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Learning within aftermarket development

A gap analysis at Volvo GTT

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Master of Science Thesis in Quality and Operations Management

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Abstract

In a market where value creation is moving from manufacturing and selling a product toward selling a total offer, knowledge has become an even more valuable asset than before. Facilitating learning and the spread of knowledge has thus become vital for organizations.

Historically Volvo Group Trucks Technology (Volvo GTT) has acted on knowledge management from previous learning but is now looking for new ways in understanding, maintaining and improving learning within the organization. In a new organizational structure, this is one of the key challenges that need to be handled. Until now, learning within different roles of the organization has been an unexplored area and thus attempts to improve it have been difficult to initiate and even more difficult to execute successfully. This research aims to increase understanding of how learning takes place in Aftermarket Technology (AMT), a department within Volvo GTT, and compare it to how the company claims to approach situations where learning occurs.

Data obtained through continuous observations and semi-structured interviews was compared to theory and a gap analysis was conducted by comparing how the company claims to be handling learning and how they actually handle learning. Workshops were held to verify the data and other organizations were visited to see how they handle learning to provide inspiration to recommendations through best practices. For a mutual learning process of researchers and organization's employees and managers, findings from the research, as well as a general description of how the authors perceive the aftermarket organization have been presented to the organization on a regular basis in parallel with the investigation and analysis.

Four main focus areas found to affect learning in the organization in general and tacit knowledge sharing in particular have been identified through the interviews with employees. These areas made up the foundation of the gap analysis when compared to the company's description of the own values and behavior. The areas are knowledge networks created by employees to access colleagues relevant for their deliveries, feedback which creates triggers to what needs to be done in the work environment, reflection which leads to learning by interacting or individually reflecting upon previous experience and finally the measurements used to evaluate work progress since they set the rules and the value of learning activities.

Conclusions and recommendations based on these areas and the gap analysis aim to direct the organization on how to focus further projects and investigations as well as suggest further benchmarking and applications of best practices.

Keywords:
Organizational learning, individual learning, knowledge sharing, tacit knowledge, feedback, reflection, knowledge networks, culture.

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"*There are no checkpoints. There are no roadmaps.*
That's how the future looks, and the question is:
Are you prepared to meet that future right now?
If you start running in the wrong direction, you will finally end up lost."

- P. Nilegård -

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1. Introduction

The introduction provides a background of the research area also containing a description of the problem addressed. The case company, Volvo Group Trucks Technology, is introduced as well as the Aftermarket Technology department.

Around 20 years ago researchers started to pay increased attention to learning within organizations and it became considered a “key factor in achieving sustainable competitive advantage“ (Dyer and Nobeoka, 2000, p. 345). In a fast changing business environment with an increasing level of complexity in terms of technological changes and globalization, an ongoing organizational learning is more crucial for productivity and effectiveness than ever for organizations to achieve strategic goals and remain competitive (Lopez et al., 2005; Campbell and Armstrong, 2013; Teece et al. 1997).

The focus of companies is strongly on creating “knowledge for action” but not for learning and creation of knowledge for future use (Argyris, 1993). Technical infrastructures are built up in organizations, supporting the creation, retention and transfer of knowledge and focus on developing solutions for job design, faster deliveries and inventory control to name a few examples. This focus on technical problems tend to neglect taking the social and cultural aspects of the organization into account (Javed, 2012). Rather than having managers follow a decision-making framework, Gourlay (2006) proposes management to treat knowledge as something that can only be managed indirectly through influencing the behavior of employees and thus steer them toward actions that in turn benefit knowledge sharing.

The company of study, Volvo Group Trucks Technology (GTT), is challenged by the market to move from developing and selling trucks to developing and selling "uptime" and a "total offer". Hence, something like maintainability of a truck has moved from being only a feature for the customers to become an internal cost like manufacturing for Volvo. Through the service contracts that are sold with the trucks, service and repair is paid for in a similar way as for assembly in the factories. In a market where value creation is moving from manufacturing toward selling services, knowledge has become even more valuable asset than before. The object of study in this thesis is Aftermarket Technology (AMT), which is the department within Volvo GTT responsible for areas like maintenance and spare parts, among others.

In this new context of selling a total offer, the creation and flow of knowledge within AMT and between other parts of Volvo GTT needs to be as efficient as possible so all relevant data reaches the right instances within the company and is easy to understand and act upon for the individual employees. Facilitating learning and the spread of knowledge is thus vital in order to make people contribute to the continuous improvement the company wishes for. Historically, the company has acted on traditional knowledge management but is now looking for new ways in understanding, maintaining and improving learning in the organization. In a new organizational structure, this is one of the key challenges that needs to be handled.

One of the most influential factors of organizational learning is the organizational culture. It can be one of the main obstacles when it comes to the flow of knowledge (Ruggles,1998). Investigating cultural aspects is challenging, but coming from outside the company brings a huge advantage since you are not colored by it yourself. When entering an organization from the outside it's possible to observe what's happening without preconceptions of why, while asking people inside the organization about its culture can be compared to asking a fish what water is, like Schein (2009) puts it.

This thesis is about investigating learning at the case company, with aspects of corporate culture in mind. To compare the espoused values of an organization to how employees perceive their daily activities is an unusual approach in a master thesis. This different angle to review organizational performance and identify strengths and improvement areas provide both an academic contribution through the unconventional analysis method as well as a practical contribution to the company studied.

1.1. The Case Company

Volvo GTT is one of Volvo Group's nine main business areas. The business units' responsibilities covers the entire value chain from long term research and product planning to the deliveries of complete vehicles as well as aftermarket services and support. Around 10 000 employees are working for Volvo GTT, mostly engineers. They work in global teams with offices, workshops and laboratories around the world. In 2013, the company delivered 200 274 trucks.

Volvo Group has now decided to move from developing and selling trucks to developing and selling uptime and a total offer. Maintainability has then changed from being only a feature for the customers to being an internal cost. Through the service contracts which are sold with the trucks, service and repair is paid for in a similar way as for assembly in the factories.

1.1.1. AMT

AMT is a sub department of Complete Vehicle, which is one of Volvo GTT's seven areas. AMT is located in five different countries and provides support to the aftermarket business in terms of solutions and services for mechanics and workshop personnel at dealerships and other service points worldwide. The department is divided into five divisions; Spare Parts Engineering and Information (SPEI), Service Engineering and Information Management (SEIM), Diagnostics Engineering (DE), Maintainability- and Operational Excellence Management (MOEM) and Aftermarket Project Office (AMPO).

SPEI develops spare parts and keeps track of spare parts assortment, SEIM develops repair methods and instructions for mechanics, DE maintains and develops the truck software and diagnostics tool, MOEM works for an AMT integration early in projects and AMPO provides the project managers representing AMT in cross-functional

projects. If the needs of AMT are not taken into consideration when developing new trucks, there will be huge problems the day the truck breaks and comes to the workshops for repair.

1.2. Purpose

The overlying purpose of this thesis is to establish an understanding of how learning could be improved at AMT. By understanding how learning occurs and what affects learning in AMT, areas for possible improvements can be identified together with strengths of the organization to utilize. A continuous learning process together with AMT throughout the research is also an important contribution, including recurring meetings with supervisors as well as participation and presentation of the work progress at meetings and workshops.

The purpose in terms of deliveries is to present to AMT where they are today regarding learning and how they could focus future efforts to become wiser within areas where employees think their learning could be facilitated and in the long run improve learning. Finally, the purpose is also to provide advices and recommendation about applying best practices from other organizations, considered good at learning, visited during the process.

1.2.1. Research questions

The research question and three sub-questions were worked out together with the contact persons at AMT and the supervisor at Chalmers and have acted as a roadmap throughout the research process. They are deliberately formulated to deliver descriptive answers, to stay in line with the purpose of the thesis. The questions are:

How can learning improve at Aftermarket Technology?

How does learning occur within AMT today and how has it changed over time?
In order to apply theory and get an overview of the organization, it's necessary to know how the learning processes look today and how they have changed over time to see what the trends are in the company.

What is facilitating or hindering learning at AMT?
Understanding what affects learning within the organization, both positively and negatively, is important to deal with the challenge of changing the way to treat learning processes.

How can AMT learn from other companies to improve learning processes?
Looking at companies considered successful in learning can be a good source of inspiration when analyzing how it could be improved at AMT. Though, the possible differences in culture between AMT and the compared actor need to be considered.

1.3. Scope and Delimitations

The part of the research conducted at Volvo GTT is concentrated to AMT only and the in-depth interviews were further focused within three divisions of the department. Thus, information of how AMT works toward other departments within the company is the version of AMT employees only and hasn't been verified with the people it might concern elsewhere. All interviewees were held in Gothenburg and there could possibly be different answers to certain questions when talking to people from different national cultures also working for AMT.

When interviewing people from other companies, the image of their company delivered through the interview data was based on the interviewees' descriptions of how things should work there. It was never validated by also interviewing other employees at the company, mainly due to the time frame of this thesis work. However, the data and findings are still considered interesting and useful as sources of inspiration for AMT.

Deliveries are not supposed to be clear recommendations for how to do to improve right away. Such conclusions would require further research from different angles within the company, but hopefully this thesis can be used as a foundation when making progress in the important area of learning. Since the purpose of the study is to deliver recommendations for future studies rather than solutions, focus has naturally been on understanding the context in which learning happens. A research that includes both obtaining a full understanding of learning processes as well as coming up with actionable suggestions of solutions would not fit within the timeframe for this kind of thesis.

2. Theoretical framework

The purpose of this chapter is to present the main theories relevant for the research. It covers the main characteristics of learning, the role of it in an organization and what impacts it. Further, different views of knowledge are introduced together with theory of how it can be handled. Corporate culture and the framework used to map and understand is explained and finally old master theses conducted in a similar context as this one are summarized.

2.1. Learning

Organizations are increasingly paying attention to the concept of organizational learning. It is believed to be a fundamental source of competitive advantage within the strategic management context in organizations (Lopez et al., 2005, p.227; Campbell and Armstrong, 2013).

No matter if organizations consciously choose to or not, they all learn. Some of them encourage learning by making focused efforts on developing capabilities while others make less effort in facilitating learning and as a result acquire counterproductive habits (Kim, 1993). Carrol et al (2002, p. 3) define learning as "a change in condition-action linkages" and organizational learning as an "analogous change at an organizational level". According to Argote (2013, p. 31) organizational learning is a "change in the organization´s knowledge that occurs as a function of experience" and as Carrol et al (2002, p. 89) state: "Whereas learning is a process of change, the content of that process, the condition-action linkages, is knowledge.". Argyris (1976, p. 365) describes learning as the process of the detection and correction of errors: "Error is a mismatch: a condition of learning, and matching a second condition of learning. The detection and correction of error produces learning and the lack of either or both inhibits learning.".

Argyris (1976) distinguishes between two forms of learning - single loop learning and double loop learning. He argues that people tend to define learning to narrowly or only as "problem-solving" and mainly focus on detecting and correcting errors from the external environment. He calls this single-loop learning. In single loop learning the organizations fundamental design, goals and activities are not questioned and the person does not really reflect on the underlying reasons for the mismatch.

On the other hand, the double-loop learning requires the learners to reflect on a deeper level. They questions the role of the learning systems, underlying goals and strategies as well as looking inward and reflecting upon their own behavior and criticize themselves in order to change their own behavior and reactions (Argyris, 1976).

For a comparison of single- and double loop learning, Argyris and Schön (1978) used a thermostat as a metaphor. Single loop is compared to a thermostat that receives information about temperature and automatically turns the heat on or off when the temperature reaches certain limits. However in double-loop learning the thermostat asks "why?". It questions why it is set to a temperature or examines why it works in a certain

way and explores whether another temperature might achieve the goal of heating the room in more economically way (Argyris and Schön, 1978; Argyris, 1976).

Another way to explain the difference between single- and double loop learning is through the cycle of experience (figure 1), similar to an extended PDCA-cycle (Plan Do Check Act) described by Scheinberg (2013).

