and approved in cooperation with the customer. The suggestion will be drawn

inside Havyard in cooperation between purchasing, engineering, planning, production, sales etc.

Step 2 – Inquiry Sent to Different Suppliers

At the second step of the purchasing process a frame agreement may be ready to be developed. However, if the specifications for purchase are not final and a supplier is not chosen, the second step involves developing and sending an inquiry to different suppliers.

Information need

For developing an inquiry the purchasing function needs information about which project it concerns (project reference), technical specifications, quantity, desired delivery date, deadline for tenders, contact person and other possible attachments.

Purpose of information

The purpose of the information in the inquiries is to receive offers from potential suppliers. The policy at Havyard is to have a minimum of three offers at hand for each purchase above 10 000 NOK. This will give them the opportunity to further explore which offer is the better through negotiations etc. and not be locked in a single source situation. Being locked to one particular supplier so early in the process would remove the possibility of exercising buyer power. However in certain cases the customer may have a specific supplier request, or certain aspects of the purchase such as price, delivery date etc. determine the choice for supplier.

Developing a thorough inquiry specification is half the job of the purchasing process. It will then be easier to evaluate whether potential offers are consistent with the purchase need. If the suppliers receive inquiries inconsistent with the need, Havyard will have to go through stages of revision later which will only delay the process and incur unnecessary costs. The company recognises a potential for improvement in this area.

Source of information

Information necessary to prepare an inquiry comes from the specification of the need developed in step 1. However this specification is a longer list of variables than the inquiry. As a result, a purchaser will have to withdraw information from the specification.

The problem is that the information needed for the inquiry is split in parts here and there in the specification. The challenge is knowing what to keep and what to leave out. And the less experience a purchaser has in doing this, the harder the task will be, and the bigger is the potential for an imprecise inquiry. If the inquiry is overly specified, one would run the risk of excluding parts of the supplier market and making bad deals. In addition, there is certain information the purchaser will have to add to the inquiry that is not written in the specification. Experience and training is of the essence.

Step 3 – Choice of Offers

The third step of the purchasing process at Havyard concerns the evaluation and choice of offers from suppliers.

Information needs

In order to choose the right supplier, the purchasing function needs information about both technical and commercial specifications in offers from potential suppliers. As certain elements may be differently described in the inquiry and received offers, the purchasers must be alert as to whether or not the information need is covered.

Purpose of information

The information will be used to evaluate which supplier is best suited for delivery according to Havyard's needs. However, going through an amount of at least three offers is a time consuming task. And Havyard is experiencing constraints in both time and resources to following through such as task. And if the preliminary work of the inquiries in step 2 is inaccurate, the company will suffer at this stage of the purchasing process.

Source of information

The information about the offer is granted from each supplier in written form through mail. However as the purchasers at Havyard are commercial and not technical experts, they are dependent on cooperation with engineering to evaluate the information received in the offers. In that respect, the engineering function may also be viewed as a source of information. The purchasers are dependent on information shared by engineering.

Step 4 – Negotiation

The next step of purchasing at Havyard is the negotiation phase. The negotiation takes place with a chosen supplier or several potential suppliers of the previous step.

Information needs

A: In the negotiation phase, information is needed about previous history with the supplier, such as how much money that supplier has earned in doing business with Havyard before.

B: Secondly, it would be purposeful for the purchasers to be aware about upcoming projects within Havyard.

C: Thirdly, to make full use of market information the purchasing function which is split into two departments, should work together and therefore have information about each other's practices with the supplier.

D: Also, through the course of the purchasing process, additional request for the terms of the purchase may encounter. As a result, the specification will have to be adjusted in the negotiations and this information is needed.

Purpose of information

A: It is important for the purchasers to know their strength of buyer power in relation with the supplier, as that will give a better ground for negotiation. If the supplier is better suited and informed about their history than the purchasers at Havyard are, Havyard would view this as a strategic loss. The strategic information will be used to obtain the best possible agreement with suppliers based on product, delivery lead time, price and other terms. There is however potential for improvement in having strategically important information about suppliers available.

B: The purpose of information about upcoming projects is useful in negotiation with suppliers. Shipbuilding is a project oriented activity. When sitting at the negotiation table the purchasers are focused on achieving the best possible deals with the suppliers for one particular project at a time. The problem is that this is not exploiting the full potential that is present. If the purchasers at Havyard could offer the supplier more opportunities to do business later on, the terms of the current deal could be made better.

C: Having information about each other's practices, the two purchasing departments at Havyard would have the opportunity to achieve synergy savings. Figure 4-3 is an illustration developed by Havyard themselves which shows that by working together the two departments can share market information, exchange knowhow and experience, utilize human resources to a greater extent, develop common tools, build a corporate profile, and exploit purchasing power to a greater extent. As explained by the CPO: "It would be unprofessional of us not to work together. If we were operating at different terms with the suppliers at least one of us would be behind, and the company as a whole would suffer". However collaboration requires information sharing between the two departments, and as of today this is an area in which Havyard recognizes improvement possibilities.

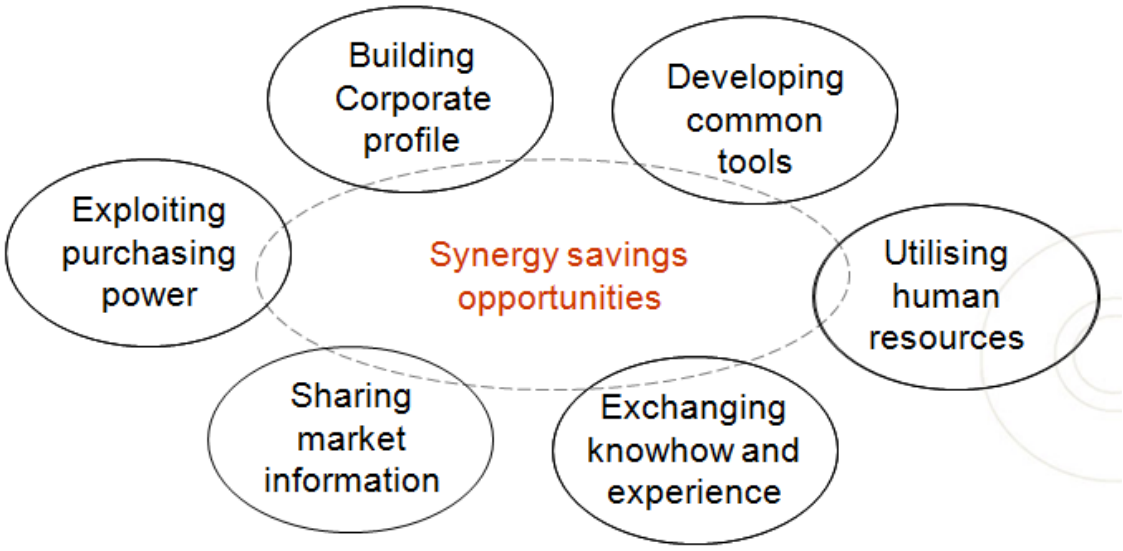

Figure 4-3: Synergy savings opportunities (Havyard n.d.)

