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Project retrospectives and IT as supportive tools

Master thesis in the Master Programme International Project Management

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Master thesis ACEX30-19-84
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Cover: Learning from your experience the good bad and ugly (Abudi, 2016)

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Abstract

For organisations to be effective they must learn from their own projects to optimise their processes and prevent their employees from repeating mistakes (S. Duffield & Whitty, 2015). This master thesis investigates how the learning process at Wallenstam AB, a Swedish real estate organisation, could be enhanced by start using a new IT-system to enhance the access to information and project retrospectives as a way to structure their learning process.

Through an abductive process with systematic combining the learning process at Wallenstams' rebuilding group was investigated and a theoretical framework created. By reviewing today's process through the SYLLK-model it was detected that it made sense to focus on enhancing the technological element of the process, which also was a prerequisite from the organisation that had a new IT-system not yet used by the project department. Besides it was also detected that the group lacked a clear process of how to learn from projects, which were the reason to study if project retrospectives could support this. Data was gathered through literature studies, semi-structured interviews and participative observations where it should be added that the author was also hired by Wallenstam. Finally, the SECI-model, which explains knowledge creation were used as a way to evaluate whether the discussed measures actually could support the learning process and creation of knowledge.

It was found that by implementing the new IT-system there are good potential to enhance accessibility to information with search and sorting functions that could make the right information accessible to the right person at the right time and also to provide statistics of errors reported from projects. Project retrospectives were revealed to be efficient to create reflection about past performance, which is a key for future learning (Kerth, 2013) and hence identify and disseminate learning more efficient with support from the new IT-system. To finally apply findings from reviews and information from past projects in a social-based manner with guidance from colleagues or contractors could fulfil the learning spiral if viewed through a SECI-perspective explaining knowledge creation by interaction and conversions between tacit and explicit knowledge (Nonaka, Toyama, & Konno, 2000)

While all learning systems must be customised to suit their specific needs (Terzieva, 2014), this thesis have proven that it lies a potential that could support a learning process from projects in IT-systems to enhance accessibility of information and project retrospectives to identify and disseminate learning in an explicit process.

Keywords: Project knowledge management, Project retrospectives, Learning from experiences, SYLLK-model, SECI-model,

Abstrakt

För att organisationer ska kunna vara effektiva måste de kunna lära av sina projekt och erfarenheter för att optimera sina processer och förhindra att misstag återupprepas (S. Duffield & Whitty, 2015). Denna master uppsats undersöker hur lärande processen på Wallenstam AB, ett svenskt fastighetsbolag, kan förbättras genom att implementera ett av organisationen nyutvecklat IT-system för att enklare nå information samt hur projekt återblickar i form av möten samt ifyllnad av formulär kan användas för att strukturera lärande processen.

Genom en abduktiv process inkluderat systematiskt kombinerande har lärande processen i Wallenstams ombyggnadsgrupp undersökts och ett teoretiskt ramverk skapats. Genom att granska dagens process genom SYLLK-modellen kunde det fastställas att fokus bör vara på att utveckla användandet av det tekniska elementet i lärande processen, vilket också var en förutsättning från organisationen som har utvecklat ett nytt IT-system som ännu inte används av projekt avdelningen. Utöver detta upptäcktes att ombyggnadsgruppen saknar en tydlig process av hur man ska lära från projekt, vilket var anledningen till att studera hur projekt återblickar kan användas för att strukturera processen. Data har samlats genom litteraturstudier, semistrukturerade intervjuer och deltagande observationer, tilläggas bör också att författaren är anställd av Wallenstam. Slutligen användes SECI-modellen, som förklarar hur kunskap skapas för att utvärdera hur de diskuterade åtgärderna faktiskt kan stötta lärande processen och skapandet av kunskap.

Det konstaterades att genom implementering av det nya IT-systemet finns det god potential i att förbättra accessen till information genom sök- och sorteringsverktyg. Detta kan tillgängliggöra efterfrågad information till den som behöver det när den behövs och även förse sökaren av information med statistik av rapporterade fel från de olika projekten. Projekt återblickar har visats vara något som effektivt bidrar till att projektdeltagare reflekterar över tidigare utföranden, vilket är en nyckel för framtida lärande (Kerth, 2013) och därmed identifiera samt sprida lärdomar effektivt med stöd av det nya IT-systemet. Att till sist applicera dessa lärdomar från de dokumenterade återblickarna och information från tidigare projekt i praktiken tillsammans med rådgivning från kollegor och entreprenörer som har erfarenhet från dessa liknande redan utförda projekt bidrar till att sluta lärande spiralen sett ur SECI-modellens perspektiv. Vilken förklarar hur kunskap skapas genom interaktion och omvandlingar mellan explicit och implicit kunskap (Nonaka et al., 2000).

Medan alla lärande system behöver anpassas för att tillfredsställa de behov som en organisation har (Terzieva, 2014), har denna master uppsats påvisat att den finns potential i IT-system att förbättra access till information och i tillbaka återblickar för att strukturerat identifiera och sprida lärdomar från projekt och på så vis stärka en lärande process.

Nyckelord: Projekt kunskapshantering, Projekt tillbakablick, Erfarenhetsåterföring, SYLLK-model, SECI-model,

Preface

This master thesis have been conducted at the Master of Science Program International Project Management at Chalmers University of Technology in a tight cooperation with the real estate organisation Wallenstam AB.

I would like to thank my two supervisors from Chalmers University of Technology Rickard Andersson and Martine Buser for all guidance and feedback throughout the thesis. Second, I want to sincerely thank Wallenstam AB, my supervisor Magnus Bellvik and all the interviewees for your guidance, interest and support during my thesis writing at your organisation.

Finally, I want to extend a big thank you to Chalmers University of Technology for five years of education, a lot new friends and knowledge for life that I am looking forward to bring with me as I start my career at Wallenstam AB.

Gothenburg, June 2019
Johan Lord

Table of content

1. Introduction

Organisations need a well-established knowledge management system to avoid repeating mistakes over and over again and maximize efficiency. For this there is not a ready recipe to be applied but organisations must develop a process that is fitting to their needs (Terzieva, 2014) To review how this could be organised in a project based real estate organisation a case have been conducted to better understand what their process looks like today. Some general theories of learning and to make use of lessons from projects have been reviewed to gain a theoretical perspective and hence an analysis of where the possibilities are to strengthen the current learning process. This resulted in focus on how a new IT-system and implementation of documented project reviews could support the process of learning from projects at both an organisational and individual level. Furthermore, this introductive chapter consists of a background, problem formulation with included research questions and the limitations of the thesis.