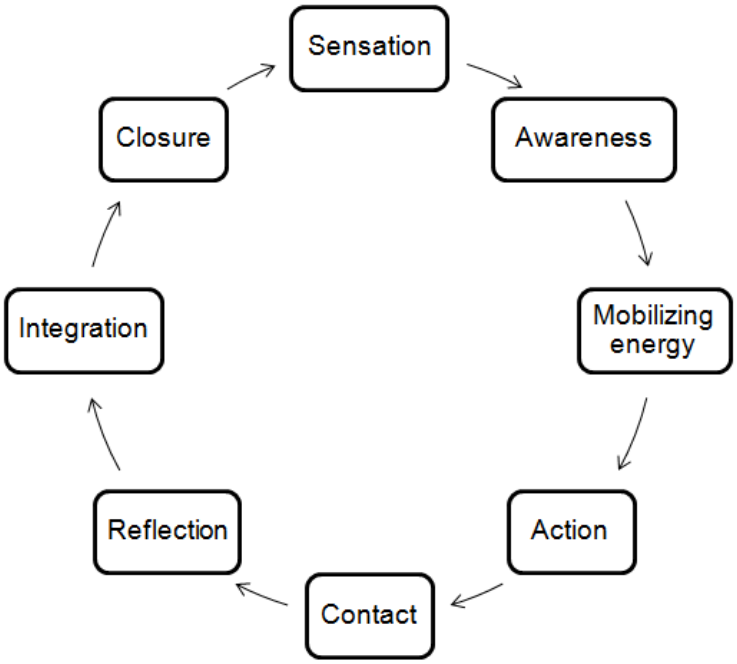

Figure 1. Cycle of experience (Scheinberg, 2013)

The first stage, sensation, is when symptoms of a problem are discovered. In single loop learning, a leap directly to the action stage where a solution is executed is done and then the problem is left behind. This is also described as a non-conscious way of working (Scheinberg, 2013) where important stages that would be carried out in a double-loop learning process, going through the whole cycle, is skipped. Those include the awareness stage where a root cause analysis is conducted and the mobilizing energy stage where teams are formed and measurements to evaluate the outcome are set (Scheinberg, 2013). Since the action stage is the final stage in single loop learning, *contact*, reflection, integration and closure are not performed either. Contact is a continuous process throughout all stages of the project where progress in relation to the goals is reported and discussed with different stakeholders, while reflection is when the work is evaluated and results and experiences are written down (Scheinberg, 2013). The final two stages are really important, since the integration stage is where the new way of solving the problem is standardized and ensures a prevented repetition of errors and the closure stage is when the learning process is finished rather than ending up in an accumulating pile of unfinished projects. (Scheinberg, 2013).

2.1.1. Learning and change

Schein (2009) describes what he refers to as stages in the process of learning or change. The core of the model is that adult learning, unlike when children learn things new to them, contains a first stage where old knowledge has to be *unlearned* in order to make room for the new knowledge. The model was first introduced by Schein (1996) and builds on the theories of Kurt Lewin, a famous psychologist, although Schein (1996) chooses to refer to what Lewin calls "planned change" as "managed learning".

This first stage of the model is called *Unfreezing* and is when the motivation to learn or change is created. Schein (1996) states that *"it is my belief that all forms of learning and change start with some form of dissatisfaction or frustration generated by data that disconfirm our expectations or hopes"*. Examples of disconfirming forces are mentioned and among those are new technologies, leadership, education and training (Schein, 2009).

However, this data is ignored if it is considered not valid or irrelevant, so the fact that it exists is not enough to trigger a need to learn on its own. It also has to be perceived as serious enough to create a feeling of so called *survival anxiety* or *guilt* (Schein, 2009). In this phase, a feeling has grown that things won't turn out well unless you react to improve or adapt in some way. When the need to change is realized, the next step is to deal with the *learning anxiety* related to the fact that it takes effort to learn something new. Schein (2009) presents two principles for change managers to help get past people's resistance to change and create the psychological safety needed to enter the next stage of learning. First, either the *survival anxiety* or the *guilt* must be stronger than the *learning anxiety* and second the *learning anxiety* must be reduced rather than increasing the *survival anxiety* (Schein, 2009).

The second stage is labeled *Learning new concepts and new meanings for old concepts* and Schein (2009) states that by either identifying and imitating a role model or through trial-and-error problem solving, that learning is achieved. The first implies that people now realizing their need to learn and change get in contact with others who have already embraced the relevant learnings. That approach facilitates increased interaction among people and therefore acquiring of tacit knowledge. This approach is useful when what to learn and how to change is clear and can be supported by change managers as a part of training (Schein, 2009). Though, imitation is not always possible due to differences in personalities and once the role model is not there anymore people might go back to their old behavior (Schein, 2009). Secondly, to achieve a learning process that better fits with individual personalities, the author suggest the trial-and-error learning where people themselves find out how to reach the goal**.** By doing that and inventing their own solutions until something works people risk losing the tacit aspect acquired by observing from others and learning norms of behavior (Argote, 2013; Brown and Duguid, 1991). Individual training has also proven to be less effective than training with others as it promotes a development of so called "transactive memory system" which is a system for encoding, storing and retrieving information developed by a group and

each person within the group is responsible for remembering only a certain part of the information (Argote, 2013). The importance of a clear goal is important for both strategies and Schein (2009) stresses the importance for change managers to keep clear what the ultimate goal is since people have different ways of getting there.

The final stage of the model is called *Refreezing* and is when new concepts and meanings are internalized (Schein, 2009). It means that a new way of working or thinking cannot be considered a learning until it has become internalized, which is when it has become the new standard for how to approach similar situations. Though, the new behavior that is a consequence of the new mindset has to fit in with the ongoing relationships and social context in which tasks are being performed. Otherwise, reverting to old behavior is likely in order to maintain group membership (Schein, 2009).

The dynamic capabilities of a company, i.e. a company's ability to adjust to a rapidly changing environment, is a key factor also when it comes to the ability to innovate (Teece et al., 1997). Learning is central for the dynamic capabilities, and Teece et al. (1997) describe learning as enabling to find new business opportunities as well as finding new understanding of and solutions to complex problems when people collaborate. Zollo and Winter (2002) state that the dynamic capabilities of a company are shaped by the accumulation of experience within the organization, knowledge articulation (creation of new knowledge through merging of previous knowledge) and the process of knowledge codification. All three are referred to as learning mechanisms and the latter two as consequences of reflection upon past experiences (Zollo and Winter, 2002).

According to Argyris (2002) market success is increasingly becoming dependent on learning. Despite that most people don't know how to learn and furthermore very few companies are aware of that. Even individuals with the highest education and commitment, also in the key leadership positions, are in general not good at learning. He points out two common mistakes individuals tend to make about learning. He states: "Highly skilled professionals are frequently very good at single-loop learning" and refers to the first mistake they tend to make which is defining learning too narrowly and focusing only on errors from the outer environment and problem solving. "After all, they have spent much of their lives acquiring academic credentials, mastering one or a number of intellectual disciplines and applying those disciplines to solve real-world problems. But ironically, this very fact helps explain why professionals are often so bad at double-loop learning" (Argyris, 2002). He says that many professionals don't know how to learn from failures and one of the reasons is that in general they have been quite successful at what they do and therefore never learned how to learn from failures. They tend to avoid criticism, be defensive and try to blame someone else for mistakes. That sheds a light on the second mistake often made in learning, the tendency to think about learning as a matter of motivation and that with the right attitudes and commitment, people automatically learn. In order to increase employees' motivation and commitment

companies therefore tend to focus too much on organizational structures like compensation programs, performance reviews and company cultures.

2.1.2. What can affect learning?

Høyrup (2004) uses a similar argumentation as Argyris and Schön (1978) when he distinguishes between two different kinds of reflection - reflection and critical reflection. He describes reflection as a mental activity that focuses on presenting details of a problem or a task. It aims to investigate an action in a situation and involves a review of an experience and analysis of causes and effects where conclusions are drawn concerning actions for the future. On the other hand, critical reflection concerns the *why* of an action and questions the social, cultural and political aspects which a task or a problem is situated in, but not the *how-to*. While reflection may imply knowledge reconstruction, a critical reflection involves changes in the psychological mechanism which is our base for the interpretations of the world (Høyrup, 2004).

Anseel et al (2009) investigated how reflection affected organizational performances and the results showed that reflection does enhance performance improvements. However, reflection alone does not lead to these improvements. The investigation showed that reflection without feedback did not lead to a performance improvement. Furthermore they showed that a feedback and reflection combined enhanced performance improvements better than feedback alone. This line of thought is also supported by Scheinberg (2013) and the theory around the cycle of experience, where all steps have to be went through in order to complete the learning cycle and standardize an improved way of working in a certain situation.

In order to learn from previous actions employees need the space and time to receive supportive feedback from relevant sources, such as managers, co-workers and customers, to reflect on how and what they are doing in their work on a learning mode (Anseel et al., 2009; Høyrup, 2004). But how much feedback is relevant? When there is a low feedback frequency, individuals have less information to use to improve their performance at work but on the other hand, increased feedback can lead to individuals becoming overwhelmed. It can increase tension and anxiety and thereby their ability to perform tasks can be impaired (Lam et al., 2011).

Lam et al., (2011) studied this curvilinear relationship between feedback frequency and individual task performance. Previous research have suggested that a frequent feedback can improve learning and performance but the authors questioned the effects on employees if feedback was given too frequently. Feedback comes in a different forms from different sources and focuses on different performance aspects. At the same time individuals are differently disposed in seeking and incorporating feedbacks. Thus different factors play a role in both effectiveness of and optimal frequency of feedbacks. Jackson et al. (2003) point out that psychological factors, like the personality and daily shape of the feedback receiver and the feedback giver can play a significant role as well as the timing from the finishing of the task compared to the level of the performance. A

feedback inquired by a performer shortly after poor task performance might for example yield more positive feedback than if he waited for a spontaneously offered feedback later on (Larson, 1989).

Customer feedback can be categorized into active and passive feedback. With active feedback tools, customer responses are solicit, e.g. with satisfaction surveys, which can then tie to an employee performance evaluation. In contrast to active feedback tools, the passive feedback relies on the customers to report their experiences on their own by complaining, giving complements or suggest changes or improvements (Wirtz and Lee, 2003; Mattila and Wirtz, 2004).

Several researches have studied the effects of members' diversity on learning, in terms of e.g. different educational background, competences, position and cultural background have been made but with different outcomes and conclusions. While some researchers conclude that diverse teams learn more from projects, others mean that increased team diversity has negative impact on the organizational learning (Argote, 2013). Also there have been several investigations about how team stability contributes to organizational learning. Most researchers agree on that teams with low member turnover contribute positively to learning as members familiar with each other may have better developed routines and coordination in interdependent work, which often is tacit and therefore difficult to share (Argote, 2013; Edmondson et al, 2001). However, other researchers push the fact that a higher turnover contributes to the innovativeness of a group by bringing in new ideas and ways of thinking to it (Etzkowitz and Leydesdorff, 2000).

2.2. Concepts of knowledge

Knowledge is a broad concept with various different interpretations and here the views of it used in this thesis as well as how it can be dealt with are presented.

2.2.1. Tacit and explicit knowledge

Knowledge is created by interaction of two types of knowledge called explicit knowledge and tacit knowledge, a concept first introduced by Polanyi (1958). Explicit knowledge is a knowledge that is communicated in a formal and systematic way. It has been articulated and codified and can be easily stored, transmitted and processed in a form of such as data, scientific formulae, specifications and manuals. On the other hand, tacit knowledge is not as easily expressed. (Nonaka et al. 2000). Tacit knowledge is a knowledge that can be learned by experience or practice. It is not written down and is therefore not found in manuals, books, databases or files (Smith, 2001). It is highly personal and it can be difficult to formalize and communicate it to others (Nonaka et al. 2000).