D: The purpose of information about additional request is purposeful as to best cover Havyard's information needs.

Source of information

A: Information about supplier history is to some degree embedded in the information systems of the organization. However as to date, the information systems are not able to store data besides pure technicalities such as product description, dates, and quantity. The rest of the information is lost or maintained in the minds of the individuals working within the purchasing function.

B: As the organization's direct link with the customers, the sales function is aware of upcoming projects for the organization. If sales could communicate to the purchasing function early on what projects are coming up, the purchasing function could use this in negotiation with suppliers. However, as the situation is today this information transfer is not happening to the extent of a desired level. There are certain factors within the organization that presents as barriers to internal information sharing.

C: Source of information about each department's practices lie in the individuals and networks that each department constitutes. However, the problem that the company have today is that they are not able to achieve this cooperation to an extent of a desired level. The reason is that information sharing between the two departments is not optimal. There are certain factors within the organization that presents as barriers to internal information sharing.

D: If adjustments in the purchase are needed in the negotiations, the purchasing function may again be dependent on information from the engineers.

Step 5 – Choice of Supplier with Acceptance from Customer

When the negotiations are terminated, the final choice of supplier can be made. This step of the process is a decision step.

Information needs

For choosing a supplier information about the outcome of the negotiations is needed and whether these terms are accepted from the customer Havyard will ultimately deliver to. For internal purchases the customer will be a function or division within Havyard, for external purchases this will be the future shipowner.

Purpose of information

The information will be used to choose a supplier.

Source of information

The information can be obtained from the proposed contract between the purchasers at Havyard and the supplier.

Step 6 – Agreement

Based on the outcome of the negotiations the next step of the purchasing process at Havyard is to write a contract and settle the final terms of the purchase.

Information needs

Information needs for the contractual agreement is specification for scope of delivery, capacity requirements, quality requirements, training requirements, terms of payment and terms of delivery.

Purpose of information

The purpose of this information is to settle for an agreement that controls the following steps of the purchasing process.

Source of information

The main source of information for the contractual agreement with the supplier comes from the negotiations. In the negotiations, the terms have been established.

4.2.2 Information Needs for Improved Purchasing Performance in Shipbuilding

Reviewing the purchasing process at Havyard in the previous step has revealed which information needs the company have in order to improve purchasing performance. This chapter will summarize their challenges related to intra-organizational information sharing.

Challenge 1 – Information Sharing between Functional Units

As disclosed in the purchase process review, technical information from engineering is a critical factor to a successful purchase. Shipbuilding is in many aspects a technically demanding activity. Many of the purchases that are made are of such a technically advanced character, that a commercial expert is not able to grasp its full complexity. The purchasers are dependent on the engineering function for assistance in specifying the technical functionalities of pending purchases. And in negotiation with certain suppliers, the purchasers are dependent on having the technical experts present to negotiate certain terms. Teamwork is in other words at the very essence of purchasing performance at Havyard. While the interviewees could not identify any specific problems related to this teamwork, they emphasized its importance and how the organization would suffer if it failed. It is therefore beneficial to get an overview over the factors within the organization that affect information sharing. As the theoretical framework also highlighted, cross-functional cooperation increases for a product that is customized, technically complex, have high investment and long-term impact.

Also disclosed in the purchase process review, information about upcoming projects from sales would benefit the purchasing function in negotiation with suppliers. The sales function is the organization's contact with customers and is the first to know about future tasks for the organization. The more the purchasers know about future purchases, the better suited they are in negotiation with suppliers. If the purchasers can offer the suppliers more opportunities later on, the more they can negotiate the terms.

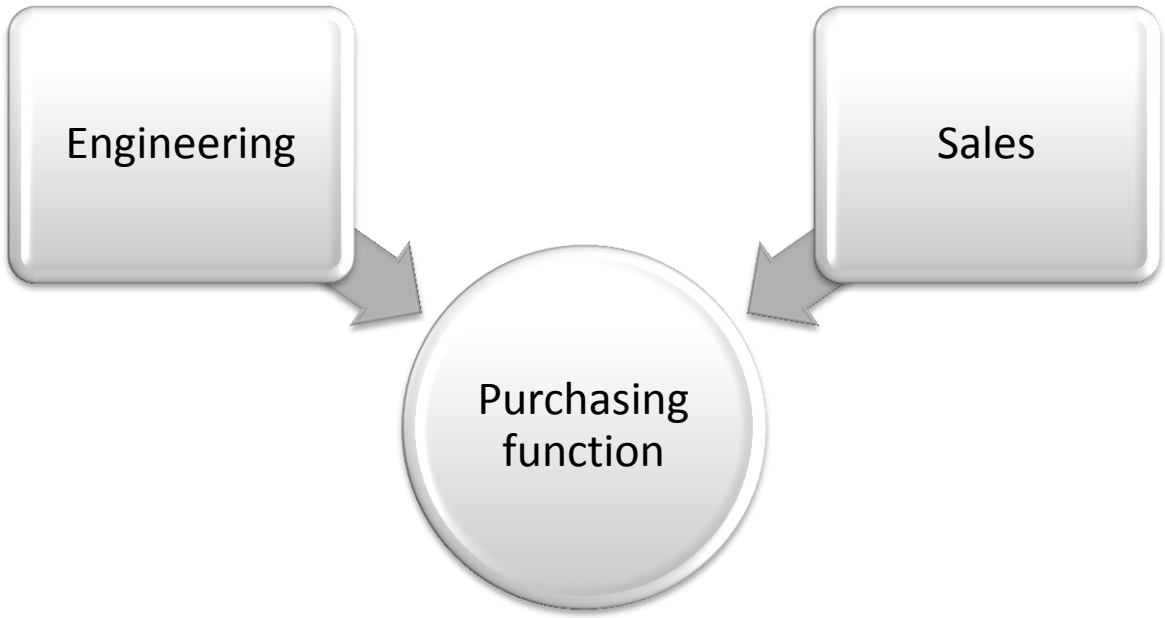

Figure 4-4: Information sharing needs between functional units at Havyard for improved purchasing performance

Challenge 2 – Information Sharing between the two Purchasing Departments

The purchasing process review revealed that there is a potential for enhanced purchasing performance if the two purchasing departments at Havyard are able to improve information sharing in their relationship. The potential lies in sharing market information, exchanging knowhow and experience, utilizing human resources to a greater extent, developing common tools, building a corporate profile, and exploiting purchasing power to a greater extent. All tasks which are dependent on collaboration and information sharing. As of today, these potential synergies are not fully exploited. There are certain barriers in information sharing that prevents them from being so.