In the competitive business market of today companies must carefully evaluate and develop their work processes to sustain a competitive position and maintain their efficiency. Included in this is the management of information and knowledge (North & Kumta, 2018). The relation between information and knowledge is ambiguous. One proposal is that it could be described that information is the result from when humans try to codify and transmit knowledge (Oppenheim, Stenson, & Wilson, 2003). Another perception is that information is data that are given a context and hence becomes useful and knowledge is information including human intuition and experience where one can possess more than one can describe. The intention with knowledge management, in particular lessons learned, is to derive knowledge from captured information and to make use of it as a competitive advantage for the organization. Comprehensive management of knowledge should take place on an individual, team and organizational level where knowledge is captured, disseminated and applied. This process will facilitate increased operational efficiency as well as the development and optimization of processes in order to achieve strategic and operational objectives of the organization (North & Kumta, 2018).

1.1. Background

This thesis will investigate the learning process at the project department of Wallenstam AB, which is a company both building and managing their own facilities. The study is based on a case study where it is the current process of capturing, disseminating and applying knowledge in the *rebuilding group* of the project department that will be reviewed in particular. The project department is divided in three groups where *project planning* and *project production* works with new production of houses while the *rebuilding group* execute projects in existing facilities. The focal point for this theses were developed through an abductive process, including both a literature review of the SYLLK- and SECI-model as well as reviewing the process of learning today at Wallenstam. It was determined that focus will be to investigate the use of IT and how project retrospectives potentially could support the learning process. These topics were chosen partly because one could notice the learning process to be less comprehensive when it came to documentation and use of technology when today's process was reviewed through the SECI- and SYLLK-model but also due to the fact that a new IT-system is partially implemented in the organisation, but still not at the project

department. Furthermore, as the department is project oriented it becomes natural to investigate how learnings are identified in past projects and implemented in new ones.

Wallenstam is a fast-growing organization where different departments are working in different IT-systems that has been developed to fit to their specific needs. The development of a new information management system was created, as an attempt to create a system that is used across the different departments, to making information more easily accessible and the distribution more effective. The system aim to decrease the amount of different systems used today as well as giving the management better overviews over the work going on in their departments. However, the aim has also been to make information available to everyone that needs it and fix old bugs from the previous system[1].

As time is always scarce in projects, documentation is often something project managers do not prioritise, even though this is of high importance (Rakos et al., 2015) to be able to effectively distribute and store lessons learned (Terzieva, 2014). A challenge will be to document in a simple way, store and distribute information so it becomes easily accessible and provides value to future projects without becoming a too time consuming to the project secondary task[2].

1.2. Problem formulation and research questions

It is vital to learn from past projects in order to prevent doing the same mistakes over and over again. Part of this is to identify, disseminate and apply lessons learnt from previous projects (S. Duffield & Whitty, 2015). For every project executed, organisations is offered the opportunity to learn, optimize what they do and hence maintain their competitiveness (Terzieva, 2014). This leads us to the research questions, which includes a review of how learning from projects appear today in the real estate sector. However, the main research questions concern *if* and *how* project retrospectives and an IT-system could be valuable in the process of identify, disseminate and apply lessons learnt. The investigation will be based on a literature study and a case study at one real estate company.

What this thesis aims to contribute with in terms of project management is to investigate how a learning from experiences process could be designed to identify, disseminate and apply learnings from past projects in order to be more effective in the future. In particular this thesis will investigate the potential of IT-systems and how project retrospectives could be used to facilitate the process of capturing learnings, share them and finally apply in a new project and context. A case study have been conducted at Wallenstam to study how their new developed IT-system could be used to help them sharing learnings in between projects and project retrospectives as a way to structure this process.

[1] System administrator, Wallenstam, interviewed the 19th of February.
[2] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.

RQ1: How does the work with identifying, disseminating and applying learnings by experiences from projects take place at Wallenstam today?

RQ2: In what way could the new IT-system support the process of learning from past projects at Wallenstam?

RQ3: Could project retrospectives be used to contribute in the process of learning from projects at Wallenstam?

1.3. Limitations

The whole project department have been part of the research but the main focus has been on the rebuilding group. This due to the authors' position as hired by this group, which has generated a deeper insight but also that investigating the whole departments' processes in detail would be too comprehensive for this thesis. Further, one could investigate calculation numbers more comprehensively to plan budgets, which is not part of this thesis.

2. Theory - Knowledge management and learning from experience

The aim with knowledge and information management is to withdraw findings gained from the past in to new situations (Baskarada & Koronios, 2013). This challenge includes to capture the right knowledge and apply it at the right time. By doing this efficiently competitiveness is created (North & Kumta, 2018). The following chapter is initiated with an introduction to information and knowledge management followed by the SYLLK-model, which was used to investigate what elements of Wallenstams' processes to learn that was in need of enhancement. While focus resulted to be on the elements of technology and processes theory further concern how technology can enhance accessibility to information and project retrospectives to identify and disseminate learnings in an explicit process. Finally, the SECI-model is included to describe how knowledge could be created through this perspective, the model was used to evaluate how the new process could support knowledge creation.

2.1. Information and knowledge management

Knowledge management intend to derive knowledge and facilitate competence from the relevant information captured in organizations and hence make use of it as a business advantage. In a competitive business market knowledge and information management is a necessity for organizations to develop their processes, maintain their efficiency and sustain a competitive position. The overall purpose with the process of knowledge management is to alleviate ascending operational efficiency and innovation to fulfil the organizational objectives (North & Kumta, 2018). What this means is to make use of data and experiences, in other words consult the past, share and distribute it so that others can improve and optimize their work in the future. If knowledge management is not taken seriously organizations risk doing the same mistakes over and over again (Terzieva, 2014). Nonaka and Takeuchi stated in the SECI-model, which is to be discussed in a later section, that the main challenge in knowledge management is to convert tacit knowledge into the explicit form. The reason for the very importance of this conversion is that organizations and its employees can only make use of knowledge expressed in an explicit form (North & Kumta, 2018).

North and Kumta (2018, p13) define knowledge management as follows:

"Knowledge management enables individuals, teams and entire organisations as well as networks, regions and nations to collectively and systematically create, share and apply knowledge to achieve their strategic and operational objectives. Knowledge management contributes to increase the efficiency and effectiveness of operations on the one hand and to change the quality of competition (innovation) on the other by developing a learning organisation." (North & Kumta, 2018).

Information and knowledge management could be described as arranging the steps of the knowledge ladder. This does include ensuring compatibility of data, structure information so it is easy to access as well as create incentives to encourage action. By processing and sharing know-how and best practices productivity and the effectiveness of processes within an organisation could be enhanced. The structure of the organisation

should be arranged in a way that support cooperation and exchange of information. Organisations must not only embrace learning as a critical part of knowledge management but also the importance of unlearning and disregard redundant information (North & Kumta, 2018).

Knowledge management is a process where numerous aspects must be in place. Reward systems must favour collaboration and transparency along with recognition of the link between knowledge, learning and performance. The values and structure of the organisation will impact knowledge transfer. Mentoring, cooperation projects, personnel rotation and experience exchanges as well as sharing manuals and information facilitate learning and optimisation of processes. Beside these factors, the structure and design of information systems could be vital to optimise the flow of information (North & Kumta, 2018).