As examples, explicit knowledge can be a knowledge somebody takes in by reading a manual but a tacit knowledge can be knowing how to ride a bike, without being able to explain exactly how to keep the balance. Nonaka (2000) emphasizes that explicit and

tacit knowledge are complementary. and that explicit knowledge without insight from tacit knowledge can easily lose its meaning. As seen in figure 2 the explicit knowledge may be viewed as the visible tip of an iceberg, such as data, documents and files or *knowing-what* but the tacit knowledge is the thinking behind it or *knowing-how* (Nonaka et al. 1998; Nonaka et al. 2000).

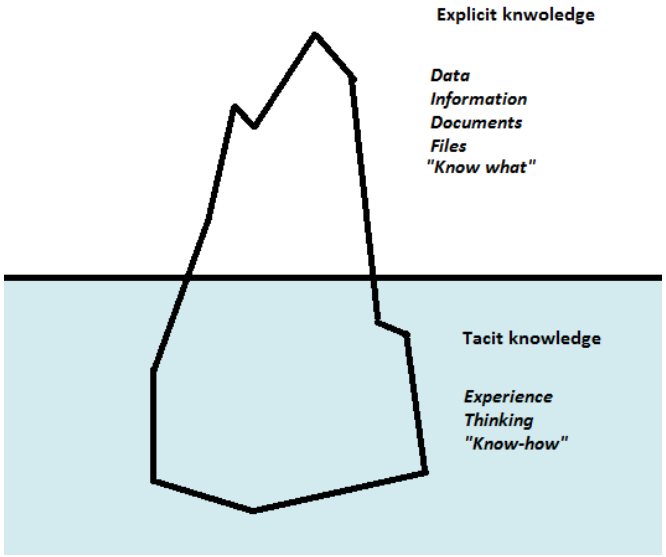

Figure 2. The explicit knowledge can be seen as the visual tip of an Iceberg.

2.2.2. Personalization and Codification

Hansen (1999) analyzed firms in the consulting-, healthcare and technology environment and thereafter divided knowledge management strategies into two categories. One is called a codification strategy and the other is called a personalization strategy.

A codification strategy is when knowledge is codified and stored in databases so it can be easily accessed by employees. This can be all kinds of data or information in different forms, such as documents or manuals. The codification allows people to search for knowledge without contacting the person who developed it originally and reuse that knowledge (Hansen et al, 1999). On the other hand, the personalization strategy is where the focus is on people and knowledge is shared mainly through direct contact between the people. The goal is to facilitate the sharing of tacit knowledge between the one that has the knowledge and the one that seeks the knowledge, not only face to face but also with other ways of communication such as phone, e-mails, video conferences. (Hansen et al, 1999).

2.2.3. Knowledge sharing

Nonaka (1994) assumes that knowledge is created in a spiraling process through the conversion between tacit and explicit knowledge and calls it “knowledge conversion”. He identifies four patterns of the interaction involving tacit and explicit knowledge. They are socialization, internalization, externalization and combination, proposed in a spiral model, SECI, which represents different ways of how existing knowledge can be converted into a new knowledge. In the model these four “modes” of knowledge conversion are postulated;

1) Socialization: Tacit knowledge to tacit knowledge. 2) Externalization: Tacit knowledge to explicit knowledge 3) Combination: Explicit knowledge to explicit knowledge. 4) Internalization: Explicit knowledge to tacit knowledge (Nonaka, 1994; Nonaka et al. 2000).

The spiraling process in Nonaka’s model (figure 3) illustrates how knowledge transfer should be seen as a continuous learning process and constantly move into a deeper level of knowledge. New knowledge starts with an individual’s personal knowledge and is transformed into an organizational knowledge which then can expand through a company and become a value for others in the organization. Making personal knowledge available for others in organizations should be the central activity of knowledge and innovation companies. (Nonaka, 1994)

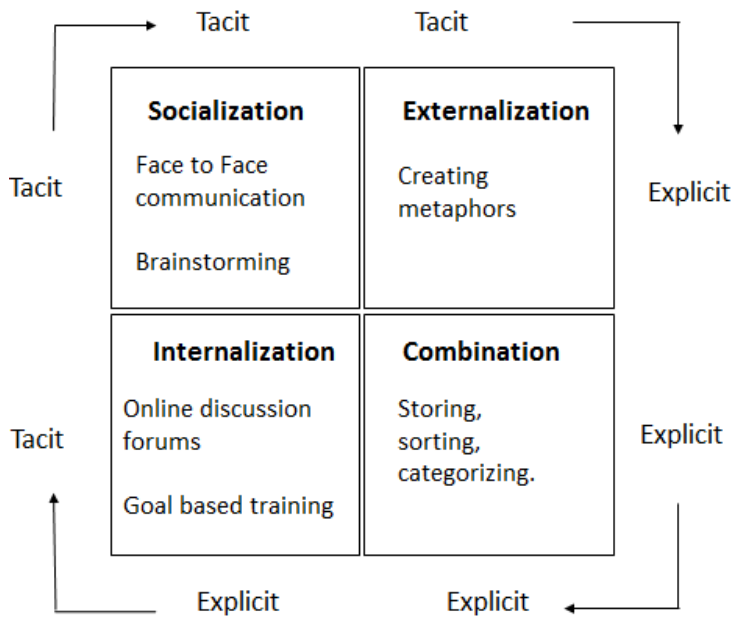

Figure 3. A matrix of the four patterns of the interaction involving tacit and explicit knowledge including examples.

Like Nonaka (1994), Argote (2013) views organizational learning as an ongoing cycle. Organizational learning occurs in a context that can be divided into the organization and its external environment. The environmental context includes factors such as its clients,

competitors and governments but the organizational context consists of the characteristics of the organization such as its structure, culture and strategic goals and also relationships with other organizations like alliances, joint ventures or memberships in associations (Argote, 2013). Argote and Miron-Spektor (2011) differentiated organizational context into an active context and latent context. The active context includes the members and tools of an organization and the latent context is what can influence the active context, like the culture or strategy, but does not directly contribute to the tasks. The interrelation between the members, tools and tasks are the primary mechanism in which learning and the creation, transfer and retention of knowledge occurs. Thus, networks of people sharing knowledge and helping each other solve problems, so called knowledge networks, are important facilitators of innovative activities in a company (Chassagnon and Audran, 2011).

Paulin and Suneson (2012) have reviewed knowledge management literature considered to be among the most influential trying to make a clearer distinction between two terms used to describe knowledge flow; knowledge sharing and knowledge transfer. The authors found that what term is used depends on the view of knowledge presented, separated into two different perspectives which are the knowledge as an object-perspective and the knowledge as a subjective contextual construction-perspective. In the former, knowledge is treated as something explicit that you can put into a structure, store and retrieve, while in the latter knowledge is treated like something that is created in a certain social context and cannot be separated from it without being distorted since it is affected by the interpretations of individuals. In literature with the knowledge as an object-perspective knowledge transfer is concluded to be the term of use, and in works with the knowledge as a subjective contextual construction-perspective it's rather referred to as knowledge sharing (Paulin and Suneson, 2012). Knowledge barriers are also brought up in the paper, and how the different approaches toward knowledge and the flow of it affects how these barriers are dealt with. When trying to overcome barriers with knowledge transfer Paulin and Suneson (2012) suggest identifying and amplifying the enablers of knowledge flow while trying to suppress the obstacles as the straightforward way for improvement. With knowledge sharing it is a bit trickier and the challenge is rather to develop an environment that better fits the individuals who are going to act in it in order to make the knowledge flow happen (Paulin and Suneson, 2012). Also the physical environment can be important and Sarkissian (2014) points at how the layout of the working place can facilitate or hinder the flow of information. An innovative work place and environment can both improve communication and boost productivity, while a bad design hurts job satisfaction and leads to frustration.

2.3. Culture

When looking into an organization and how people act within it, it is important to also try understanding the context in which they are acting and the influence it has on their behavior. Thus, literature about how to decipher culture and understand the impact it

can have on everyday work as well as in the change process where learning is central has been studied.

Schein (2009) describes different ways to investigate and analyze the culture within a company or an organization in his book The Corporate Culture survival guide. He claims that an investigation of culture is hardly interesting in its own right, but rather has to be related to a specific organizational problem or issue. That being said, the impact of culture on that issue is often necessary to deal with.

Schein (2009) presents a framework where culture is divided into three different levels based on complexity; artifacts, espoused values and underlying assumptions:

Artifacts are described as the things you as someone outside of and not contributing to the culture can observe, like the way people dress or how they talk to each other. It's the way things are actually taking place, but doesn't tell why they are the way they are.

The espoused values are how the organization describes itself to the world, in line with the image they want to mediate. Examples of such can be shared values, policies, formal dress codes or role descriptions.

Underlying assumptions are referred to as being the unconscious beliefs, shared and taken for granted among people within the organization. This can be the original assumptions of the founders of the company that made the business successful in the beginning and once it started to grow and develop these values were carried along and became tacit cultural features. Understanding these is important to be able to explain the deviations between artifacts and espoused values that most likely will show up when investigating culture.

Schein (2009) states that the key elements in the corporate culture can act as big obstacles when an organizations stands before a process of change or when new learnings are to be brought in, especially for older companies in mature industries. He claims that companies tend to grab on to what once made them successful with all force they have. This path dependency seriously hurts the ability to innovate. This reasoning is also supported by Teece et al. (1997).

2.4. Previous research

To get an overview of what research have been done recently in a similar field, a sample of master theses conducted by students in the Gothenburg area and presented in 2012-2013 were analyzed. Two of the theses were selected by the company contacts as representative for the relevant area and complemented by another recommended by the Chalmers supervisor.

The three theses analyzed were Sharing knowledge creates better knowledge by Ivdal and Mankert (2013), Learning what you already know by Berntsson and Regnander-

Bergh (2012) and How to Support and Facilitate Knowledge Flow in Product Development at Volvo Group Trucks Technology by Ghaedian and Chen (2012).

The main purpose with the thesis by Ivdal and Mankert (2013) is to investigate knowledge transfer in the context of a multi-national company and how knowledge can be developed through interaction between sites active in different geographic areas. To achieve a deeper understanding, the authors visited facilities in four different countries and conducted interviews with managers there. Learning is throughout the thesis referred to as something people within an organization need to have a desire for in order to actively create knowledge. The importance of social interaction in order to transfer and develop tacit knowledge is discussed and described as a cornerstone for 'intra-organizational relations' together with social relations and social networks. The importance of managers in creating and facilitating a knowledge-creating organization is investigated and concluded to be crucial. Together with the intra-organizational relations and the personal dedication of employees to create knowledge it is described as the most important facilitators for a knowledge-driven organization acting internationally.

Berntsson and Regnander-Bergh (2012) present a rigorous theoretical framework presenting various author's view of learning and knowledge. Their task from the company at which they were doing their research was to investigate the current procedure for storing of knowledge generated in projects and also to deliver a specification for a possible IT-tool facilitating this process and the reuse of the knowledge created. A series of shortcomings with the current post-project review method to store knowledge were identified through interviews. The documentation often appeared to be flawed and hard to access, due to the fact that both the structure for how to make it as well as the incentives for employees to make it in a good way were lacking. Since this documentation made up a major part of the knowledge preserving activities at the company, 'a negative loop of working with lessons learned' occurs when it's inferior. With this information the authors were able to develop a specification for the IT-tool to support and improve the process. The intention was to use it continuously during projects and also to develop it during the work process to make it evolve together with the processes to achieve a good fit.

Ghaedian and Chen (2012) focus on knowledge flow in a lean environment and the research is conducted within the Product Development department in their company of study. The authors use an extensive theoretical framework, in which both learning and different aspects of knowledge is brought up as well as how culture can affect knowledge sharing. They also used interview data to form suggestions and deliver conclusions regarding how the company can act within different areas to improve the knowledge flow. The focus areas are methods and mechanisms enabling knowledge flow, what organizational structure that would be most beneficial and what cultural aspects that need to be considered when trying to facilitate it. They deliver recommendations of solutions for identified issues hindering knowledge capture, knowledge sharing and the reuse of knowledge. The recommendations consist of

models and frameworks as well as checklists and direct advices for the company to use and implement, together with recommendations for further areas of study.