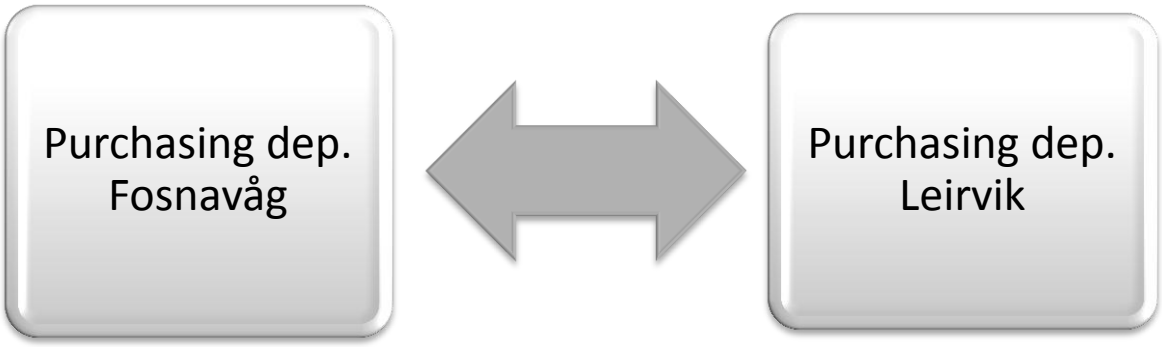

Figure 4-5: Information sharing needs between purchasing departments at Havyard for improved purchasing performance

Challenge 3 – Information Sharing between the Individual Purchasing Employees

The purchase process review disclosed that strategic information about suppliers is to date partially dependent on the information and knowledge each individual purchaser encompasses. Also the ability to achieve synergy savings in purchasing is dependent on the individual purchasers' ability to work together. Improving purchasing performance is then dependent on these individuals ability to share information with each other.
Information sharing between employees is also important in the inquiry development. As stated in the purchase process review, training and expertise is important in this phase and for the employees to learn of each other, information sharing is a prerequisite. As of today, this potential is not fully exploited there are certain factors within the organization that prohibits optimal information sharing.

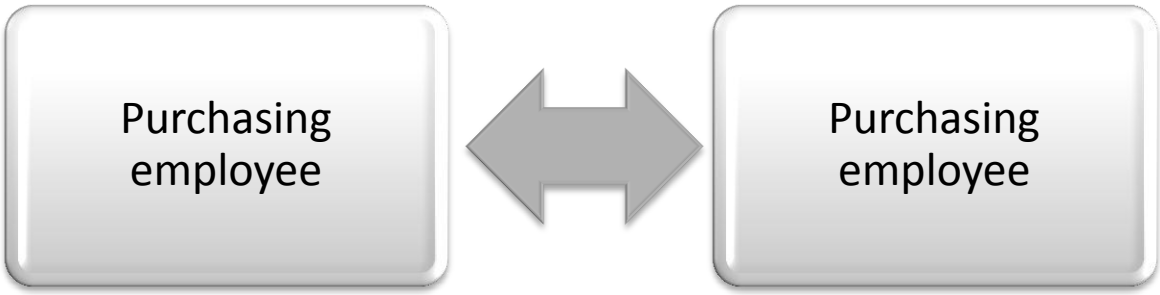

Figure 4-6: Information sharing needs between individual purchasing employees at Havyard for improved purchasing performance

4.2.3 Consequences of Information Sharing Difficulties

The consequences of these information sharing difficulties can show itself evident in loss of market power and potential increased costs. If negotiation is not optimal due to information sharing problems between purchasing employees, and between the purchasing and engineering/sales function, market power is not fully exploited and costs are higher than they need to be. If the two purchasing departments as well as individuals at Havyard are unable to realize synergy effects due to information sharing difficulties, market power is again not fully exploited and costs are again higher than they need to be. And if the purchasing function is unable to exploit technical expertise in teamwork with the engineering function due to information sharing difficulties, market power is not fully exploited and costs are higher than they need to be.

4.3 Q2: What Factors act as Barriers to Intra-Organizational Information Sharing in Purchasing Activity and for Purchasing Performance in Shipbuilding?

Chapter 4.2.2 identified three main challenges of intra-organizational information sharing in the purchasing process at Havyard. In order to elevate purchasing performance, these challenges should be confronted. However, to confront them one need to have an understanding of the underlying factors of the challenges. The factors affecting intra-organizational information sharing in the three challenge areas are intertwined. A factor that influences information sharing between functional units may also influence information between purchasing departments and between purchasing employees. This chapter is therefore structured in such a way that each factor that affect information sharing will be presented with a heading. Whether the factor affects challenge 1, 2 or 3 will then be summarized in a table at the end of this chapter. Identifying the factors that poses as barriers is based on a series of interviews that are summarized in Appendix 1-3.

4.3.1 Organizational Structure

The theoretical framework reported that coordinating different units and departments to share information is critical to improving an organization's capabilities. Cooperation between units and departments foster learning and knowledge sharing. The units and departments may have unique information that others could benefit from. Geographic locations allow for interaction, and two units or departments operating in the same geographic area are more likely to share information. About 4 hours and 260 km driving distance separate the two purchasing departments at Havyard (Gule Sider 2012). Face-to-face interaction is a challenge for them. The CPO at Havyard reports that this distance is a challenge for the purchasing function, and that information sharing is negatively affected. Although the two departments each serve a different purpose and segment downstream the supply chain, they work together in the market place. And negatively affected information sharing compromises the synergy effects to two departments strive for.

Figure 4-7: Map displaying the geographical spread of the two purchasing departments at Havyard

4.3.2 Organizational Culture

As highlighted in the theoretical framework, information must be treated as a source of competitive power in order for information sharing to be improved. The different functional units at Havyard have weekly meetings concerning ongoing projects. The purpose of these meetings is to share information and get an update on status-quo within the organization. However, this intention loses its gravity if the meetings are not treated as important and showing up is not required. The CPO at Havyard admits he should be better at attending these meetings. However they are not prioritized over other more pressing tasks. This could be an indication of information sharing not being given enough value.

This indication was again given at the interview with purchasing staff in Leirvik. Here it was stated that they only attend meetings in which purchasing is set on the agenda. They do not recognize any value for them in the other meetings. As explained in the theoretical framework, units can learn from each other and benefit from new information and knowledge provided and developed by other units. Of course, not attending the meetings could be related to scarce resources within the organization, but it could also be rooted in the culture. The suspicion is then that the organizational culture does not promote information sharing as a key resource sufficiently enough. If information is not emphasized as a value within the organization, the culture will also not promote it, and the culture may act as a barrier to sharing.