2.2. SYLLK - Systematic lessons learned knowledge

The SYLLK-model will be used to evaluate today's process of learning from projects to determine what elements are the weaker once and will require enhancement to strengthen the overall process. This model contains several elements and facilitators that should be aligned for a lessons learned process to be efficient. The process of learning from the past could be explained in three phases, which are *identification, dissemination* and *application*, which means capture, transfer and implement knowledge and information gained from the lessons. SYLLK, *systematic lessons learned knowledge,* is a model to learn from projects based upon how the nuclear and aviation sector worked in order to avoid disaster. It highlights the importance of alignment of the people and systems embedded in an organization where people are a segment that includes *learning, culture* and *social* elements while systems includes *technology, processes* and *infrastructure* as illustrated in figure 1 below. The model aims to use and organize data, information and knowledge in order to achieve continues improvements (S. Duffield & Whitty, 2015).

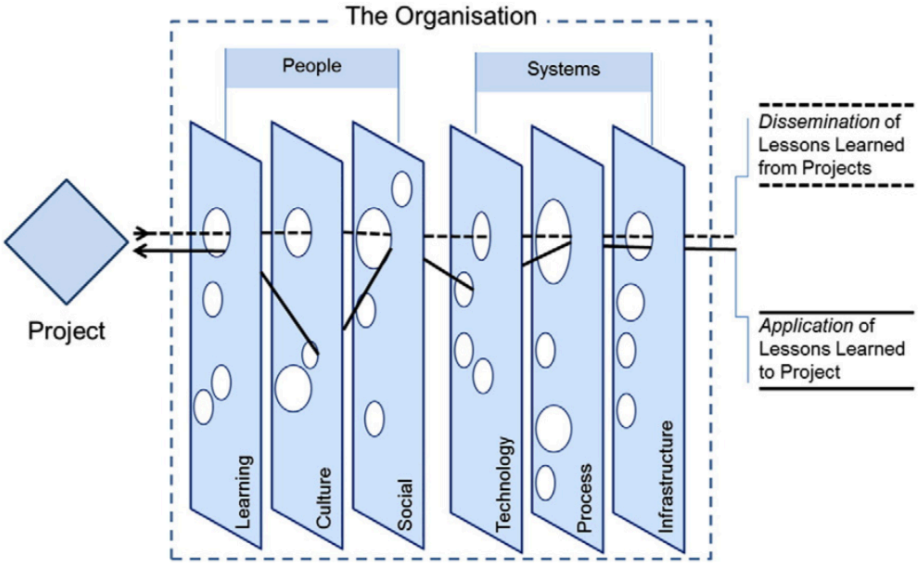


Figure 1 The holes in the different elements represent facilitators for learning, which will work most efficient when well aligned (S. Duffield & Whitty, 2015).

To understand the learning facilitators and barriers embedded in the elements is vital when designing a leaning system that aim to align the elements in a complete learning from experience system. Following is a section revealing facilitators and barriers to be aware of when evaluating and creating a learning system according the SYLLK-model.

People – learning

In the element of learning for people included is the access to knowledge or skills that could help individuals being more efficient. Important in this is easy access to relevant information when needed. Libraries containing lessons learned and shared stories could therefore be useful where willingness to share and exchange ideas based on fact rather than opinions is valuable. Hence, activities like mentoring, workshops and preparedness to share and listen is associated to learning (S. M. Duffield & Whitty, 2016). A systematic way to gather learnings from projects are through post projects reviews, distribute them through lessons learned libraries and finally apply these findings from previous project in new project where new knowledge is created (Schindler & Eppler, 2003). This includes to make use of own and others experiences and use input from people at other positions or industries. Barriers could be time pressure, loss of people and knowledge with them as well as not being able to network with those having more experience (S. M. Duffield & Whitty, 2016). Conflicting aims are usually also an issue hindering learning from projects. As the organisation and partakers only exist until project completion, the interest to discuss learnings are often low when ending a project. (Schindler & Eppler, 2003). Finally, if having lessons learned workshop but not effectively distributing the learnings but storing them in shelfs will hinder efficient learning (S. M. Duffield & Whitty, 2016).

People – culture

A learning organizational culture must be in place to facilitate dissemination of lessons learned. The culture and atmosphere need to be just and understanding, if not, people will not provide correct information about what went wrong due to shame and blame. That project participants without fear of further action can document mistakes, reason to them and other failures is fundamental to even start the implementation of a knowledge management system. The link to organizational objectives and to have values contributing to learning is also of importance and correspond to the culture (S. Duffield & Whitty, 2015). To create environments where employees feel trust, have good relationships and the organisation long-term perspectives are important to facilitate transfer of knowledge and tacit knowledge in particular (Ekambaram, Stene, Dahl, & Tradin, 2016). Furthermore, openness and exchange of ideas in between colleagues are facilitators that support the learning process. Hinders to achieve a good culture are poor communication, lack of leadership and trust and that corporate knowledge is not being shared (S. M. Duffield & Whitty, 2016).

People – social

This element includes arrangement of the social structure, how people being structured to enable relationships where exchange of learnings could take place. Mentoring could be part of this but also different forums where employees, communities or those with special insights can meet and discuss. This could include breakfast meetings, joint lunches or other forms of team meetings (S. M. Duffield & Whitty, 2016). Concerning

tacit knowledge, it's claimed that it transferred most effectively between individuals and that mentoring is a meaningful social-based activity to support this kind of knowledge transferring. The social element also includes to acknowledge, reward and recognize work achieved by individuals or teams. Poor treatment of employees as people creates an unwillingness of sharing information and lessons learned (S. Duffield & Whitty, 2015). Schindler and Eppler (2003) also describes that lessons learned often are shared informally or occasionally at more structured meetings but to institutionalise them in a structured way too is favourably (Schindler & Eppler, 2003).

System – technology

As businesses are growing the need for technologies that support identification, dissemination and application of knowledge increase (Sian Lee & Kelkar, 2013). Required from the system is a technology to capture and store knowledge. As this will facilitate and enable learning, training in the IT-system is also critical. The aim with technology is to make information available, which need could be filled by intranets, search functions and different types of "knowledge libraries". The technology is a medium for communication, from where one should be able to find where knowledge could be found within the organisation. It should make templates and process available and other tools to facilitate learning. Barriers could be lack of compatibility as well as updated and effective tools (S. M. Duffield & Whitty, 2016). Creation of knowledge libraries shared by IT are an effective way to facilitate learning in between projects. However, the learning should take place within new projects with learnings rooted in previous ones (Ekambaram et al., 2016).