To clarify how our thesis can contribute with a new approach to learning in an organization, similarities and differences between these master theses and the focus of our thesis have been studied. In general, the purpose from the company's side in master theses conducted in companies and businesses similar to the one in this research is to get some actionable data out of the project. Usually in the form of clear suggestions or a specification for some kind of Knowledge Management-tool. This is also supported to be the companies' regular desire by Dan Paulin, PhD at Chalmers (interviewed by the authors on the 28th of march 2014), who has supervised numerous master theses at companies like Volvo GTT. This pattern is repeated in the theses studied as well, although slightly less in the one by Ivdal and Mankert (2013).

What all theses studied have in common is that they have rigorous theoretical frameworks where learning has a central role, especially the thesis by Berntsson and Regnander-Bergh (2012). Though, when it comes to discussion, conclusions and recommendations it is obvious that learning has had to step aside to make a room for a more solution-oriented focus. The approach taken in our thesis, to rather present a situation assessment highlighting in what ways the company deals with learning today, how they present how they deal with it and how both relate to theory, can therefore be considered quite unique.

Tacit knowledge and the sharing of experiences through interaction between people is treated differently in the studied theses. Berntsson and Regnander-Bergh (2012) have the main focus on transfer of explicit knowledge. Tacit knowledge is paid attention by Ivdal and Mankert (2013), but only presented as one aspect to keep in mind in intra-organizational relations. Ghaedian and Chen (2012) criticize the way of investigating knowledge flow and deliver strong arguments for interaction as the main source of knowledge creation in an additional discussion section in the end of their thesis. They also put emphasis on the importance of finding the right people and that the company should facilitate this. How to build a network with others to ask when there is a need to rather than focus on transfer of explicit knowledge that can only be partly codified and partly contributing to learning for the reader is also brought up and discussed.

The aspect of corporate culture is not considered a main influence of the prerequisites for learning in the other theses, although it is being discussed by Ghaedian and Chen (2012). One reason can be that when the focus is on solving a certain problem, especially through creating/specifying a tool, the corporate culture might be considered absent, hard to control and too abstract in the context of the problem. In a more exploratory research like the one conducted in our thesis, neglecting the corporate culture would have been devastating since it affects everything that happens in the company environment. Thus, doing so brings in another dimension not widely incorporated into this thesis.

Looking at previous research has taught us that if you as a thesis writer is expected to deliver a solution to a specific problem within a certain time frame, it can sometimes be hard to stick to the preferred theories and that we with our more open approach will be able to do so.

3. Methodology

This chapter intends to describe and explain the research process and the choices of research design and methods. The collection and analysis of data are described, followed by a description of how issues related to validity and reliability are dealt with and how they contribute to the credibility of the final conclusions and findings of this research.

3.1. Research process

The process started by setting the scope for the thesis together with contacts at the company since the conditions were quite unspecified except that the research should be somewhat related to the knowledge management area and executed at AMT. A planning report presenting the scope, method and expected results for the thesis was then made.

During the first phase of the research, theory, mainly about learning, culture and knowledge was studied. In addition to that, other master theses, recently conducted within a similar field were studied as well as documents from the company describing how it should be acting in different areas. The theory was continuously complemented and updated throughout the research process.

Interviews were conducted at AMT in two stages. The initial stage interview data was then analyzed and made up the basis for the second interview phase. The data obtained was continuously analyzed and compared to the theory and also to how the company presents how things should be handled. In parallel with the final report writing and analysis, a minor benchmarking activity was initiated where representatives from three other companies were interviewed about how they do to facilitate learning. Finally two workshops were held. The first included participants from the second interview step and the second took place in connection to the final company presentation of the findings from the research in form of a discussion afterwards.

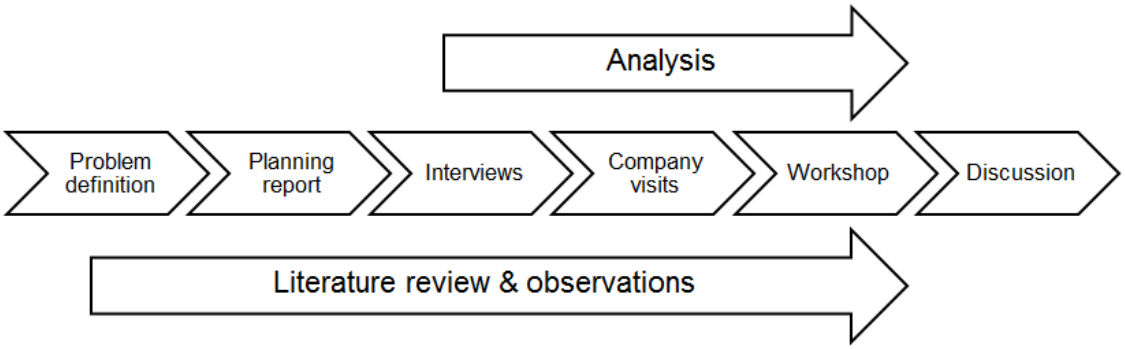

Figure 4. The research process illustrated

Throughout the process, findings from literature- and thesis studies as well as the thesis progress were continuously presented to employees and managers at AMT in meetings. That was a part of the mutual learning process and also a way of getting people‘s input

and participation. Then, an ongoing observation of the company's artifacts, as described by Schein (2009), took place during the whole process in order to understand the company's culture and environment.

3.2. Research design

The problem, as formulated initially, had unclear boundaries despite being about learning and knowledge management in AMT at Volvo GTT. Research questions were developed with a focus on describing how the situation looks today, although with some elements of how it has evolved through the years in order to get a feeling of in which direction the organization is heading. Thus, the research fulfills the requirements of a case study research design, as stated by both Benbasat et al (1987) and Bryman and Bell (2011). More specified, the research follows mainly a descriptive, qualitative case study with some influence from longitudinal case study to also catch the historical aspect (Bryman and Bell, 2011).

3.3. Research sample

A group of ten people from various departments of AMT were selected for the first interview round. The goal of the interviews was to get a broad understanding of learning within the department. After achieving this goal, three departments within AMT were chosen to focus on in more depth for the next interview round. A sample of seven people was chosen after analyzing the data from the first interview round with the aim of getting as detailed view of each of the departments as possible. The employees interviewed in-depth were on a similar level of the organization and none of them are full-time managers which can make the opinions obtained more in line with each other's than might be the case throughout the whole department. All of the second step-interviewees were invited to participate in the first workshop and four of them could attend. The group of people participating in the second workshop after the company presentation was not fully predefined. It was a mix of participants from the interviews, managers, the supervisor from Chalmers and employees with a general interest in the topic.

After the interview process, three companies were chosen for a benchmarking and application of best practices. The first company visited was RUAG Space. The high quality products developed and produced at RUAG Space had the biggest impact on the choice. As the products are unreachable after being put into use, RUAG Space is not able to service their customers afterwards in terms of repair and maintenance like AMT does with their customers. Consequently, the customer requirements are extremely high and the products expensive. The quality manager and an engineer from the company were chosen to be interviewed to get views from two different sites from the company.

Volvo Cars was chosen to be the second company to visit. Volvo Cars is in a similar business as Volvo Trucks in many ways, producing high quality vehicles although with a lower product and brand variety and a different customer base. They aim at making

learning becoming a standardized way of working and have been working with a program they call “lessons learned”. The corporate quality manager and process owner of “lessons learned”, who has 30 years experience from different sides of the company, presented the “lessons learned” program as well as presenting the company’s strategy in improving learning.

The third company was a global IT- and management consulting firm, but due to secrecy issues we decided to not mention it by name to avoid having to go through a long process of them reviewing and deciding what would be allowed to write in the report. The reason for choosing a consulting firm was that what they sell basically is knowledge and in order to be successful they must be good at learning and knowledge sharing within the company. The interviewee is a consultant working mainly with IT-systems. The interview was 45 minutes long and conducted over phone.

There are numerous factors that can influence learning and a lot of theory on the subject. When sorting out what to use in the theoretical framework a choice was made to stick mainly to well-cited writers and with a main focus on tacit knowledge sharing and learning related to it. The aspects of learning to focused on during in-depth interviews were chosen by combining theory and interview findings. Doing so, some other influences that could also affect learning have been left out in the analysis of the results due to the fact that they were not addressed during interviews.

3.4. Data collection methods

Pre-study

The literature study included books and scientific papers, mainly focusing on learning and corporate culture as well as data from the organization about the company values and goals that show how the company perceives and presents itself, eg. The Volvo Way (2009). The purpose was to create an understanding of the organization's view of itself and how to deal with the influence of corporate culture, as well as building a solid theoretical foundation for later research. In parallel, an analysis of findings from a sample of recent master theses conducted within the knowledge management area at Volvo GTT was made. The goal was to find recommendations on where contributions could be made, or areas left unexplored with possibilities of further investigation.

Interviews

After having acquired a basic understanding of the organization, what it stands for and its values the interview process started. To begin with, in order to increase the knowledge about AMT and how learning takes place there, ten semi-structured interviews with ten individuals from different divisions at AMT were conducted. Interview notes were taken during interviews, partly to save the huge amount of time that otherwise would be spent transcribing afterwards, but also due to the fact that being recorded might affect the interviewee as well as the attentiveness of the interviewers. This way of capturing data was used throughout the whole research, with the exception of one interview. All interviews were face-to-face and approximately an hour long,

except for one with a reference company which was done over phone during 45 minutes. By a regular participation in meetings and workshops with different parts and employees of AMT, the functions of different roles in the company were further clarified. It also led to an enhanced ability to see patterns and understand the information flows and learning processes, both how they look today and also what the trends are.

By interviewing the employees from different parts of AMT and analyzing the interview notes, a basic understanding of how learning takes place in AMT was obtained and after comparing interview data to theory, many opportunities for where and how to continue the research were identified. It was decided to put more effort on investigating a few people more thoroughly in order to capture in-depth descriptions, quotes and anecdotes from within the company.

In the first interview the focus was on understanding the roles and responsibilities of the interviewee and the main deliveries and contact persons. The remaining interviews focused on connecting theory to practice and understanding what really influenced learning and its preconditions. Also, during these in-depth interviews, semi-structured interviews were considered best to get the interviewees talking and using their own language, while it at the same making sure that the areas of interest were investigated.

This approach was also chosen for the interviews with the three reference companies, although time during the interviews there was also spent having the company representatives presenting how they work.

Workshops

The first workshop focused on four main issues from the analysis: feedback, reflection, knowledge networks and measurements. The four participants who all participated in the second interview step and representing all three different functions were divided into pairs. The focus areas were presented to them and then they got one question from each area to work on. They got twenty minutes to answer the questions and then presented their results to the others, followed by open discussions about the issues.

The second workshop was in connection to the final presentation of the master thesis at the company. After the findings from the research was presented, the audience asked questions and discussed the conclusions in the big group. It was an active and fruitful discussion where the diverse group of people in the audience brought up different perceptions of the problems discussed. Also areas and findings left out of the presentation due to time restrictions were brought up and discussed.

3.5. Data analysis methods

In the first interview round, where each person was interviewed once, the data gave the researcher a good foundation to compare to secondary data, which in this research consisted of scientific papers, books and old master theses and then prepare for the next round. During the second interview round, the data was analyzed and reflected upon

after each interview and used for making questions for the next interview. That means no interview was the same for any of the participants. After the interview process ended, all interviews were analyzed again and sorted into groups that were seen as main factors influencing learning at AMT.

The first workshop was held after the interviews had been analyzed and four main areas had been chosen to focus on. The groups spent 25 minutes answering questions about each focus area and had a poster presenting their findings. Everybody participated in the discussions afterwards. In the first workshop, the participants presented their answers to the questions and filled out A3 papers with main points on. During the presentations and the discussions afterwards, the main points were documented using computers and then used with the A3 for analysis. The second workshop was more of an open discussion where notes were taken both by researchers and supervisor, and the topics brought up were analyzed together afterwards based on those notes.