In order for information sharing to be improved, one must recognize that there are problems related to it in the first place. During an interview, it was discovered by the researcher that there seems to be a conflict with how information sharing challenges are viewed within the purchasing function. First of all, it was recognized by the CPO that information sharing could be better within the organization and within the purchasing function. But at the site visit in Leirvik another impression was made. Here the interviewees found it difficult to think of any information sharing difficulties. An example of can be made of a statement one of the interview objects made: "The specification is that well prepared that mistakes seldom occur later on in the purchasing process. And if a mistake would happen, we would learn from it and it would not happen again." Also, when the researcher tried to ask whether the purchasers felt they had anything to learn from other units etc., little response was given. It seems like there are split opinions as to whether information sharing is a challenge within the organization and within the purchasing function.

4.3.3 Information Systems

The CPO at Havyard states: "Our IT systems are not good enough". His statement partly refers to the IT system's inability to communicate with each other. Havyard mainly works with two information systems in their daily operations; Visma and Triark. Visma is an economy and administration software used in purchasing and accounting tasks. Triark is a project information management system. Both systems are needed to store data and information but since they do not communicate with each other the employees have to

register data and information twice, once in each system. Such double work costs time and resources. The organization should strive to have information systems that are integrated and therefore makes information sharing easy. Having two separate, non-integrative information systems negatively affects information sharing efficiency.

Another fault of the information systems is that the user threshold seems to be too high. As established in the theoretical framework, perceived usefulness and user-friendliness influence the degree to which information systems are accepted to their full use. IT usage will be lower if the technology is not user-friendly and as a result information sharing is negatively affected. Employees will likely not use system functions that take up too much time and effort. The CPO at Havyard recognises that for certain information needs, while information is available in the systems the employees are not able to obtain it do to the user threshold. As a result, they have to contact others for help. Again it costs time and effort and information sharing is not as effective as it can be. Technical systems should have the ability to speedily extract necessary information.

Further, a goal within the purchasing function at Havyard is to have information systems that are able to store data about suppliers that can be used in negotiation later on. As reported in the purchasing process review above, having strategic information easily obtainable will make them better suited to negotiate. As to date, the information systems are not able to store data besides pure technicalities such as product description, dates, and quantity. The rest of the information is lost or maintained in the minds of the individuals working within the purchasing function. This information should not be lost, but rather be kept and harnessed for improving purchasing performance. The value of information in strategic use has been highlighted throughout this study. The purchasing function wants to have strategic information about suppliers easily obtainable within own systems, but the information systems are not advanced enough to permit this. Information sharing is again negatively affected within the purchasing function.

4.3.4 Characteristics of Information

The theoretical framework reported that the characteristics of information may have implications for sharing. Explicit knowledge which can be expressed in words, numbers, formulas, charts etc. is easier shared than tacit knowledge that is subjective, experience-

based, and difficult to express and communicate. In a purchasing situation, the characteristics of information may be separated into strategic, tactical, or operational information. And in a purchasing context, strategic information is more difficult to share than operational and tactical information. While operational information may be typed in the databases, strategic information may be embedded in the individuals of the organization. As so, it can be compared to the characteristics of tacit knowledge. The theoretical framework also highlighted that when information exists on the individual and not the collective level is more difficult to share.

During the interviews with purchasing employees at Havyard, it was also recognized that strategic information is more difficult to share both between functional units, between departments, and between individuals. They value information as strategic when the information is used for positioning in the market or in negotiation with suppliers. An example of such information that could be of strategic significance is information about possible upcoming projects. This information sharing challenge is expressed in Challenge 1 in chapter 4.2.2. Characteristics of information are affecting information sharing, and in a purchasing context, information sharing is more negatively affected the more strategic the information is. Not because the employees do not wish to share it, but because such information is hard to implement on the collective level. As established in chapter 4.3.3, the information systems are not able store such information or knowledge and it is more easily lost.

4.3.5 Information Sharing Challenges the Factors Affect

The previous sections have identified organizational structure, organizational culture, information systems, and characteristics of information as barriers affecting intra-organizational information sharing in purchasing activities and for purchasing performance in the case study of Havyard. In chapter 4.2.2 the challenges sharing of information was separated into three groups, namely intra-organizational information sharing between functional units, between purchasing departments and between purchasing employees. Table 4-1 below shows what factors affects what challenge.

Table 4-1: Information sharing challenges each factor effects

	Challenge 1 – between functional units	Challenge 2 – between purchasing departments	Challenge 3 – between purchasing employees
Organizational structure		X	
Organizational culture	X	X	X
Information systems	X	X	X
Characteristics of information	X	X	X

4.4 Q3: How can Intra-Organizational Information Sharing in Purchasing Activity and for Enhanced Purchasing Performance in Shipbuilding be Improved?

Chapter 4.2 identified the factors that act as barriers to intra-organizational information sharing in the purchasing process at Havyard. As established by several researchers in the introduction and the theoretical framework, facilitating better information sharing has a positive impact on organizational performance. The purpose of this chapter is to investigate how intra-organizational information sharing can be improved by removing or diminishing these barriers. The suggestion of how this can be accomplished is based on the findings in the theoretical framework as well as through interviews with the purchasers at Havyard (Appendix 1-3). The goal is to ultimately improve purchasing performance.

4.4.1 Improving Intra-Organizational Information Sharing in Organizational Structure

The theoretical framework showed dispute as to whether properties of organizational structure affected intra-organizational information sharing positively or negatively. The case study of Havyard can only present findings of how geographical structure affects intra-organizational information sharing. With a purchasing function split in two departments over 4 hours' drive from each other, information sharing is negatively affected.

The yard in Leirvik was bought by Havyard in 2000. The yard is a cornerstone business in this small local society. Leirvik have had a long tradition of shipbuilding. For over 50 years these operations have been the most important livelihood in the community. Without the yard, the area would probably struggle to make ends meet. They are dependent on the yard operations (NRK 2009). Havyard has no intentions of moving the yard operations closer to the main office in Fosnavåg. And the main office in Fosnavåg is in the neighborhood of suppliers and customers in the maritime cluster so the company has no intentions of moving the main office to Leirvik. At the same time the purchasers at the yard in Leirvik need to be close to the yard operations in order to fulfill its supporting

function. Moving the department to Fosnavåg would make information sharing with other units a far bigger challenge. Moving the purchasing department in Fosnavåg to Leirvik would only create distance to suppliers. And as established in the theoretical framework, having good supplier relations is an important premise in today's competitive markets. As a result, having two purchasing departments geographically spread will remain for the time being.

As the geographical distance is hard to remove as a barrier, the other factors inhibiting information sharing become more critical to tackle.