System – process

The process element to learn includes clear guidelines of how to consistently deliver best practices. It includes strategic decisions shaping a framework with processes and templates to be applied. These must not be too bureaucratic and complex. The process should be easily understood where also checklists and forms are good supportive tools. The process bust be designed to fit and deliver best practise for the particular business. Good measures to facilitate the learning is lessons learned reviews and building performance evaluation forums. As these effectively can identify learnings the reflection in it-self also facilitate learnings effectively (S. M. Duffield & Whitty, 2016). Feedback is not something one will receive implicitly but have to be built into an organisations process, where retrospectives is a suitable form (Kerth, 2013). An important question that need to be clarified is also whom participates and when a project retrospective should take place (Schindler & Eppler, 2003).

System - infrastructure

Finally, supportive infrastructure meaning co-location of staff and communal knowledge work areas. In other word this means to arrange an environment where the employees have the possibility to learn from each other also in less structured manners, where conversations should be promoted. Included is both accessibility through IT as the availability to support by the management (S. Duffield & Whitty, 2015). Barriers could be different databases, consultants and locations. Poor filing leading to poor retrieval and unreliability of IT will hinder the process of learning (S. M. Duffield & Whitty, 2016).

For the learning process to be efficient these elements should be linked and aligned. If it is not, then it will affect the overall learning process. If the physical spaces are not well arranged to support open communication, then the process will be affected. If the IT-system is not well-developed accessibility to shared lessons through the medium will be affected and no longer easily accessible. The culture and social structure is dependent of the management and so on (S. Duffield & Whitty, 2015).

2.2.1. Phases of the SYLLK-model

While the above presented elements are part of the overall lessons learned process the SYLLK-model could also be explained in the phase's identification, dissemination and application of learnings (S. Duffield & Whitty, 2015).

Identification of learnings is the phase best executed by organisation today, but common is that they treat it, including its tools as being the complete process. This puts organisations in a false belief that they have a working system to make use of lessons learned but as a matter of fact they only identifies them. Tools and techniques of this process includes reflection, post-project reviews, after action reviews, lessons learned session' and close out sessions. In this phase, the following questions are often discussed (S. Duffield & Whitty, 2015, pp. 314-315).

- *What was supposed to happen?*
- *What did actually happen?*
- *Why was there a difference or variation?*
- *Who else needs to know this information?*

When it comes to dissemination organisations often fails to deliver. Dissemination refers to codifying, investigating, storing as well as searching, retrieving and sharing the knowledge gained. While all the elements influence the process of dissemination IT is often a critical tool to store and make information available. Even though IT is a critical tool it is often blamed to fail the dissemination, important is that it is a tool to support learning and sharing of information rather than an alone standing solution. One should be careful with putting all faith in IT-systems. However, two methods of dissemination are highlighted by Duffield and Whitty, process based and social based. The process based methodology concerns dissemination of learnings by reflecting up on knowledge and updating an organisations policies, processes and procedures. The social based methodology is to transfer lessons learned that are not easily transferred through mediums. These learnings are most effectively transferred through interaction between individuals. Both networking and mentoring are stated to be two successful social-based processes to transfer this kind of knowledge. The SYLLK-model intend to include both the social-based and process-based method to disseminate learnings (S. Duffield & Whitty, 2015).

The most challenging part in the process is often said to be the application where organisations seldom manage to implement the knowledge captured. As all individuals tend to learn differently, cognitive understanding is of great importance. Not only individual behaviours must be understood but organisational ones too. The effectiveness

of tacit knowledge in a learning process must also be recognised. A supportive tool for organisations and project managers is decision support created from learnings of the past to avoid same mistakes executed and optimisation of performance in the up-coming projects (S. Duffield & Whitty, 2015).

2.3. Project knowledge management – Measures to strengthen the technology and process element

While the elements of the SYLLK-model were analysed it was determined that focus will be on the technology and process element because these were identified to be the two weaker once and where enhancements has most chance to strengthen the overall process.

The documentation of a project is essential and in the start-up phases it is the only thing produced. Even so, when time is scarce documentation is one of the first things where project managers often compromises. By standardizing documents, using templates and same layouts, communication between stakeholders will be enhanced and a mutual terminology created. The documentation must be precise and compact to make it easier for the retriever to grasp the message. Except documentation of requirements, plans, budgets, communication, risk and quality plans every project carried out should end with a post-project report. This to document lessons learned through the project by creating an alone standing document including how the project was initiated and how it was running. What were successful in the project and what did not go as well that need to be dealt with differently next time should be stated (Rakos et al., 2015).

2.3.1. Lessons learned from projects and retrospective reviews

While all projects may be unique, it does not mean that there are no similarities one can learn from and incorporate in future projects. For every project carried out organizations and individuals have an opportunity to acquire new knowledge and optimize their processes. Similarities in projects that methodologies often refer to are project phases, processes and templates to be used. To document what assumptions and decisions that are made is one way to store and share information from projects. A key to help others to improve project management skills is to share lessons learned (Terzieva, 2014).

To learn from previous experiences can be done with different approaches whereas the most conscious method is the retrospective approach where focus will rely. This is when learning from experiences by looking back at projects, analysing and discussing what consequences that have occurred from different actions (Terzieva, 2014). As stated by Kerth, retrospectives are most of all about learning and without information about previous performance, learning cannot occur (Kerth, 2013). Lessons learned could arise from both mistakes and successful actions. From these actions' conclusions are made and favourably written down so that it could be processed and shared to others. Even though that the retrospective approach to learn from experiences is proven to be effective in project knowledge management many claims that there is no time for retrospective analyses (Terzieva, 2014). To stop and reflect after a finished project is seldom a task with high priority. Yet it is the key to make sure that not the same mistakes are repeated in the next project (Kerth, 2013). Common is also that companies are not aware about that they do perform a retrospective analyse but rare is that

companies do perform retrospective analyses in a formalized way with the intention to create new knowledge from it. However, the analyses will provide management with a better insight to what are common causes of variation and what the special causes of variation are (Terzieva, 2014). Reviews are more effective if carried out with other project participants. Then the project manager gets a chance to listen what others have to say about actions and consequences as give them feedback too. Often it is easier to determine others mistakes than one's own (Kerth, 2013). Finally, these insights could be used to plan and prevent similar mistakes or use of learnings gained when planning the upcoming projects (Terzieva, 2014).

That participants in the review feel safe in the group is critical. This includes that all participants must feel that they can be honest and that no retribution is made upon what is said in the review. This feeling must be maintained and monitored by the initiator. One also needs to ensure that not a blame game is established at these meetings, if this occur it is seldom something useful withdrawn from them (Kerth, 2013).

2.3.2. Design and content in retrospective reviews

As organisations and industries are different and have different critical success factors, focus of their reviews have to be customized to suit their needs (Rakos et al., 2015). Reviews should be designed after specific projects and how they have been carried out (Kerth, 2013). But to initiate with Nelson (2008) states that a retrospective have three main measures of project success, which are (Nelson, 2008):

- Was the project delivered on schedule?
- Was it delivered within the budget?
- Did the project meet the requirements?