The same processes as for the interviews were used for the company visits. The interview data was written down using computers and reflected upon afterwards and combined with theoretical conceptualizations.

All research data was codified and analyzed with the goal to identify interesting areas/cases within AMT suitable for narrowing down into to further analyze how learning is taking place and where efforts to improve it could be made.

Once all data was gathered and the main areas of interest were identified, a gap analysis was made. Empirical findings were compared to secondary data about how the company describes itself, by gathering main findings from interviews and workshops and comparing the findings to the Volvo Way (2009) and the organization's strategic objectives (Truck operations' focus areas and strategic objectives, 2012).

3.6. Validity, reliability and ethics

When performing a case study, there are certain aspects of validity that need to be handled. In particular the external validity, i.e. how generalizable the findings are among different social settings, can be suffering in a qualitative study like this one where focus is within a certain context (Bryman and Bell, 2011). By having as a part of the research to try to understand the corporate culture at AMT, as well as going in-depth with a few employees to really get a hold of the real underlying factors affecting learning at the department, findings useful also in other parts of the company could hopefully be made.

To strengthen the construct validity of the research, triangulation through use of different data collection was conducted. In this case observations, interviews and the combinations of both through the workshop activities were combined to give more credibility to the data collected. The workshops also worked as opportunities to present findings and have them reviewed by the interviewees, what Bryman and Bell (2011) call respondent validation. All three departments in the second interview step had

representatives on both workshops and all participants were in line with the findings. During the discussion after the final presentation at the company, the interviewees clearly took stand and defended the conclusions made from the interview data, which can be considered a good verification of their validity.

When doing a research that includes both peoples' honest opinions and corporate strategies it is important to be open about what is going to end up in a report and what's not. In order to minimize the risk of harming participants, data presented has been anonymized. All data obtained during company visits were read over by company representatives and agreed upon before put into this report, without us having to remove anything that would contribute to the analysis.

When who to interview for the second interview step was decided, our supervisors first checked with the proposed interviewees' managers for approval of including them in the research. The interviews then took place when the persons could meet and had time to do so and they were continuously informed of what topics we aimed to cover.

4. Empirical Findings

In this section, empirical findings from the research are presented. First the artifacts or the case findings from interviews, workshop and observations are presented. Next, the espoused values are presented and finally findings and reflections from previous research theses made for the organization.

4.1. Artifacts

Findings from interviews, workshop and observation give a good picture of how learning within the organization occurs today and how it has developed through the years. Below, findings are presented as summaries of the data collection as well as appropriate, descriptive quotes from the interviews.

The research focused mainly on four main areas found affecting learning at the organization. They are Knowledge Networks, Reflection, Feedback and Measurements. These areas were given much attention during the interviews in both of the interview phases of the research. The impact these areas have on employees' learning at AMT was finally confirmed at the workshop, held in the end of the process.

4.1.1. Knowledge Networks

Employees are well aware of the importance of developing and maintaining a good knowledge network. This takes time and according to interviewees it takes around one year to build up a good network of people around you. The building and maintaining of knowledge networks is something you are expected to take care of yourself by interacting with others and getting to know the people you deliver.

> "*Building up a network is a continuous struggle. People are switching jobs and there are reorganizations [..]. It takes a lot of time.*"

> *"People are in general helpful toward each other if they have time, but earlier it was easier to do things 'on the side'. Today you're only supposed to work on projects with funding."*

Informal Interaction

This investigation has shown that there is a good working atmosphere that allows flexible communication and employees are in general not afraid of asking others and willing to help others. Though, the organization has now changed toward people working more in projects and then have to register their spent hours in certain projects. That is said to decrease flexibility in terms of assisting others and making administration more complicated.

Informal interaction in terms of social gathering, coffee breaks and outside work events are described as less now than before the reorganization and they were a company of their own, Volvo Parts. Then departments had their own budget and could arrange

events, also outside of work where they could meet people they would otherwise never meet except maybe in meetings. Some managers in certain departments try to incorporate it internally, through minor activities such as Friday-coffee but it is dependent on each manager's or employee's initiative.

For new employees there is a so called Induction Program. It is aimed toward the company, of how to treat new employees and what knowledge areas they need to be introduced to. There are education programs for different IT-tools for instance, although learning-by-doing is the most common way of learning.

Formal Interaction

Meetings are the natural way of formal interaction. Then, people working in the same projects get the opportunity to understand others tasks, ask questions and contribute to their own and others' work. In cross-functional teams those meetings are sometimes the only interaction due to difference in locations that sometimes can be all over the globe or just different locations around Gothenburg.

Though, having people close to each other is no guarantee for increased informal interaction and one example is that employees tend to have online meetings despite being situated in the same building.

Finding Others

Complications, including time difference, culture, sometimes unclear responsibilities and the fact that learnings from projects are rarely transferred between regions makes interaction and finding the right people more difficult. Unclear responsibilities between regions and sites are said to affect the possibility of interaction and overall unclear responsibilities were also described as a problem. The tools available for finding people are not considered user friendly and majority of the interviewees do not use them at all. However, employees claim that there is an awareness of the importance of cross-functional interaction and that AMT works more cross-functionally today than during the Volvo Parts era, which has made problem solving easier in many ways.

> *"It's easy to find which people are in which department, but not what department and who is responsible for what. If you need to contact someone with a certain responsibility, you use your network to find him and ask around."*

Team Diversity

When project teams are assigned, it's common that not all necessary competence is available in the group and people have to be brought into the team later or involved from outside of the project. An example was from a project where an older designer with great experience participated in the initial phase together with the younger people.

> *"Bringing in missed competence late in a project is bad because the people coming in are less involved."*

4.1.2. Reflection

White Books

White Book making serves as a formal reflection for teams after projects are finished. After each project group finishes its part of a project a white book is made which is a post-project review. Everybody should participate in making it and it should be used as an input before next projects are initiated. These white books could be a good source for learning for other projects but tend not to be used after they are made. Employees were asked why not and the answers differed. One is that people can't find them because they are stored somewhere in a database where they are hard to retrieve. Another is that there is no one making sure previous experiences are went through in the beginning of projects. It is recommended to do it, but it's not being monitored. Due to this, people experience repetition of old mistakes and what should actually be a root cause analysis (RCA) instead becomes "firefighting" because of time pressure. Though, the support functions have started to log repeated deviations from customers in order to initiate RCA's.

Career Paths

> *"There is a limited possibility in raising your salaries in your department if you are not interested in becoming a manager. They lose competence with this and have to train a new person for the role."*

The organization supports a career path in terms of directing people up the organization's ladders. However 3 out of 5 interviewees working in projects mean that there is a lack of career paths within their roles if they are not interested in becoming managers. A competence loss in a department when knowledgeable people leave their roles means that new project groups can lack experience from older projects. As white books are usually not utilized before new projects start, same mistakes that could be prevented easily might repeat themselves.

Personal reflection

How much you reflect on a personal level depends on who you are as a person. All employees have to make Personal Business Plans where they define how they want to develop and how they think it would contribute to the company. This is evaluated together with the manager and updated once a year.

4.1.3. Feedback

All interviewees in the second interview step mention an inconsistency in the organization regarding who the customer is considered to be, which leads to difficulties creating and maintaining an efficient customer feedback process. The interview results verified that the employees, except for those working in direct support functions, want more effective and efficient customer feedback.

"You get feedback when things go wrong, although it always comes through some other function first. If you don't get any you assume you've done things right, but you don't see if what you've done is used at all."

"Sometimes when I get feedback it's too late to do anything about it but if I had got it earlier I would have been able to fix things very easily"

"We are being told by the company that we should consider the immediate receiver of our deliveries our customer, but personally I consider the end user as my customer."

Feedback tends to come as a passive feedback, which is in the form of complaints if something does not turn out like planned. Three out of four interviewees working in projects mentioned that feedback tends to come too late in the process. The aftermarket requirements are supposed to be incorporated early in projects but the customer feedback processes are not in line with that. The employees interviewed both used to be closer to the end user and had more opportunities to meet them and talk face to face. Then, due to increased time pressure and focus on delivering more, they mean that feedback is suffering. Users were also visiting them to get an understanding of how they work. It's possible to access old customer data through so called Argus cases, which are how failures encountered by customers are reported, but the data can be difficult to find and does not always give information qualitative enough.

Finally, manager feedback and reflection upon employees' role and performance appears to have gained increased attention at AMT. Departments that do not already have regular feedback meetings are said to be developing such processes.

4.1.4. Measurements

From the organization's side there is a strong focus on KPI's but according to interviewees these do not tell the individual employees anything about how they can improve or about the quality they deliver, even though the number of metrics used has increased during the last years. This also creates bad statistics for managers and employees focus on giving them the numbers they want.

"We are only evaluated in terms of outcome and time which doesn't say anything about the quality of our deliveries."

A shift in focus in the organization, more aiming toward delivery, were brought up by 5 out of 7 interviewees during the second interview round.

When quantity and deliveries are not according to original plans, employees are called into meetings for a status update where they get feedback. This is usually in the end of projects when deadlines are approaching and time pressure is already high.

"I don't even know why I am filling this in"

Employees have to register their work hours spent on projects but 2 out of 5 of the interviewees working in projects expressed their frustration about the wide variety of different tools and reporting systems. The frequent updates or renewal of tools but lack of training and focus on "learning by doing" makes it time consuming to use them and also they do not always see the point of it as they do not know for what they are used for.

4.2. Espoused values

4.2.1. The Volvo Way

As a guide to what Volvo Group stands for and aspires to be, employees at Volvo are supposed to work according to the The Volvo Way (2009). The guide expresses the culture, behaviors and values to be shared within the whole Volvo Group. Built upon the Volvo Way is the Volvo Production System (VPS), which provides a management model which presents methods and tools with the aim of working with continuous improvement and create a culture in line with the Volvo Way. Volvo GTT also has strategic objectives aiming toward the whole organization to achieve.

In this section, quotes taken directly from The Volvo Way (2009) are presented. The quotes presented are only quotes concerning learning and the purpose is to show how the company manifests how it values and focuses on certain areas, which are then compared to interview findings in the Gap Analysis in Chapter 6. This is how The Volvo Way begins:

> *"The Volvo Way shows what we stand for and aspire to be in the future. It lays the foundation for developing the Volvo Group into the world's leading provider of commercial transport solutions. It is a recipe for success in which we strongly believe. It expresses the culture, behaviors and values shared across the Volvo Group.*
>
> *The Volvo Way is based on the conviction that every individual has the capability and the determination to improve our business operations and the desire to develop professionally.*
>
> *The Volvo Way is the lively dialogue between leaders, within teams and among colleagues around the world. This is the way we conduct business and deliver results. This is how we partner with customers and suppliers, how we work and change and how we build the future together.*
>
> *If you are new to this company, The Volvo Way provides a good introduction. If you have been with us for some time, you know how to use The Volvo Way as a guide for your behavior as individual, team member and leader."*

The Volvo Way is presented as representative for the culture and the shared values of the company and already in the beginning the company claims to being close to customers to understand their needs as well as having an open dialogue throughout the company on a global level.

"Our culture is how we work together with energy, passion and respect for the individual. It is about involvement, open dialogue and feedback. It is about diversity, teamwork and leadership. It is how we build trust, focus on customers and drive change."

"Active listening and a lively exchange of experiences, ideas and perspectives promote understanding and collaboration between different teams and functions. Messages are clear, timely and relevant."

"Face-to-face and team meetings are used to encourage an open dialogue."

"We are involved in setting the business direction and implementing the strategy. We actively participate in an open dialogue about plans, decisions and changes that affect our work, team assignment or business goals."

"Working across the different businesses in common projects, programs and processes creates opportunities for sharing knowledge and learning from best practices."

The importance of collaborating with others within the organization, both with the ones closest to you and also cross-functionally and the open dialogue and overall openness of the company is lifted forward. Sharing knowledge and learn from best practices through interaction is also underlined.