4.4.2 Improving Intra-Organizational Information Sharing in Organizational Culture

The theoretical framework established that intra-organizational information sharing is negatively affected when the organizational culture does not promote information as a valuable resource. Chapter 4.3.2 found indications in the case study of Havyard that information is not sufficiently valued as a source of competitive power in purchasing. As a result, information sharing is negatively affected. Through interviews (Appendix 1-3) and the theoretical framework, this research has found some possible measures Havyard could take in order to remove or diminish the intra-organizational information sharing barrier for purchasing activities caused by organizational culture. These are to *make the entire organization value information as a key strategic resource,* to *foster trust between organizational members,* to *foster a belief in information as a collective resource,* to *become better at attending cross-functional meetings,* to *arrange social events,* and to *use performance-based reward systems and evaluations.* This will be elaborated on in the next few sections.

Make the entire organization value information as a key strategic resource

Today, a common practice at Havyard is to only register necessary information in the databases, not any additions. Information does not seem to be sufficiently valued as a force to organizational success. Making the purchasers and the entire organization value information as a key strategic resource should be a top priority at Havyard. Without recognition, there can be no improvement. But how can such a mindset be implemented in the employees? First of all, the management has a key, leading role. The management

should lead by example and express themselves how they view information and knowledge as a source of competitive advantage. They should encourage it and formulate guidelines, policies, and procedures on information sharing. Second, they should foster trust between employees, a belief in the collective ownership of information, commit to cross-functional meetings, arrange social events, and to use performance-based reward systems and evaluations. These measures will have more thorough explanations in the next sections. If information is valued as a competitive force the absorptive capability within the purchasing function and organization may also be enhanced.

Foster trust between organizational members

To diminish an information sharing barrier caused by organizational culture, trust may an issue to address. As shown in the theoretical framework, trust has the ability to influence information sharing directly and indirectly through relationships and culture. Trust among organizational members has a positive effect on information and knowledge sharing, and people are only disposable to sharing if they feel that they are protected against opportunism. When trust is not present in a relationship, formal information sharing efforts are insufficient and a barrier to sharing is present. Trust is not something that can be imposed by someone, but the individual itself has to naturally feel it.

However there are certain measures the management could take in order to establish a fertile ground for fostering trust relations in the organization. As the theoretical framework presented, relationships with repeated contact and that are consistent with positive outcomes, builds long-term commitment, cooperation, and the willingness to take risk, and ultimately create trust. As so, the management should strive to create an organization where employees have the opportunity to frequently interact, and feel that they are part of a team where the only way to success is working together, supporting each other, and commit to the common good. This linked to the next effort the organizational can make to improve intra-organizational information sharing, namely to *foster a belief in information as a collective resource.*

Foster a belief in information as a collective resource

The theoretical framework highlighted that fostering a belief in information as a collective and not individual resource enhances information sharing. It is the management's responsibility to foster this belief. Putting the emphasis on improving social identity with

the organization could be a way of doing this. Social identity is fostered when people share the same belief, symbol, attitude and behavior. The employees must feel that they are part of a collective whole, and working towards the organization's best interest is the same as working towards their own best interest. There is no definitive answer on how to foster social identity in the organization and a belief in information as a collective resource. However, the managers at Havyard could be conscious about promoting the collective interest before the individual interest and use the "we" term before the "I, you, them" terms. If solidarity, mutual interest, and shared goals are at focus, the members will tend to hold stronger beliefs of organizational rather than individual ownership of information, and hence information is shared.

Become better at attending cross-functional meetings

As reported in chapter 4.3.2, attending the weekly cross-functional meetings at Havyard is not a top priority for the purchasers. They are attended if there are no other more pressing tasks at hand and if purchasing tasks are at the agenda. However, this does not signal a strong commitment in cross-functional information sharing. These meetings could be a good platform for sales to communicate to the other units about upcoming project for the organization. But if the purchasers are not present to receive that information they will not be able to use it in negotiation. If a sale is not fully determined the sales function will not register it in any database and the sales function and the purchasers must have a meeting ground for transferring information. These meetings provide that ground, and attendance should be more strongly encouraged by the management if not made mandatory. However, the management must themselves lead by example then and attend the meetings themselves. If making the meetings mandatory is too aggressive, making the employees value information as a key strategic resource could serve as an incentive to attend. This was the previously proposed measure.

Arrange social events

The theoretical framework emphasized social networks and social identity as positively affecting intra-organizational information sharing. And although social networks are naturally formed, the management could encourage it by arranging social events. These events could for instance be social dinners outside work hours, quiz-sessions, trips etc. The more informal relations that are present in an organization, the more channels exist for

information exchange between members. And when individuals feel part of a group or network they are more inclined to contribute to the collective good, hence share information.

Use performance-based reward systems and evaluations

As established in the theoretical framework, the use of performance-based reward systems positively affects employees to share both information and knowledge. It motivates organizational members to generate new information and knowledge, share existing information and knowledge, and help people from other departments or functional units. If the management at Havyard start with giving feedback to the employees concerning work accomplishments and performance, they may guide the employees in actions for obtaining specific knowledge.

4.4.3 Improving Intra-Organizational Information in Information Systems

Information systems affect information sharing positively when it enables an organization to share information timely, accurately, and reliably. But as established in chapter 4.3.3, the information systems at Havyard have negative impact on information sharing within the purchasing function and the organization. Through interviews (Appendix 1-3) and the theoretical framework, this research has found two possible measures Havyard could take in order to remove or diminish the barrier of information sharing caused by information systems. These are to *invest in better IT-solutions* and to *implement mandatory IT-training for the employees*. This will be elaborated on the next two sections.

Investing in better IT-solutions

As established in chapter 4.3.3 the information systems at Havyard are not efficient enough. The organization has two systems that do not communicate, that have too high a user threshold for certain information tasks, and that are not able to store strategically important information. According to the theoretical framework, it is the management's responsibility to review the properties of the technical systems. Designing an information system that precisely addresses user needs is one of the most significant factors affecting information system success. As having two non-integrative information systems is troublesome and inefficient, the management should evaluate whether this policy is the

best one going forward with. The fast pace business environment of today demands fast pace movement of information in order to keep up with competition. Organizations are therefore increasingly recognizing the strategic advantages that come from IT investments. It is no longer seen as merely a cost of doing business, but as an enabler of doing business effectively and efficiently. ERP-systems are common for larger organizations today. ERP-systems allow for easier global integration by having barriers of currency exchange rates, language, and culture bridged automatically. It integrates people and data while eliminating the need to update and repair many separate computer systems. And it allows management to manage operations, not just monitor them, as data on every branch of the organization is easily obtainable. An ERP system has the potential to dramatically reduce costs and improve operational efficiency (Monk & Wagner 2009). Havyard has grown a lot since the start in 1999. Having about 270 employees the organization has become rather large and they have ambitions of growing more. It might be time for considering an investment in one single information system that is able to perform all of the tasks that are necessary to increase information sharing capabilities and competitiveness. As established in chapter 4.3.3, the information systems of today are not able to store certain information that would be strategically useful in negotiation with suppliers etc. Going forward in an industry characterized by overcapacity one needs to be cost efficient (ref. chapter 1.3). As information is not fully exploited today, the company is not as cost-efficient as it can be.