While the answers to these questions determine the result of a project Duffield and Whitty (2015) brought up some standard questions that identifies lessons to be learnt. As also was touched upon in the SYLLK-model, these questions are (S. Duffield & Whitty, 2015):

- *What was supposed to happen?*
- *What did actually happen?*
- *Why was there a difference or variation?*
- *Who else needs to know this information?*

Rakos et al., (2015) fills in with that both what was successful and what need to be dealt with differently next time should be reviewed (Rakos et al., 2015). By only focusing on the mistakes one misses a lot. One should bring learning from the project such as real numbers, this is a great time to analyse captured figures, which can be used to future scheduling and budgeting (Kerth, 2013). Some information about the initiation and how the project was ran could also provide the retriever with information so one easier understands why certain things occurred as they did (Rakos et al., 2015). Furthermore, the retrospectives could serve different needs depending how it is executed It could concern capturing of data, to repair damages in the project team, to enhance processes, procedures, management and culture as capturing wisdom (Kerth, 2013). To conclude

reviews needs to be precise and compact so that it is clear to the retriever what the message is. Standardised documents will also facilitate creation of a common terminology between stakeholders and to make reviews easier to fill in (Rakos et al., 2015).

2.3.3. How to use retrospective reviews

Due to the fact that retrospectives are not a naturally task of the project it must be formalised and recognised as an important ritual to finish projects with (Kerth, 2013). Retrospective reviews, IT and individual conversations are effective tools in order to identify and disseminate lessons learned. Considering application of project retrospectives Hartmann and Dorée (2015) suggests a social-based approach of learning besides the traditional approach where it is one sender and one receiver of information. According to the authors, learning will be more efficient if connected to the practice and supported with discussions (Hartmann & Dorée, 2015).

As social interaction is an effective channel to transfer knowledge between individuals, where it is still a sender and receiver, the authors suggest that the demand for new knowledge should be derived from a new project embedded in its context where the learning will occur. This is based on the belief that learning appears to be more proper and efficient when taking place as a social activity within its natural context rather when someone is sending you something to learn. The authors claim that learning is not something that only take place in peoples mind but as something require interaction with daily activities in order to accomplish the task at hand (Hartmann & Dorée, 2015).

According to this perspective knowledge is explained as a process of knowing and interconnected with people and practices (Hartmann & Dorée, 2015). This view of social learning could hence be connected with projects reviews that have been documented. The evaluations will then be relevant for project managers to review and reflect about in start-ups of new projects facing new challenges or when problems are encountered in projects. In this manner learnings may not straight forward be extracted from the review, but as the project manager takes part of the learnings, interpret them and applies what is possible in the new project at hand including its context and affected by the managers own experience learning will effectively appear. Instead of seeing knowledge as a good easily transferred this approach facilitates creation of tacit knowledge as the project manager self unfold learnings from previous reviews as being guided and directed from the objective of the new project. However, the reflection after projects is as important in order to transfer what is explicit and preferably this could be done with peers. Finally, the aim after reflecting, individually as with peers, unfolding reviews in new contexts is to institutionalize information and knowledge in the new standards and processes (Hartmann & Dorée, 2015).

2.3.4. IT to store and disseminate information

With the modern techniques information systems have become a major part of managing data and information in the business market of today. The information systems must be arranged in a way so those who possess information, and possibly even knowledge, can provide the system with content and those in need easily can search and retrieve it. By doing this, the aim is to make the right content available, at the right time

and place to support the operational work and the process of disseminating information (North & Kumta, 2018).

The approach to information systems and knowledge management could differ whether approach to knowledge one agrees with. Some embracing the perception of knowledge being tacit and explicit often tend to focus on tools and databases to capture and manage their information and knowledge. If the organisation recognises the cognitive model, then the focus often remain on values and cultural aspects of the organisation. This due the fact it refers to knowledge as something intrinsic in their employees' minds. In this case knowledge sharing is encouraged mainly through interactive conversations and face-to-face communication to facilitate learning (Oppenheim et al., 2003). A common mistake often done by organisations is to rely too much on the technology. Systems cannot alone transfer knowledge but only information. in this case the issue is that organisation treat knowledge as something that could be stored as a product and then brought up once its needed again (North & Kumta, 2018).

As Duffield and Whitty (2015) discussed systems they claimed that despite all the available technology, there remain a great challenge of how to use it. To capture useful information from projects and hence store it in a way, preferably searchable to support application of it in the future is a task requiring comprehensive work. However, where people tend to learn from processing information in a social context using one's central nervous system organization cannot imitate but will need databases and standardized processes that will be used to support decision making. As the options are many and vary between businesses each organization need to find what suits there need and create a technical solution to store information in an easily accessible way where it can be monitored and continuously updated. IT is a vital part in the knowledge dissemination where it has great potential in support learning and sharing information (S. Duffield & Whitty, 2015).

2.4. SECI; A learning spiral

This chapter and model is included with the purpose to evaluate the learning process after implementing discussed measures to investigate whether it can support the creation of knowledge. A perception of knowledge is that it can be divided into *explicit* and *tacit* knowledge (North & Kumta, 2018). Only a limited part of the knowledge possessed by organisations are explicit. What recognizes explicit knowledge is that it is formal and well structured, making it easier to codify and transmit. Detailed process descriptions and quality documents are examples of explicit knowledge suitable to be stored and communicated with information and communication technology. The amount of tacit knowledge is much greater but hard to determine. It is tied to employees, gained by experiences and learnings by doing from previous tasks and projects where several challenges have been faced and solved. This kind of knowledge is therefore not easily captured and disseminated by systems alone. Context and reasons why actions have been carried out at certain occasions must be considered. Tacit knowledge is interconnected with human intuition and explained through that one can possess more knowledge than one is able to tell (North & Kumta, 2018). However, where some argue tacit knowledge is not transferable others states that it is difficult but possible with a kind of simultaneously processing (Nonaka et al., 2000). Finally, some claims face-to-

face interaction is a good facilitator when tacit knowledge is being shared (Oppenheim et al., 2003).

Both explicit and tacit knowledge is essential in the creation and management of knowledge. One type is complemented by its counterpart to make the most of it and enhance ones insights, expanding both quantity and quality of knowledge. Creation of knowledge takes place when tacit knowledge interacts with explicit knowledge and not only converts from tacit to explicit. There are four modes of conversion, which are; socialisation, externalisation, combination and internalisation (Nonaka et al., 2000).