"We recognize each individual's contribution, and celebrate the achievements of our colleagues."

"Early involvement of customers ensures a deeper understanding of their business needs. The openness to change and constructive dialogue across the businesses are other enabling factors."

"We leverage effective teamwork and create cross-functional teams to identify and resolve problems. Customers, suppliers and other partners are invited to participate. Comprehensive internal and external feedback fuels these joint efforts."

"We collaborate closely with customers to develop products and services that improve their productivity, flexibility, cost-efficiency and profitability. We try to understand their unique requirements and to find the most appropriate solution that matches their expectations and current business needs. We are enhancing dealer and service networks, and we strive to differentiate our aftermarket products and service offerings. We all interface and interact with different customers."

"Leaders regularly provide feedback that is specific, timely and actionable. This clarifies expectations and reinforces behavior leading to improvements. Leaders also set an example by frequently asking for feedback from customers, colleagues and employees."

"Leaders communicate frequently and proactively with all employees, especially during times of change and challenging business conditions."

> *"We can all contribute to the improvement efforts of our colleagues. By giving positive feedback and encouraging each other, we strengthen the willingness to act and learn."*

Feedback is given much attention in The Volvo Way, both feedback from managers, between employees and from customers. The importance of having a close customer relation is once again brought forward, as well as the cross-functional teamwork.

> *"We quantify and measure to deliver excellence, quality, and results."*

> *"We use quantifiable data to monitor and understand reality."*

Measurements, which is another kind of feedback and how they are used in the whole is also presented as a part of the culture and values of the company.

> *"All employees are focused on continuous improvements, which require a systematic and persistent approach."*

> *"Through open dialogue, all of us can contribute to improvements."*

> *"There is great strength in diversity. It contributes to increasing our productivity, collaboration and ability to innovate."*

> *"Throughout the entire organization, we aim to do things right the first time. We refuse to accept poor quality. By detecting and correcting problems at the real source, we are moving toward zero defects."*

> *"In a highly competitive market it matters to be fast, quick and nimble. We are convinced that higher speed in development projects and process execution will improve our bottom line."*

> *"We turn change into new opportunities for improving performance and growing the business. We respond with agility and flexibility to new commercial, regulatory and technological challenges."*

Continuous improvement as well as the importance of being dynamic and innovative is brought up here. Also the aim of identifying and eliminating problems at the real source is an interesting statement, where learning through reflection is an easy parallel to make. The company also claims to utilize the diversity related to different cultures and competences and through collaboration leverage these to create a successful result.

4.2.2. Volvo Production System

Volvo Production System (VPS) can in a simplified way be described as Volvo Group's equivalent to lean production. The Volvo Way make up the fundament of VPS and the values presented there are supposed to be realized through VPS (VPS - Vårt sätt att arbeta, 2008).

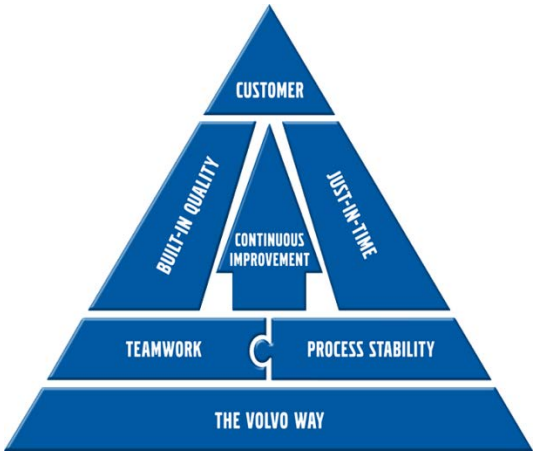

Figure 5. Volvo Production System

VPS is illustrated like figure 5 and is described (VPS-PDP Principles and Modules Posters, 2013).: "Volvo Production System is a customer-driven, people-oriented and unifying approach of common principles and practices to create customer value, eliminate waste and reach world class performance."

Among the interesting findings from studying VPS is a description of The Volvo Way, that it should make people "Take fact based decisions through a learning environment and challenge and continuously improve the way of working" and "Establish a culture of continuous learning and improvement" (VPS-PDP Principles and Modules Posters, 2013).

Studying the illustration of VPS, it is clear that there is a strong focus on the customer. The underlying parts show what is required in order to deliver according to the customer wants and needs and teamwork, process stability and continuous improvement are all areas related to learning.

Teamwork is presented as where people's experience, knowledge and creativity is put into play and interesting key elements are (VPS-PDP Principles and Modules Posters, 2013).:

> *Set an organization where knowledge is easily created, captured, transferred and recovered*
>
> *An agile organization, with ability to handle sustainable development and deviations*
>
> *Develop and secure competence and make full use of the collective knowledge within and outside the company for competitive advantage*
>
> *Enhance cooperation between stakeholders for learning, knowledge sharing and decision-making.*

Learning through cooperation, an ability to adapt to changes and the overall importance of building competence and knowledge together with others are all lifted as key elements of successful teamwork.

To achieve process stability, having a standard way of working is presented as "the way to ensure that processes and a set of best practices are defined, adhered to and continuously improved to reduce waste in the way of working". Continuous improvement is the very center of the VPS model and is supposed to influence the mindset during all activities taking place. During a presentation of VPS (VPS-PDP Principles and Modules Posters, 2013), continuous improvement was described as "the pounding heart of VPS", where all kinds of improvements from small daily ones to improvements through cross-functional teams all lead toward an improved customer experience.

4.2.3. Strategic objectives

Two of the focus areas in the Strategic objectives of Volvo Group (Truck operations' focus areas and strategic objectives, 2012) have caught our attention, since they are related to learning activities.

Focus area 2:
Strengthen customer business partnership

> *Success is based on being the best at solving our customers' problems and strengthening their operational performance. This is a key factor in building customer loyalty and becoming our customers' preferred business partner.*

The strategic objectives also highlight the importance of a close relation to the customers in order to obtain feedback and be able to deliver what they want is lifted forward.

Focus area 5:
Build high performing global teams

> *To outperform competitors and achieve agreed objectives, we must attract and retain people with the right competencies across all of our businesses. Fully leveraging the existing in-depth business expertise and adopting best practices throughout our global organization will set us apart from the competition.*

Making use of knowledge and competence created in projects and everyday work throughout the whole company and thus gain competitive advantages toward competitors is considered one of the main focus areas for the whole Volvo Group, which proves that the company is aware of the value of knowledge as an asset.

5. Inspirational outlook

To bring some more strength to the recommendations, as well as getting a picture of best/different practices to have something to compare to Volvo GTT that it might also learn from, an inspirational outlook into other companies was made. The companies selected were both within a similar industry, but also in totally different ones to get a wider view of what sources of inspiration there might be.

5.1. RUAG Space

When looking for companies to look at for inspiration how to facilitate a learning environment, our supervisor at Chalmers suggested RUAG Space where the University were part of a project about how to retain knowledge in project teams some 15-20 years ago and thought it would be interesting to see how they were working now. A two-hour meeting with a Materials- and Processes Engineer and the Quality Manager together was held, where they presented how they work and we finished off by asking a few interview questions on things we wanted to know more about. These are our findings.

RUAG Space is a company previously known as SAAB Space, which was acquired by a holding company owned by the Swiss government in 2008. RUAG Space's core business is to develop and manufacture high-tech equipment for satellites and space shuttles and they employ over 1100 people in a total of 7 sites in Switzerland, Austria and Sweden. The site in Gothenburg hosts approximately 300 employees. All employees in Gothenburg are located in the same building and there is a common food court in the building so employees remain there during lunch. The quality requirements in the business are incredibly high because doing service on a unit that has left the earth is not really an option. As of today, they claim to have a record of zero failures among the advanced products being sent to space.

In 2006, before they became RUAG Space, the company started to implement Lean production methods and processes. Doing so, they visited and applied best practices from other companies considered successful with lean implementation, like Scania and Ericsson. Today they use several Lean tools like Pulse meetings, A3's, improvement boards and Blue Notes. In general, they try to think outside of the box when looking for inspiration and focus on the relevant process rather than the business as such. For instance, the purchasing department went looking at how Ullared, a warehouse selling a huge variations of (often low-quality) products at a cheap price work to get good deals with suppliers since they have to be good at it to still make any profit out of the low income per unit sold. They have a continuous contact with other companies, both suppliers and customers and have an evaluation system used both ways where different aspects of the interaction between the companies are graded and suggestions of how improvement could be achieved are presented. Regular visits to and from main suppliers and customers are also taking place, and other companies come to RUAG to use their advanced testing facilities and analysis laboratory.

RUAG have an IT-system where more or less all project documentation, with the exception for where legal issues may interfere, are available to all employees and the project pages are built up the same way in all projects. Within projects, a common spreadsheet is filled out continuously when problems show up and learnings are made. Earlier this was being done in the end of projects, but it was noticed that people tend to forget what they did some time ago and projects can go on over several years. There is also an internal wiki called Besserwisser where explicit knowledge can be entered, but the system is only used by a minority of the employees. Due to the high quality requirements, a root cause analysis always have to be made when problems are encountered. The issue and the solution is then dealt with on a meeting with the involved people. Once a week, a meeting where all divisions are represented is taking place where nonconformance that has showed up since last week is reviewed. The purpose is to identify who is responsible, to learn how they are to be taken care of and how they relate to processes.

The company has what they call “common procedures” (Quality standards) for all projects that people work in and if an issue leads to a corrective action the procedure is updated. Thus, the next time the procedure is initiated it will be according to the updated instruction. Both the one who made the update and also the latest user are marked in the system, in case contact is necessary. All people who may have anything to do with the project are connected to it from the beginning and when something is updated, an e-mail is sent out and they are thereby informed of the changes made.

When teams are formed for projects, they do not count on that all competence necessary should be available within each group. Instead, they expect teams to cooperate and share knowledge to help each other when needed. In the IT-system they have a clear list of all employees and their responsibilities to facilitate the finding of people and names are clickable to access contact information as well as a picture of the employee.

All processes also have a process review each quarter, where emphasis is on having the right people participating and making people learn and develop the process together. KPI’s are also presented during this meeting. RUAG Space, like Volvo, use KPI’s as a quantitative measurement of how different business areas are performing. They also break down the KPI’s in regards to the deliveries of different functions to make the data more actionable for the individual employee.

The visit at RUAG Space showed that even a company with excellent prerequisites for networking as well as both formal and informal interaction, not too many employees and all working under the same roof, can feel a need to facilitate finding people even further. They do it through clear role descriptions available in the intranet combined with an open and expressed knowledge sharing between projects. Another interesting finding is their continuous elimination of problems and the immediate update of work instructions. RUAG Space also value a close relationship with their customers high in order to produce the extreme quality products they demand.

5.2. Volvo Cars

To get an insight into how other companies preserve and make learnings become a part of a standardized way of working, Volvo Cars was visited. An hour-long meeting was held with the Corporate Quality Manager with company-wide responsibility, who is also the process owner of Lessons Learned. The aim of the meeting was to get to know how they work with their Lessons Learned program as well as getting an insight into other processes in regards to how they encourage learning within the organization.

The Lessons Learned Program was initiated formally in 2007 when the company recognized an increasing need to structure and utilize learnings in new projects to avoid costly product deviations affecting the whole organization and in the worst case leading to cars being withdrawn from the market. The initial program was all product focused and consisted of a database and a process to find root causes. Once a root cause is identified, they continue to investigate it until the very underlying reason for the issue is identified, which for instance can boil down to a methodology level with a miscommunication during a single decision-making inside a project group.

Today the company uses the program in many other functions than just the ones directly related to the product development, such as purchasing, HR, IT, etc. It is no longer only about avoiding repeated failures, but also about sharing best practices for all kinds of work situations and secure a continuous learning. Findings are stored in a database accessible for everyone within the organization where Prevent Recurrence Actions (PRA's) and work descriptions are being updated. This standardization of the findings is important and the final part of the process, which then is reviewed and closed.