However, investing in an ERP-system is expensive, and demands years of training and implementation. So whether the benefits of such an investment will exceed the costs is a decision for the management to make. Either way, there is strong indication in this research that something must be done concerning the properties of the information systems.

Mandatory IT- training among employees

Chapter 4.3.3 established that the information systems Havyard have today are not easy enough to use in retrieving certain information. This could be related to the properties of the systems, but the CPO also believes that training could help enhance the user ability across the purchasing function and the organization. Employees differ in their IT capabilities so implementing mandatory training with regular refresher courses could help information sharing. Less time and effort is then spent, and information sharing is more effective.

4.4.4 Improving Intra-Organizational Information Sharing for Characteristics of Information

The theoretical framework established that characteristics of information have implications for intra-organizational information sharing. Explicit knowledge in more easily shared than tacit knowledge. The case study showed that characteristics of information also have implications for intra-organizational information sharing for purchasing activities. Operational information is more easily shared than strategic information. However, strategic information in purchasing will always be strategic information, and the properties of it cannot be changed in order to improve information sharing. But if for instance information system capability would be enhanced it could diminish the barrier of characteristics of information. This if the improved systems would permit a greater input of such information.

5 Conclusion

5.1 Conclusion

This study has attempted to provide insight into the understanding of intra-organizational information sharing in purchasing activities and performance in shipbuilding. By integrating relevant research on intra-organizational information sharing and purchasing activity, and performing a case study of the Havyard Group AS, the study has found challenges, barriers, and facilitators of this concept.

Research question 1 asked: *What are the information needs in purchasing activity and for improved purchasing performance in shipbuilding?*

The information needs in purchasing activity were disclosed by reviewing the purchasing process at Havyard in terms of information flowing through the process. It was found that some of the most important information needs the company had were related to technical expertise from the engineering function, information about upcoming projects from the sales function, and exchange of information and knowhow between the two purchasing departments and individual purchasing employees in order to achieve synergy savings. This highlighted three main challenges in improving purchasing performance within Havyard, namely information sharing between functional units, information sharing between the two purchasing departments, and information sharing between individual purchasers.

Research question 2 was then concerned with the factors in the organization acting as barriers to information sharing, it went as follows: *What factors act as barriers to intra-organizational information sharing in purchasing activity and for purchasing performance in shipbuilding?*

Through interviews with the purchasing staff at Havyard it was revealed that some of the most important factors acting as barriers to intra-organizational information sharing in purchasing activity today are:

- organizational structure due to geographical distance between purchasing departments

- organizational culture due to lack of recognition for information as a valuable resource and for there being any information sharing difficulties
- information systems for having two non-integrative systems with too high a user threshold and poor storage capabilities
- characteristics of information as strategic information is harder to share than pure operational information

The third research question was then concerned with removing or diminishing these barriers as to facilitate information sharing, it asked: *How can intra-organizational information sharing in purchasing activity and for enhanced purchasing performance in shipbuilding be improved?*

By combining suggestions from the theoretical framework and information from the interviews, a set of measures the management at Havyard could put in place to improve intra-organizational information sharing for purchasing activity and for enhanced purchasing performance was developed.

In order to improve intra-organizational information sharing in organizational culture, the management at Havyard could:

- make the entire organization value information as a key strategic resource
- foster trust between organizational members
- foster a belief in information as a collective resource
- become better at attending cross-functional meetings
- arrange social events
- use performance-based reward systems and evaluations

In order to improve intra-organizational information sharing in information systems, the management at Havyard could:

- invest in better IT-solutions
- implement mandatory IT-training for the employees

Nevertheless, whether the costs of implementing these measures will exceed the costs, is up to Havyard to evaluate. The barriers of organizational structure and characteristics of

information seem harder to address. The geographical distance between the two purchasing departments in Fosnavåg and Leirvik is constant, and there is no present opportunity for any of them to relocate. Though strategic information is more difficult to share than operational information the barrier of that itself cannot be diminished as strategic information will always be strategic information and therefore difficult to transfer between parties.

5.2 Limitations and Further Research

The purpose of this study was to generalize the findings to shipbuilding organizations with the assumption that such companies have similar information needs and challenges in purchasing. However due to this study being an exploratory, single case study it is questionable whether this can be done and if external validity in the study is present. It is therefore suggested that further research may conduct a similar study as to explore whether the results are consistent with this one.

Further, this study attempts to provide insight to the intra-organizational factors affecting information sharing for purchasing activities and performance. As such, inter-organizational factors are not taken into consideration. This could be an idea for future research.

This study also does not attempt to provide a complete list of factors affecting intra-organizational information sharing for purchasing activities and purchasing performance. Neither does it attempt to provide explanations for the relationship between the factors.

Further research might attempt to conduct a more thorough research on how factors like trust, power games, social identity and social network affect intra-organizational information sharing in purchasing activities. Havyard has a small purchasing staff and it is therefore hard to obtain full anonymity in the research. As such a larger purchasing function in another company, or having respondents from several companies would be a way of pursuing this. It is difficult for obtain truthful answers about such issues if the respondents feel they can be revealed in their answers.

And lastly, the thesis does not evaluate whether the proposed measures for enhance intra-organizational information sharing will have benefits that exceed the costs of implementation.

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7 Appendix

Appendix 1 – First Interview at Havyard

Date, location: February 7th 2012, At Havyard's main office in Fosnavåg

Interview object: Chief Procurement Officer of the Havyard Group

Relevant responses gathered through interview:

- Purchasing is more than just offers and negotiations, it is about relations and developing good suppliers
- Havyard has a small purchasing staff. This makes practical issues a priority while more strategic considerations such as sourcing and market intelligence are neglected. This is a typical issue for Norwegian shipbuilders in general.
- The goal at Havyard is to be good at capturing strategically important information and be able to use this information in negotiation with suppliers.
- The purchasing function wants to get a clearer overview over the underlying factors that influence purchasing costs. This could be such as wage developments in supplier countries, fluctuations for prices on commodities, service costs etc. One wants to be good at guessing prices with suppliers as to be in a good negotiating position.
- A goal is to be able to use upcoming projects as a way of negotiating terms with suppliers. The more volume one can offer the supplier, the better deals one can achieve. Hayard has improvement potential here.
- Havyard has a geographically decentralized structure, the yard is far away from the main office. The main office is in Fosnavåg, the yard is in Leirvik.
- Have two purchasing departments. They each serve their own segment. The purchasers in Fosnavåg work for Havyard Global Solutions. The purchasers in Leirvik supply the yard operations. However, they want to be perceived as one customer in the market place.
- Weekly meetings between functional units where information is shared. Purchasing should be better at attending these meetings.
- Purchasing is dependent on information from all disciplines.
- Critical purchases:

    - Engines as the designers must know how to fit them to the rest of the design. This must be clarified early on.
    - Propellers as the designers must know how to fit them to the rest of the design. This must be clarified early on.
- The information systems at Havyard are not good enough. It is impossible to put certain information that would be strategically significant later on. For instance, for purchases one is only able to have input information on the price and supplier of a purchase. One would also like to store information about other specifications in the information systems.
- The information systems are not able to store data besides pure technicalities such as product description, dates, and quantity
- Visma is an economy and administration software used in purchasing and accounting tasks. Triark is a project information management system.
- Both systems are needed to store data and information but since they do not communicate with each other the employees have to register data and information twice, once in each system. Such double work costs time and resources.
- Much information within the organization is through mail. As a result, not all information is picked up. This incurs extra costs. Could for example concern equipment one have not been able to register the first time.
- There is a lot of information that flow between the functional units and different departments, but one would benefit from structuring this information flow to a greater extent so one could exploit it better.
- Havyard has grown immensely from the start. As a result the organization is suffering from growth pains.
- Havyard Ship Technology is the yard operations within the group.
- Havyard Power & Systems is an internal supplier within the group, but also deliver to external customers at times in order to exploit full capacity. This company is located in Ålesund and Leirvik.
- Havyard Global Solutions targets international customers and acts as a supplier to yards around the world. They sell system packages with the Havyard brand.
- The goal of the purchasing function is to have good communication, clearly defined roles and responsibilities, and well-functioning systems and procedures. Interaction is important.

- The reasons why information control is limited is due to decentralized structure, e-mail oriented information exchange, information is sent to however the sender thinks it may concern and that may be wrong sometimes.
- The organization is missing a good project information database where every functional unit could contribute information such as meeting references etc.
- The two departments should work together as to achieve synergy. In order to so one must have access to each other's databases concerning supplier information.
- It would be unprofessional of them not to work together in the supplier market. Both departments use the same suppliers and if one department gets a better deal then the other the company would be the loser.
- Though the Havyard Group is consisting of several subcompanies, they view the group as one company. They want to be portrayed as one larger company externally.
- The possibility to influence costs is higher in the earlier stages of the purchasing process. After the contract for purchase is signed, little can be done.
- Havyard has no intentions of moving the yard operations closer to the main office in Fosnavåg
- And the main office in Fosnavåg is in the neighborhood of suppliers and customers in the maritime cluster so the company has no intentions of moving the main office to Leirvik

Appendix 2 – Second Interview at Havyard

Date, location: March 1st 2012, At Havyard yard in Leirvik in Sogn

Interview object: Purchasing manager at Havyard Ship Technology
& a purchasing employee at Havyard Ship Technology

Relevant responses gathered through interview:

- Purchasing process starts with specification and a makers list.
- 1, 2, 3 rounds of pricing. Close collaboration with engineering at this stage.
- Information is lost as some people fail to send information to the right people.
- Information overload is some cases as some people send information to everyone.
- Current informationsystems are Visma, Triark, the Home Page and a Havyard information portal.
- Visma is used for accounting and purchasing.
- Visma does not communicate with Triark, and will never do so either. This causes duplication of work as elements that needs to be registered in both systems need to be handled two times.
- The goal is to have 100% of purchases registered in Visma.
- Everyone has access to Triark where one can find packing lists, purchasing documents etc.
- The Havyard information portal contains information about HSE, injuries, new projects, deployments, improvement issues, courses, news etc.
- Mistakes seldom happen in the purchasing process as the specification is very thorough. If a mistake would happen, one would learn from it and it will not happen again.
- At the project meetings, the purchasing function only prioritizes meetings they play an active role in.
- Critical purchases are:
    - The cranes due to their long lead time, could be 12 months delivery. Every crane has the same foundation, but delivery is critical
    - Engines as the designers must know how to fit them to the rest of the design. This must be clarified early on.
    - Propellers as the designers must know how to fit them to the rest of the design. This must be clarified early on.

    - Helideck as the designers need to be aware of foundation and structure early in the design and engineering process
- Per Sævik bought Leirvik yard in 2000. Company has grown immensely since then. There have been many acquisitions, new employments etc.
- Having too many suppliers only causes chaos. More money to earn if one is rational.
- Shipbuilders are the risk-takers in their value chain. A supplier would probably go bankrupt if he had to carry the cost of failed delivery. One cannot incur the costs on the customer due to contractual obligations and a set price.
- Havyard has grown a lot since the start in 1999. Having about 270 employees the organization has become rather large and they have ambitions of growing more.

Appendix 3 – Third Interview at Havyard

Date, location: March 29th 2012, At Havyard's main office in Fosnavåg

Interview object: Chief Procurement Officer of the Havyard Group

Relevant responses gathered through interview:

- Purchasing may account for about 75 % of the value of a contract. If for example a new Platform Supply Vessel (PSV) has a contract value of 350 million NOK, the purchase of material, equipment and services may stand for 263, 5 million NOK. Of total expenditures, purchasing may hold an 85 % portion.
- The first steps of the purchasing process are the most demanding both in terms of costs and effort.
- Specification is made before a contract is signed, the specification is a proposition.
- Purchasing and sales collaborate in calculating costs
- If there is a preference of supplier this should be stated in the specification/makers list
- A makers list should contain at least three potential suppliers so one can use the market and get more offers.
- The makers list is a contractual document.
- The goal is to establish good routines in developing the purchase plan so that this document can serve as a controlling device.
- If the inquiry sent to the suppliers is good, half the job is done. It will then be easy to evaluate whether incoming offers are consistent with the purchase needs. If the supplier does not get a good description of the need, more revising must be done later on in the purchasing process
- The goal of to get competitive offers in return of the inquiries so the inquiry should not be too strict. It should open for more potential suppliers.
- There is a challenge in withdrawing information from the specification to the inquiry. One needs experience in doing this right. Information is place here and there in the specification and this is hard to do right without experience. As a result, inquiry will be inaccurate.