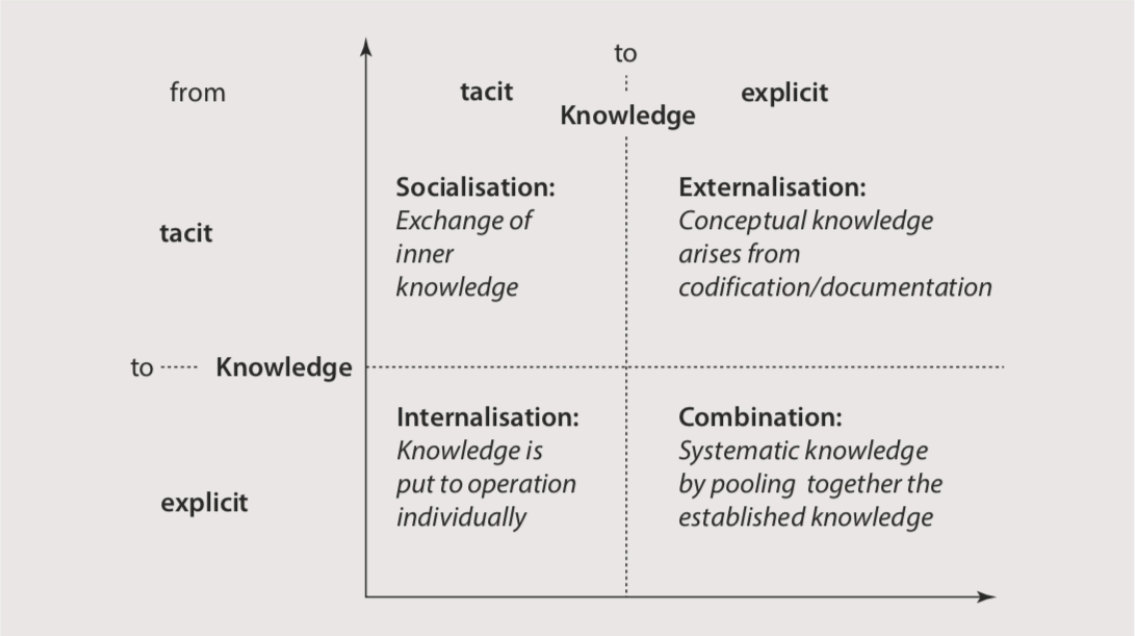


Figure 2: The figure illustrate the four ways to transform and create knowledge according to the SECI-model (Nonaka et al., 2000 p.72).

Socialisation (tacit to tacit) is the process of accumulating tacit knowledge. Due to challenges of formalising and the fact that tacit knowledge is related to a context its developed by sharing experiences rather than reading manuals (Nonaka et al., 2000). Learning appears through observation, imitation and practice. In practice its often realised by those with less experience observes those with more experience within the same field of the organisation (North & Kumta, 2018). Managers must create a working environment with possibilities for apprentices to practice and the masters to demonstrate. Finally, tacit knowledge can also be gained from interaction with customers and suppliers (Nonaka et al., 2000).

Externalisation (tacit to explicit) is when tacit knowledge is articulated in an attempt to make it explicit. It's a vital process, that if carried out successfully, will allow the knowledge to be shared and form a basis of new knowledge creation (Nonaka et al., 2000). An example of externalisation is to fill in project profiles, which with favour should be stored a database. The project profiles are to reflect over and articulate lessons learned in projects and to provide project specific information from where one could withdraw learnings to similar future projects. Externalisation also aims to enhance and optimise processes (North & Kumta, 2018) by articulating the accumulated tacit

knowledge gained over time by employees (Nonaka et al., 2000). However, externalisation can only convert parts of the tacit knowledge. Therefore, its suggested that externalisation is supported with a personal contact with those who have written the documents and executed similar projects in the past (North & Kumta, 2018).

Combination (explicit to explicit), simply means exchange and merge of explicit information and knowledge. By organising, adding and merging existing and new explicit knowledge gained through meetings and exchange of documents new information and insight may arises (North & Kumta, 2018). An example could be when information is gathered from a lot of different sources, combined and put into one larger context, like the case of creating a financial report. The mode of combination could also take place in the opposite manner, like breaking down a vision into smaller concepts that provide more sense and explicit knowledge (Nonaka et al., 2000).

Internalisation (explicit to tacit) is typically when an organisation shares explicit knowledge to individuals whom converting it to tacit knowledge mainly through learning by doing. By interpreting concepts and manuals in action and practice conversion of explicit to tacit knowledge takes place. Training programs for employees could be an example where the trainee gains understanding by reading what is already explicit. Hence, by reflecting upon what is read and facing situations at the job, this explicit knowledge could help to facilitate development of the tacit knowledge base (Nonaka et al., 2000).

As this knowledge accumulates to the individuals tacit knowledge base, new knowledge could be created and shared by socialisation (Nonaka et al., 2000). Hereafter, the loop is fulfilled and able to keep going and create more knowledge as the tacit and explicit knowledge interacts at individual, group and organisational levels as well as in between organisations (North & Kumta, 2018).

2.5. Summary of tools and theoretical concepts

To conclude, knowledge about past performance and access to information is vital when working with projects in order to prevent employees from rework and repeating mistakes (Kerth, 2013).

Project profiles and retrospectives have been identified as effective tools to preserve and then to share knowledge gained by experiences by reflecting together and if documented through information systems (Rakos et al., 2015). However, all knowledge cannot be codified and shared, which is why personal contacts with those who have carried out similar projects before is favourable when developing new knowledge in a social-based manner. In other words, applying findings in practice with this “mentor” and review as guidance (Hartmann & Dorée, 2015).

IT-systems have been identified to have great potentials to store and disseminate information and make it easily accessible by search and sorting functions (S. Duffield & Whitty, 2015).

The SECI-model explains how knowledge can be created through interaction between explicit and tacit knowledge and includes both project retrospectives, personal contacts, learning from manuals as well as combining information from different sources (Nonaka et al., 2000).

3. Methodology of the research

The following chapter describes the methodology of the research, including how the subject has evolved and how the research has been structured. How and why the different interviewees have been chosen will be explained as well as justification of why the respective theories suit the research. The chapter is structured as following; *3.1 Research design, 3.2 Research procedure* and *3.3 Data collection.*

3.1. Research design

As the research is conducted in order to explain and investigate how the information and knowledge management process could be structured and supported by IT a qualitative research approach is chosen. The qualitative approach is the more suitable approach for gaining understanding and perception of individuals including narrative answers describing the reality. It allows usage of open-ended questions, analysing of written documents as well as observations of the reality (Patton, 2005).

The relationship between theoretical and empirical data collected in the thesis could be explained by abductive reasoning. The abductive strategy seeks to explain a problem that possibly have arisen from an empirical situation that cannot directly be explained by existing theories. Hence, empirical research becomes a source for theoretical ideas where the process is iterative between the empirical and theoretical evolvement (Bell, Bryman, & Harley, 2018).