A decision to perform a Lessons Learned can be taken on any level of the company, but it always starts in a local forum. In the end it can reach corporate level and involve different functions within the company, although most are handled locally. Statistics are kept for the programs and around 5-10 new Lessons Learned reach corporate level every second week. To do so they have to either be considered a critical concern (eg. have legal implications, safety implications or pose a threat of main disturbance for the customer) or it has forced the company to take measures after a product is put on the market.

As an early step in new projects, project teams are required to look into the Lessons Learned database and incorporate suggested changes from previous programs. This is a milestone, which is a pre-decided point (gate) where certain requirements have to be fulfilled before the process can continue, and they are supposed to report it. The audience, who reviews the process and makes sure it's done, depends on the size of the project but it can for instance be a project manager. There is also a documentation of the project process being made, similar to the white books at Volvo Trucks, but here it's being filled out at each milestone throughout the project and not all in the end.

In the database there is also a section for Design Guidelines where large amount of knowledge can be collected. It has been an ongoing project the past 18 months to make this knowledge formalized and accessible, also the knowledge from people with experience and role-specific knowledge. All product sub-systems areas (like function groups at Volvo Trucks) have their Design Guidelines and they are now a natural part of the PRA's. Through the Design Guidelines it is also possible to find knowledgeable people to contact if necessary.

Individual employees are affected by the Lessons Learned Program mainly either through participation, access to the knowledge in the databases, or that a problem they might encounter in the future is taken care of in an advance. The company of course wants people to share knowledge and use and contribute to the databases. It's incorporated in some ways and pushed by managers to happen regularly, although not formally. People are trained to drive the organization toward an increased knowledge together and try to build a methodology around it by using mainly six-sigma frameworks. The purpose with the databases is to be used as a support tool for employees in order to give people a little more space to reflect. There are different kinds of data for different kinds of processes and assistance may also be needed for people to find the relevant one. But the everyday activities taking place are still considered key in order to create a learning organization.

Volvo Cars' way of working with lessons learned and standardization of improved processes is an interesting way of working towards continuous improvement, which is both in line with learning theory (Schein, 2009) and taking place in a business similar to the one AMT are active in. The culture in the two companies can also be assumed to be quite similar. They were after all one company originally and it's not uncommon that employees move between the two. This makes Volvo Cars an interesting company for benchmarking, especially since they have a formal way of addressing reuse of knowledge that differs from the white books used at Volvo Group. These are the main takeaways from the company visit.

5.3. Consulting company

The third company used as a point of reference is a large international IT- and management consultant company. Since knowledge is what they have to offer to their customers, consultant firms are assumed to be using well developed ways of dealing with learning and knowledge sharing. A 45 minutes long phone interview was held with an IT-consultant with a couple of years of experience at the company. It was decided to keep the interviewee and the company anonymous in order to avoid going through a long review process with the company to get official approval for the result of the interview.

During the first two years at the company, the interviewee was part of a continuous learning program containing several courses, generally relating to the IT-system he works with as well as courses to get an overall understanding of the role and the

company. The program was taking place in parallel with ordinary work and also contained an international training session about general problem solving and working methods within the global company as well as mandatory online training. During training, people were added to e-mail lists where recommended courses according to role and deliveries were promoted. The goal of the training was that together with working make people more specialized within their area, though it looks different in entities of the company where other specialization is needed.

Training is considered a natural part of the job, also after the introduction. Each employee has an annual budget to spend on courses and there are new training options for each career step. Training takes place during regular working hours but some training, like studies for a certification tests, might have to be done outside of work. Though, the company always pays for the education.

Each employee has a mentor that they meet at minimum once every six months. The mentor is someone on a higher level in the company hierarchy and talking to a mentor provides the employee with a different insight into how to thrive in the company as well as an opportunity to reflect upon the role and share concerns and thoughts. Annual goals are set together with the mentor, regarding how you want to develop as an employee during the years to come, what courses you would like to attend and what areas you want to focus on in the building of your career, etc. They evaluate their position and work and get advices from a more experienced employee. All mentors are visible at the intranet, all the way up to CEO-level. Beside the mentorship, employees are evaluated individually and receive managers´ feedback in connection to projects and how targets are reached, and projects have different performance metrics too. Feedback from customers varies depending on who they are and what kind of project they are running with them. Personal chemistry between consultant and client together with company culture have the strongest impact on the customer relation according to the employee and there is formal customer feedback where customers rank satisfaction after projects.

During projects, continuous lessons learned-activities are taking place. Especially when there is uncertainty related to the next step of a project and what has been done so far really has to be clear in order to continue. Successful projects are used as reference for new projects and when setting up the scene in a new project they see what old projects they have within a similar setting. Projects are categorized to be found in the future, e.g. to be able to show a customer facts like “we have made XX successful projects before within a similar context as this and it generated savings of around YY MSEK”.

Some projects are more standardized than others, and then there are best practices and step-by-step working guides stored as support. In less standardized projects, people use either their own experience or contact someone who has relevant knowledge. Like the interviewee put it: “If you’re going to do something you haven’t done before, ask someone who has done it before.”. When project teams are formed the company tries to form teams where someone with similar experience is participating. For instance, in the project the interviewee is working right now an employee was brought in from another

country because he had been doing several similar projects before. Though, in big projects it's of course likely that a need for some specialist that wasn't accounted on initially will show up later on.

Since the company is a global actor, it can be difficult to get to know all colleagues and clients if they are situated abroad. They try to solve this by letting employees travel and meet people they work with just to get a face on them. For instance, the interviewee is now going to India only for a couple of days since they have programmers working for them there. The extent to which this is done depends on the size of the project but they try to do it in all larger projects.

When asked how knowledge is shared among employees, the intranet was mentioned as the main storage of explicit knowledge. There people can share knowledge in communities and forums and also be part of e-mail lists with internal experts within different areas. Questions can be sent directly to people and there are several experts within each area. Though, when sharing knowledge through the intranet you have to be careful not to disclose sensitive information about clients, e.g. by categorizing the knowledge after country and business area rather than company name. If you know what you're looking for you can find it on the intranet, but it contains a lot of information and it's easy to get lost so the extent to which it is used is uncertain. Beside the intranet and the mentor, you also have your own network of people you ask when you have questions, both within projects and overall. If they don't know the answer they can always send you on to someone else who might know. Due to the high number of specialists, finding answers usually is quite easy.

The consulting company appears to work quite differently compared to AMT, but to get influences from a company dealing with knowledge is important when investigating learning. The main influences are possibly the way of transferring knowledge into new projects through experienced people and the constant reflecting and follow-up on your own role and deliveries as an employee. They also value knowing the people you work together with high, and to create a mutual understanding of what you do in the project. The environment in the consulting company appears to be open regarding asking coworkers for help, and that is a similarity to how interviewed employees perceive the environment at AMT.

6. Gap Analysis

In this section, empirical findings and the gaps between artifacts and espoused values are analyzed and discussed using the theoretical framework created and interesting findings from the other companies visited as comparison. The focus is on the four main areas identified affecting learning in AMT.

Knowledge networks, reflection, feedback and measurements are the four focus areas for the gap analysis. The thesis research was aimed to looking into the tacit knowledge aspect of learning and these four areas were found to be important to look further into in relation to that.

6.1. Knowledge networks

In The Volvo Way (2009) the importance of interaction among employees both regarding the tacit and explicit aspects of knowledge is underlined. The importance of keeping an open dialogue with continuous collaboration, effective team-work and cross-functional interaction is highlighted. There is also focus on making everybody involved and an active participation for everybody in setting the business direction and strategic decision making.

This research has found that informal interaction among employees is highly dependent on the individuals themselves and that the social-gathering perspective of interaction is today down-prioritized and dependent on the individual employees' or managers' initiatives.

As described in theory, interaction with other people and especially people with relevant competence is of great advantage when going through a learning process as well as facilitating for the organization to make better use of knowledge residing in individuals (Argote 2013; Nonaka 1994; Nonaka et al. 2000). A strong knowledge network is an important support to initiate an interaction as well as making problem solving easier and thereby facilitates learning and innovativeness (Chassagnon and Audran, 2011), and today this is taken care of by employees themselves.

The research findings reveal an obvious gap between the perception of Volvo about the importance of collaboration and knowledge sharing between employees and how the company supports and fosters the building of networks among employees. People manage to create and maintain knowledge networks on their own, but the process is not facilitated by the company in a way that makes the networks useful to their full potential although they are described as crucial when initiating interaction.

6.2. Reflection

Among the espoused values presented by the organization there is a strong focus on continuous improvement, early detection and correction of problems and the adoption of best practices which requires investing time in reflection upon projects and processes.

Also the strength related to being able to solve challenging problems together through utilizing different backgrounds and competences is highlighted and this is all in line with what theory refers to as reflection activities facilitating learning (Scheinberg 2013; Zollo and Winter 2002; Høyrup 2004; Anseel et al. 2009). Reflecting together with others is a way to also enable the sharing of tacit knowledge which would otherwise be impossible through a tool such as an IT system (Schein, 2009).

In practice, the White Book production is described as the only formal occasion for a group reflection on what learnings have been made in a project. However, the reflection mainly concerns the project and what's being produced during reflection is rarely ever used again in new projects which makes the reflection beneficial only for the participants. This is also supported by the findings in the previous theses by Berntsson and Regnander-Bergh (2012) as well as Ghaedian and Chen (2012). The continuous improvement through the use of best practices mentioned in the description of VPS would require a secured learning from previous mistakes, where reflections and learnings made from previous projects is brought into new ones. When the documentation of those mistakes is not re-used this is not being done unless someone who's been part of an old project happens to end up in a new similar project and can thus bring previous learnings into it through themselves. According to theory, being able to utilize previous learnings is also a key requirement to be able to adjust to a changing environment and stay innovative (Argyris 2002; Schein 2009; Teece et al. 1997).

One question you could ask is if the White Book production is a waste since the only contribution it seems to make in terms of learning is that the people making the White Books reflect meanwhile. This might be possible to accomplish in a more time-efficient way. Ghaedian and Chen (2012) also raise the concern about the use of White Books and several attempts to utilize them in a more successful way have been made in the Volvo Organization but apparently without much success.

According to the employees interviewed, finding the root cause of problems and eliminate them is mainly hindered by time pressure. Doing RCA requires resources and involves going through a learning process. Double-loop learning requires a deep level of reflection (Argyris, 1976), and to be able to change a behavior it is necessary to leave the old way of working behind which can be a tough process (Schein, 2009). However, the focus on RCA has increased within the support functions as there is an awareness of the contribution of RCAs to continuous improvement.

The structure described regarding career paths is not in line with how the strategic objectives (Truck operations' focus areas and strategic objectives, 2012) and VPS (VPS-PDP Principles and Modules Posters, 2013) state how the company should work to retain and secure competence to make full use of the collective knowledge. When an experienced employee with a certain competence and knowledge leaves a department it is less likely that previous learnings will be brought into another project through people.

The personal business plans are one way for employees to have a returning reflection on roles and their own performance, and through the espoused values the company manifests an awareness of the importance of reflection between people. Though, the formal ways of reflecting in the organization is perceived as something that could be utilized in a better way to support learning.

6.3. Feedback

As seen both in the Volvo Way (2009) and the strategic objectives of the organization (Truck operations' focus areas and strategic objectives, 2012), feedback is prioritized from the management's and customers' perspectives. The same can be asserted about the employees. They are aware of that feedback is crucial both from managers, coworkers and the customers, who they refer to as the end users of their deliveries, in order to improve their performances and understand the customers' wants.

On one hand, the research shows that formal management feedback processes in terms of personal business plans, follow-ups and performance reviews are in line with how they are claimed to be. In places where those processes have been found lacking there are plans for improvements. On the other hand, the customer feedback processes and how customer feedback affects deliveries are not in line with how the company aspires to be.