- There is a balance to not over specifying the inquiry and not under specifying it.
- Elements can be differently described in the inquiry and the offers. Different companies use different codes and names some the same.
- The purchasing function is not technical experts, have to cooperate with technical staff in order to evaluate offers. Evaluating 3 offers is time consuming and compromises time and resources. It is especially time consuming if preparation work is not thorough.
- The purchasers choose which suppliers they wish to negotiate further with. Negotiation is on both technical and commercial terms. New review of specifications is done, one have to check that all needs are listed. New needs may have arisen in the meantime between the inquiry and this stage.
- The day teamwork between engineering and purchasing fails is not good. Teamwork means everything as the purchasers are only commercial experts.
- Information needs in negotiation: history of supplies, how much money the supplier has earned in doing business with Havyard before. There is a problem if the supplier has more information than Havyard regarding their relationship.
- The goal of negotiations is to sell opportunities to the supplier, to achieve the cheapest deal. Should have more control over information the sales function have about possible upcoming projects. Should have better information arenas for this.
- One have to think in terms of volume and synergy in dealing with suppliers. It is easy to focus on one project, but keeping upcoming in mind could be beneficial. It is about making the pie as large as possible for the supplier. This information is in the sales function.
- The purchasing function should have good routines for exchanging information between Leirvik and Fosnavåg. Recognizes improvement possibilities, distance is a challenge.
- There is a great potential for improved information sharing in IT. The information is present within the organization so having systems that facilitates sharing would help the organization.

- User threshold of the systems today are too high for performing certain tasks. It then becomes necessary to contact others for help. Information is available in the systems the employees are not able to obtain it do to the user threshold.
- A combination of training in IT-use and structuring the systems seems like a solution.
- Would like to have the same number of a purchase on every document that flows through the process. Sometimes they differ in the calculation table, purchase plan, etc. Want to have read tread so there are no discrepancies.
- Each supplier have their own number in the systems, but sometimes a supplier have many numbers and information about that supplier is then spread across the database which is a problem when doing research for negotiations etc. One wants to know how much that supplier has earned in doing business with Havyard before etc.
- Only necessary information is registered in the information systems, one line of information.
- The purchasers want to use minimal time preparing a negotiating position.
- Strategic information is more difficult to share in general.

Appendix 4 – Utdrag fra Innkjøpsprosessen på Havyard

Innkjøpsprossesen

1. **Input**

- **Behov**

Bestilling av varer kan utføres av personer ihht mandat i prosjektet /avd.budsjett.
Behov for varer og tjenester skal meldes skriftlig til innkjøpsavdelingen enten via mail eller at rekvirent fyller ut "Bestillingskjema" eller "Order Form – parts, pipes, armatur".
Rekvirent foreslår leverandør med eventuelt vedlegg av tilbud.
Konto /bygg som skal belastes.
Mengde varer.
Avtalt pris der det er oppgitt.
Vedlegg av spesifikasjon.
Ønsket leveringstid

- **Leverandørliste Nybygg**

Dersom det ikkje er vedlagt ein "Makers List" ved kontraktinngåing på nybygg, skal Havyard komme med forslag som må gjennomgåast og godkjennast med Rederi.
Det skal leggast vekt på eit tilstrekkelig og representativt antall av kvalifiserte tilbydarar.

- **Innkjøpsplan**

Det skal lages innkjøpsplan ifbm alle nybygg, dvs. definere liste med innkjøpsposter (SFI.nr) for prosjektet og spesifisere ønska leveringstidspunkt i henhold til signert spek.
Innkjøpsplan med oversikt over kjøpte/ bekrefta/ leverte varer skal oppdaterast kvar veke og leggast i nybyggingsarkiv.

Rev:

Innkjøpsprossesen

2. **Prosessen**

- **Forespørsel**

Det skal normalt hentes inn min. 3 tilbod frå leverandørar.
Unntaksvis kan ein leverandør aksepterast ved følgende tilfeller:
a) Kunden eller kontrakten vedr.pris og leveringstid krev ein bestemt leverandør
b) Det er ikkje mulig å innhente tilbod frå fleire leverandørar.
c) Antatt kostnad bør være over kr.10.000.- før ein formelt forespør fleire leverandører.

Forespørsel skal sendast potensielle tilbydere enten via forespøseldokument pr. mail, eller via mail/tlf.
Alle tilbydere skal ha samme informasjon.
Åpen forespørsel skal inneholde:

- Prosjektreferanse (bygg nr)
- Tekniske krav / ytelse/ tegninger
- Antall
- Ønska leveringstid
- Tilbudsfrist
- Kontaktperson
- Liste over vedlegg

- **Val/ evaluering av aktuelle tilbydarar**

Mottatte tilbod skal evaluerast både kommersielt og teknisk.
Tilboda skal gjennomgåast mellom teknisk kontaktperson og ansvarlig innkjøper.
Gjennomgangen skal omfatte ein vurdering av leverandørens produktspek opp mot Havyard sin kravspek.
Dei vel ut leverandørar som det er aktuelt a forhandle vidare med.

- **Forhandling**

Havyard skal forhandle med de mest aktuelle leverandørene for å komme fram til beste produkt, levetid, pris og betingelser.
Innkjøp er ansvarlig for forhandlingen og kaller inn teknisk personell etter behov.

Innkjøpsprossesen

3. Output

- **Kontrakt**

  Med bakgrunn i forhandlingsresultat skal det skrives kontrakt/ bestilling.
  Innkjøpsleder har ansvar for kontraktsutforming / utkast.
  Kontrakt skal / kan regulere følgende punkter:
  - Spesifikasjon av leveringsomfang.
    Kapasitetskrav, kvalitetskrav, opplæring og dokumentasjon.
  - Prisformat, betalingsplan, betalingsbetingelser
  - Leveringsplan, leveringsbetingelser
  - Leveringstid
  - HMS- Instruks ved arbeid på Havyard

  Kontrakt skal skrives ut i to eksemplar som undertegnes av begge parter.

5. Output

- **Fakturamottak**

  Mottak av korrekt faktura ihht ordre sendes økonomiavd for godkjenning.

Innkjøpsprossesen

4. Prosessen etter val av leverandør / kontrakt / bestilling.

- **Bestilling**

Alle innkjøp skal gå gjennom innkjøpsavdelingen og formaliserast med skriftlig bestilling i Visma.
Bestillingen skal inneholde bestillingsnr, antall, spek, pris og leveringstid.
Ordren sendes til leverandør pr. mail / faks.

- **Ordrebekreftelse**

Innkjøpsavdelingen skal ha ordrebekreftelse på alle bestillinger som sjekkes opp mot ordre. Ordrebekreftelsen registreres i Visma med riktig pris og leveringstid.
Innkjøpsplanen for nybygg oppdateres.

- **Varemottak**

Varer blir levert varemottak Havyard Ship Technology, Leirvik.
Mottaker skal kontrollere at godset er uskadet og antall kolli stemmer med fraktbrev.
Evt merknader skal noteres på fraktbrev og attesteres av transportør.

- **Ferdigmelding**

Mottaker sjekker videre at varen stemmer overens med pakkseddel /ordre og ferdigmeldes i Visma.
Rekvirent / bestiller varsles om at varen er mottatt.
Lagring / utlevering til rekvirent / bygg.

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Appendix 5 – Display of Purchasing Process at Havyard