Since this thesis is conducted in order to investigate one specific case one could go even further and explain the research strategy to be aligned with the *Systematic combining* approach, a strategy based on the abductive logic. The strategy contains ongoing elaboration between empirical results and models from literature, shaping the research issues and analytical framework. Systematic combining have four main aspects that shapes the work, which are; available theories, the reality, the evolving case and the analytical framework (Dubois & Gadde, 2002).

A case study is initiated in order to provide recommendations to Wallenstam as well as strengthen the literature by combing existing literature in a unique way and elaborate it with the empirical results from the case. Case studies are a suitable approach when conducting a qualitative research, in depth focused on a specific subject affected by its actual context. The fact that case studies provide findings about a phenomena and its interacting context have over time been considered as a weakness due to difficulties of generalization but also as a strength that gives an insight to the relation between the studied phenomena and how it is affected by its context (Dubois & Gadde, 2002). This insight is something that need to be considered when evaluating the case throughout the thesis.

3.2. Research procedure

Initially the research aimed to investigate how the newly implemented information and order system could be designed to support the operation of the project department including what should be documented and saved in the system. As the research took place and theories were reviewed as well as what the department documented and

included in the IT-system it became clear that the theories and reality were well aligned in this case except at one point, which led to a change in the aim of the thesis. What had least focus and part of the daily routines was the documentation and management of lessons learned from projects.

After reviewing more literatures about documenting lessons learned it was revealed that a suitable manner to do this is through project-retrospectives. Hence, focus of the research became *how* the organization possibly could learn through implementing project retrospectives and the IT-systems role in supporting this process of capturing, documenting, distributing and applying knowledge and information gained in the past to upcoming challenges.

The research process was initiated with a literature review along with some interviews and participative observation to grasp the current working procedures and the potential of the IT-system. With this knowledge the main part of the theory section could be created where the final interviews with project managers mainly aimed to go in depth and investigate how the work with learning from past projects took place today and their taught about how it could be done in more structured processes in the future.

The theory is initiated with an introduction to information and knowledge management followed by the SYLLK-model, which were used to evaluate the current learning process and to determine in which elements further focus should rely on. As this resulted in focus upon the process and technology element following theory concerns how project retrospectives could be used to structure the process and IT-system to enhance accessibility of information. Finally, the theory section ends with the SECI-model. This as an attempt to describe in what way the project retrospectives and IT-system could be part in the learning procedure and what is needed to support and fulfil the spiral of learning.

3.3. Data collection

Several interviews have been conducted in order to get an understanding about how Wallenstam is working with lessons learned and knowledge management today, how the new IT-system is used and what opportunities it offers. Therefore, some interviews have been taking place with the system administrative while others have been focused at learnings between projects, hence they included members of the project department. Both participating observations and semi-structured interviews have been part of the data collection. Participating observation in order to give the author a good understanding of the system and working procedures of today while semi-structured interviews were conducted with the purpose to review what is done today more in depth and how the organization possibly could work with knowledge management. The semi-structured interviews approach were motivated by the fact that they are following a structure but giving the interviewer some flexibility to follow up interesting topics that arise throughout the interview (Longhurst, 2003). As participant observation offers the opportunity to interact with employees and collect information from everyday situations (Jorgensen, 2015), the method were determined suitable in order to grasp how systems are used today. Some questions used in the interviews on the topic of *Project knowledge management* and learning from experiences have been inspired from the question asked

by the author Mariya Terzieva and used in her research. Hereafter follows a presentation of the interviewees referred to by position.

System administrator – Two interviews of about one and a half hour have been held with the system administrator to learn and discuss the possibilities of the system.

Project administrator rebuilding – The project administrator is one of the two super user that is testing the new IT-system. One interviewed of approximately an hour were conducted to discuss todays process and the system.

Project manager rebuilding A – This interview were focused at today's learning process as well as the new IT-system since Project manager A also is a super user of the new system. The interview was one and a half hour.

Project manager rebuilding B – This project manager has experience from other departments too, hence it were discussed how they worked, how he perceive today's process and needs that are requested.

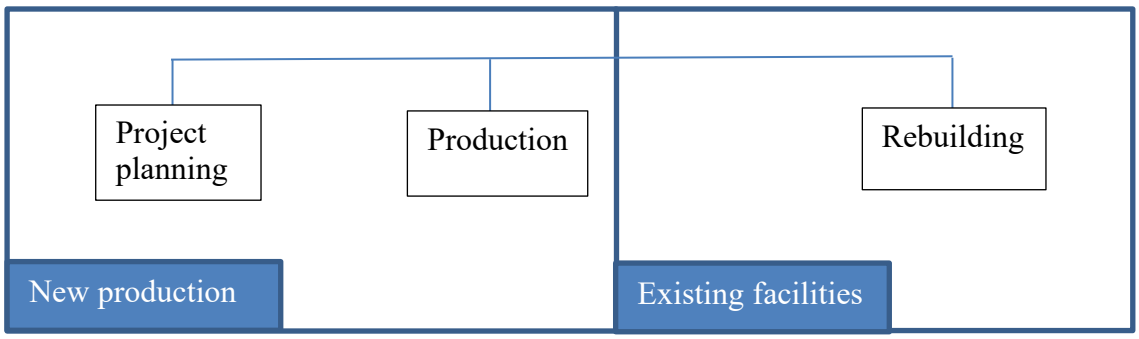
Group manager for rebuilding – This group manager have provided information of today's process as ideas and plans for the future. He have also been the supervisor from Wallenstam for this thesis.

Group manager project planning – Focus of this interview were to investigate the learning process at project planning group. The interview were held in one hour.

Group manager project production and part of the BAS group – As a result from reviewing the working procedures for new production it was revealed that they are using a decision support tool as a way to standardise processes. This tool is called BAS within the organisation, which was the focus of this 30 minutes interview.

Special advisor concerning installations. The interviewee belongs to the project planning group and are also part of the BAS group. This interviewed were 30 minutes and focused at the BAS tool.

Structure of the project department



As mentioned not only interviews and literature reviews have been part of the data collection but also participative observation, meaning being part of meetings, having discussions with colleagues as well as carry out some work oneself. Observation have proven to be an effective approach when investigating how things are done in reality (Westbrook, 1990). The author has during the research been hired by Wallenstam and located at the organizations office throughout the writing process. A risk of being an observer within an organization is that one is being biased. To mitigate this the observer could have an informant that could discuss and further explain what have been observed (Westbrook, 1990). In this case the author has not had one informant but to the highest extent tried to discuss what has been observed with colleagues. A source of information has also been two workshops arranged by the project department itself to discuss the subject of learning for experiences. Furthermore, as the thesis involves the whole project department the author has through his position gained deeper understanding of the processes in the rebuilding group than in others. This have resulted in a more comprehensive research of this departments processes to identify, disseminate and applying learnings. Review of the process in the new productions department has provided insights and ideas, and as these have been evaluated also through a theoretical perspective recommendations have been concluded to the rebuilding group.