Feeling too far away from the customers, the employees are not getting appropriate active feedback. The feedback people get from customers is described as more or less exclusively in the form of passive feedback, which is when something has gone wrong or is not according to plans (Wirtz and Lee 2003; Mattila and Wirtz, 2004). With too little feedback a need to learn, or what Schein (2009) describes as survival anxiety, is never triggered and employees assume there is no need to change or develop anything unless hearing otherwise. In the AMT environment it is also crucial to get the feedback early to be able to have an impact on for example the development of a new truck. An ineffective customer feedback process where the data arrives late can impact the innovativeness of the whole organization.

Another issue raised is that people experience difficulties in obtaining the customer feedback and data, even if it is available somewhere in the company**,** which can be described as an overall difficulty for information from outside the company to reach people inside the organization. Theory highlights the importance of receiving a sufficient amount of feedback (Lam et al. 2011), not too much and not too little. How much feedback you get is today described as highly dependent on the individual employees and managers. At AMT, the general opinion is that feedback is sufficient from managers and coworkers, but lacking when it comes to the customers. The uncertainty about who to consider being the source of customer feedback further highlights the existing gaps between the desired level of customer input and the actual impact customer feedback has.

6.4. Measurements

The use of quantifiable data to monitor and understand reality, as is said to be the case in The Volvo Way (2009), compared to how employees perceive how the measurements affect their daily work shows big gaps between the two. If the measurements really would increase the understanding of reality for employees, they would definitely contribute to the delivering of excellence, quality and results as stated in the espoused values of the company. But as described by interviewees, the measurements used rather have the opposite effect, turning focus on delivering quantity rather than quality.

From a learning perspective, this focus on time makes people action oriented which doesn't give them time or make them prioritize to reflect on what they do or an opportunity to learn from it. This can be closely related to the cycle of experience by Scheinberg (2013) and the definitions of single- and double-loop learning (Argyris, 1976), where the incentive structure created by the measurements used is said to lead to the former rather than the latter. When measurements are interpreted as mainly measuring quantity like outcome and time, there is no other way of improving the numbers than to increase the outcome, and there are no incentives to reflect or improve quality since it wouldn't contribute to it short-term. The trend at the company described by interviewees that the overall focus is shifting more toward deliveries, is possibly related to the measurements used although such a relationship would need further investigation.

When talking to knowledgeable people at Chalmers about their impressions from companies similar to Volvo, they mentioned an over-administration within the organizations obstructing learning situations from occurring. The situation described by employees with various metrics and reporting systems taking time and freedom from people to just "do their job" also supports this. At the same time the administration further increases the feeling of time pressure.

AMT seems to suffer due to how the organization mainly focuses on measuring deliveries in terms of output. This can also affect who employees communicate with. There is a risk that they lean more toward short time solutions to deliver fast and include people in their knowledge networks for that rather than people they learn from and make them improve in their role. The company is eager to measure progress and have a big setup of different measurements aimed at doing so. Though, the incentives they create foster a behavior that hinders learning and makes the progress intended to be measured suffer. This is a gap that has to be handled.

7. Discussion and Recommendations

In this section, the results of the gap analysis are discussed. Recommendations about possible next steps to take for AMT which in the long run can lead to improved learning in the department are presented.

The recommendations in this section are based on the gap analysis and issues identified are compared to ideas found in theory and interesting findings from the inspirational outlook. Overall, when comparing to other companies an advice is to take inspiration from organizations who are good at certain processes rather than limit benchmarking to companies in a similar industry. Having a culture not too unlike the benchmarking company is also an advantage since different ways of working are viable in different cultural environments. During the research, several qualities of the AMT organization were lifted forward. Based on observations and interviews, the working environment in the company appears to be attractive in terms of working spirit and willingness of employees to use their knowledge and competence to assist others, improve and learn. It is important to utilize these strengths when taking the next steps towards improving learning in the organization.

7.1. Knowledge networks

It is important for employees to have updated knowledge networks as found in the empirical research. The question is how creation and maintenance of knowledge networks can be facilitated to decrease the gaps identified regarding collaboration and knowledge sharing between employees. Support making it easier to find people with certain competences and responsibilities have been mentioned, but as seen through the years the challenge with such tools is to design them in a way that makes people use them.

An increased cross-functionality throughout AMT has also been described positive for problem solving capabilities, which is a sign that effort made from the companies' side to increase this has been fruitful.

Support the maintenance and creation of knowledge networks

The organization has a huge strength in that employees manage to create and maintain knowledge networks on their own which help them in their daily work and that is something to build on when investigating further solutions to improve learning and knowledge sharing.

One way of supporting the knowledge networks is to get an overview of how networks are built today by employees and use as inspiration together with input from people working with them on a daily basis.

Ensure accessibility and visualization

Another recommendation is to investigate how other companies facilitate knowledge networks by increasing accessibility between employees. RUAG Space with their clearly defined roles and responsibilities of each employee, easily accessible on the intranet with the focus on visualizing employees´ competences can for instance be used for benchmarking. .

Introduce new employees to existing knowledge networks

When an employee leaves a role and a new one takes over it is important to put an effort into having the predecessor leave information to the new employee about main contact persons or introduce the new employee to his/her knowledge network. It is recommended for the organization to come up with formal processes of handing over also information about important contacts to new employees. This to facilitate for the new employee to adjust quickly, get a hold of what other people are important to be able to deliver in the role and save time that would otherwise be spent looking for people.

7.2. Reflection

A gap between how the company claims to work with reflection and reuse of knowledge to achieve continuous improvement in the organization and how it is actually taking place has been identified. Difficulties to utilize knowledge from previous projects in new ones are lifted as a problem. The existing method, the White Books, is considered working badly by both interviewees and the previous theses studied.

The reuse of knowledge from previous projects needs to be secured. It increases quality of projects through an earlier detection of problems and facilitates for people to do the right thing from the beginning. The White Books are not considered working as intended even though attempts to improve the process have been made. The Lessons Learned Program at Volvo Cars is however said to be working well in terms of reuse of knowledge, and also RUAG Space have formalized processes for standardization of new and improved ways of working.

The formal way of the interviewed consulting firm to create project teams is another approach towards reuse of knowledge found interesting; reuse of knowledge through experienced people rather than updates of guidelines. They secure relevant competence in a team by utilizing people's experience and making sure that bigger projects contain at least one experienced individual who has participated in a similar project before. It also facilitates tacit knowledge sharing through problem solving together with experienced colleagues.

Secure standardization of improvements and reuse of knowledge

The organization is recommended to look into Volvo Cars and how they ensure that new projects do not start before teams have looked into so called Lessons Learned from previous projects.

Also the procedures in RUAG Space, i.e. the standardization of new and improved ways of working and solving problems through the so called corrective actions and deviations, are interesting to look further into. It is also recommended to, like the interviewed consultant company, take the aspect of experience into consideration when forming project teams.

Consider a mentoring program

It is recommended to consider a mentoring program that would make people meet someone on a higher level regularly and reflect upon their role and get advices and support from a more experienced employee. The Personal Business Plans are a step in that direction, but an even more continuous reflecting on the role and deliveries could be beneficial.

Make root cause analysis a continuous process

Root Cause Analysis is gaining more attention in the organization's support functions and if the findings are used to eliminate problems at their core it will contribute to the continuous improvement. Investigating how time can be dedicated also for RCAs to be done continuously when encountering problems is a recommendation in line with the aim to achieve a continuous improvement throughout the organization that is presented in VPS (VPS-PDP Principles and Modules Posters, 2013). This is also in line with how both Volvo Cars and RUAG Space work with preventing problems from reoccurring.

7.3. Feedback

Feedback comes from all directions and the feedback between managers and employees and also between colleagues works well and there are also efforts to improve it further taking place. To keep up and encourage this open environment is important and the possibilities to discuss different matters with people regardless of levels in the organization is a clear strength identified.

Volvo GTT is a large organization which makes it difficult for all employees to meet the customers of their own specific deliveries, especially the end users. There are processes for customer feedback in the organization although they are described as ineffective and distorting the customer data on the way to the final receiver. The fact that people with one voice claim to be too far away from the customers is proof enough of the fact that something needs to be done, and that there is an obvious gap when comparing to how the company presents the importance of customer feedback that needs to be addressed.

Ensure efficient utilization of customer feedback

It is recommended that AMT looks into best practices from other companies that work closely with their customers regarding customer contact and feedback processes RUAG Space works closely with their customers and arranges visits both at their place and at the main customers' sites. They also have evaluations made regularly by customers.

Since there is a gap in the opinion between the company and the employees about who the customer is and how far away they are it is important to work on clarifying from which customer the customer feedback should come, what kind of feedback is needed and when.

Map feedback processes

Mapping the information flow between customers and employees is recommended. It is important to have a clear picture of the feedback processes, and where and why it is distorted. Where to start that work needs to be prioritized as the processes differ highly between sites. Once a clear overview is achieved, a review of both the customer feedback processes and the possibilities of facilitating a more direct contact between AMT employees and the users of their deliveries can be performed.

7.4. Measurements

The quantitative measurement updates are one way of delivering feedback to employees where they have the opportunity to reflect upon their performances. However, there is a need for measurements that contribute to improve the quality of employees' deliveries. Further, employees mentioned the importance of receiving quantitative feedback earlier in processes, when there is less time pressure and people are more receptive toward feedback (Jackson et al., 2003). This underlines the need for process measurements and increased flexibility in measurements, both quantitative and qualitative.

Identify best practices

The company is making efforts in investigating how to measure quality. Looking into other companies that focus on quality in their measurements is recommended. RUAG Space is recommended to look into, due to strict testing methods for quality measurements and high quality standards. They claim to work with breaking down KPIs to make them actionable for individual employees which is something people at AMT are missing.

Increase employee involvement

Involving the people who are supposed to be measured when working on new measurements would also be a source of good input. Employees mention the extensive use of reporting functions they have to spend time on but can't see the real benefit of

and evaluate whether they are useful or if other companies might have better solutions for it is another suggestion.

7.5. Possible future research

Since the purpose of this thesis was rather to create an understanding of the situation at AMT today regarding learning than to deliver pure solutions for problems, it becomes natural to use the findings as guidance for further investigation. To summarize the recommendations, a list of possible new research questions the company could use when taking further steps within the area have been formulated. The research questions can be addressed through both smaller and bigger projects and contain influences on learning found in theory that were only touched upon briefly in the research. Although this research has focused mainly on investigating four areas that were found as important to act upon, a number of other factors that directly or indirectly impact learning have also caught our interest and therefore the recommendations are not limited to the four main focus areas.

Knowledge Networks

How can knowledge network creation and maintenance be supported by the organization?

Reflection

How would a mentoring program improve learning and reflection?

How could knowledge be reused to contribute to continuous improvement?

Feedback

Why is the customer feedback process not contributing to learning and how can it be improved?

Measurements

How should measurements be constructed to contribute to quality feedback?

Other

How can the organization make learning a natural part of the culture?

How does the physical environment hinder or facilitate learning?

8. Conclusions

This research has provided AMT with an overview of how learning occurs within the organization and which areas have most impact on learning. What distinguishes this research from previous research is that it has emphasized how learning occurs and what affects the learning, as well as a gap analysis which has confirmed deviations from the desired ways of working. This research has not focused on coming up with solutions but provides a base for next steps to take in terms of finding solutions.

From the beginning of this research it was clear that learning in organizations is an extremely broad concept and there are in fact no limits for how to investigate it. By identifying the four areas which impact learning the analyzing, understanding and further improvement work can be more straightforward to work with even though these areas all interrelate.

During this research we have learned and seen that learning in organizations is not only about the best tools and processes but more important the people involved and how the organizational culture must allow learning to occur. Visiting other organizations has given us the opportunity both to learn from them and compare AMT to organizations that are in the forefront in many processes regarding organizational learning. AMT can learn a lot from these companies but a lot of interesting work is also ongoing in AMT that others could learn from. Improving organizational learning requires major investment of time and resources but it is our opinion that with the resources, awareness and ambition within AMT they are well able to continue on the right track in improving and facilitating learning and tacit knowledge sharing.

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