3.4. Ethics

Wallenstam have been asked and have approved that the name of the organization is used in the thesis. Also all the interviewees have given approval that their names are included in the thesis, even though they are only referred to by position. The interviewees have been informed about the purpose with the interview and the thesis and questions have been sent to the interviewee in advance. If the interviews have been recorded approval have also been given in advance.

4. Empirical research

To begin with, the project department is divided into three groups; *project planning* who hands over to *project production,* whom are working with new production and then on the other side *rebuilding and maintenance projects* who carry out projects in the existing facilities. The rebuilding groups consists of a group manager, 6 project managers and a project administrator. The procedures of how the groups are working and managing learnings from projects differ quite a bit as also their projects do. The following chapter will be organised as follows:

4.1. The learning process of today in rebuilding projects. Here it will be revealed how the rebuilding group is working with learning, information and knowledge management today. Elements and learning facilitators from the SYLLK-model will be reviewed.

4.2. Learning facilitators used in new production. What facilitators and tools that are being used in the other project groups are being evaluated to be able to analyse measures and ideas that potentially could strengthen the process of learning and managing information at the rebuilding group.

4.3. Needs to enhance the process of learning from experiences. In this section different needs that have been identified through interviews, workshops and observations are revealed. As this have been an abductive process with systematic combining where it was detected that technology and process were two weaker elements of the learning process. Hence, in the end of this chapter focus is on the use of IT and how the use of project retrospectives could strengthen these elements and the overall process of learning. This is presented in chapter 4.3.1 Request from the project retrospectives and 4.3.2. Potential use of the new IT-system. The needs revealed are what the interviewees have expressed in the interviews.

4.1. The learning process of today in rebuilding projects

The topic of lessons learned is frequently discussed within the department today and both meetings within the management and workshops with the project managers are being arranged as an attempt to structure the learning process from past projects and optimise the tools they have at hand. Connected to this is an organisational objective saying that Wallenstam aims to supersede their customers, which also have triggered the discussion of learning from experience.

4.1.1. Informal learning process

As the procedures to learn from rebuilding projects today were reviewed one could notice several elements being in place and arranged well aligned with theoretical models to facilitate the learning process. However, there is currently not a clearly identified process of how to capture, disseminate and apply learnings from projects[3]. The work with learning from past experiences rely a lot on the infrastructure of people. The whole group have their office desks located together, which supports an environment where

[3] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.

the colleagues can hear about what problems and challenges others are facing, interrupt easily for small chats and generally create an awareness of who have experienced what. This awareness is a key along with the open culture in the working group where colleagues discuss projects and without hesitation asks for advice from others they may think have faced similar challenges[4]. That the project managers have different backgrounds and experiences have provided them with different skills and knowledge, which is valuable in the process of learning. A lot of experience relevant to rebuilding projects is held by facility managers and customer managers whom often can provide information about what have been challenging and important to bear in mind when executing projects in the existing facilities[5]. Looking more specifically at problems and learnings they are mainly dealt with and discussed as they occur[6]. However, if repeated problems are noticed they often goes to the group manager for further research[4].

When starting a new project the type of project plays a significant role of the information one have available. In maintenance projects the facility manager will be an important source of information. In rebuilding projects, colleagues and consultants responsible for specific facilities holds a lot of information that will be exchanged in conversations. The consultants have a couple of facilities that they are always responsible for, this provides them with experience from past projects in these facilities that are brought into new ones[4].

Organised reviews of contractors is not part of the process in rebuilding projects today. This is something implicit that takes place in conversations where questions about how they have performed in similar project before typically are discussed[5]. Reviews of the project managers own performance is mainly individual and not documented. Possibly there are some informal discussions with the group manager with a brief evaluation about the project[4].

4.1.2. Formal meetings concerning learning from experience

Continuing with reviewing in which forum learnings are more frequently discussed and projects reviewed there are mainly three forums mentioned concerning rebuilding; weekly group meetings, start-up meetings for new projects and monthly project balancing meetings[4]. Neither of these appointments are dedicated for lessons learned or documenting and distributing information and knowledge between projects. However, the weekly meetings are mainly dedicated to gather the group and discuss what information that need to be sent out to different stakeholders affected by the ongoing projects. This along with some small talk in between the project managers, which sometimes leads into discussions about what challenges one is facing and if anyone else have been in similar situations or have any other advices. To briefly discuss upcoming challenges in order to see if any of the colleagues have some useful guidance is something that could provide more knowledge exchange. While the meeting could help connecting managers searching and possessing specific information, these two could after the meeting keep discussing the subject in more depth. Exchange of personal

[4] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.
[5] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.
[6] Project administrator rebuilding, Wallenstam, interviewed the 26th of March.

experiences could effectively take place in conversations, which also helps with personal development[7].

As understood the project balancing meetings focuses on the economy of the projects. Participators are controllers, economists, the group manager and the project managers are rotating. Not much is documented and distributed concerning learnings but as the group manager is participating when all project managers declare the economy from their projects he becomes an important source of knowledge and creates an awareness of what is happening in the different projects. Discussions concern how different factors have affected the economy and what is ahead that potentially will have large impacts on the economy of the project[7].

The start-up meetings take place at the same time every week where concerned facility manager, customer manager, economists along with the rebuilding group manager invited by the person that signed a new customer. Here it is presented what is required from the project and the different stakeholders can easily exchange important information about what need to be considered about the facility, new customer etcetera[8].

4.1.3. What is documented concerning learning from experiences

While looking at the documentation of information from projects a folder-structure is used where the project manager saves all documents concerning the project. Nothing is in particular focused at learnings. There is no search function within this structure, which mean one needs to know exactly where to look if one wants to get an insight in someone else's project. This making the information hard to access and mainly for the project manager who run the projects himself. Even though, valuable information and documents could be found and reused by other project managers if one knows where and what to look for. Thanks to the awareness created in informal discussions at the office this is still possible to some extent, but it is harder when employees are new or resign. What is reused from these folders mainly consider documents like contracts that have been used in similar projects, which could be reused as a base in future projects[7]. Sometimes also mail conversations concerning difficulties that have been discussed throughout a project may also be saved in the map structure but hence also mainly as a support for the project manager self to go back to[8].

Going back to the creation of new contracts, journals for meetings with the new tenants or project planning with consultants there are forms available as a help to structure and to not forget any information needed[7]. All these forms and templates are today available in a separate library called WIPS. While discussing forms there is also a document called "office standard", which is a folder consisting of pictures and descriptions that could be used both to show customers what the basic office standard includes but also as support for the project manager. However, this document is not continually updated or reviewed, due to an idea of developing a standard or decision support known as *BAS*

[7] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.
[8] Project manager rebuilding A, Wallenstam, interviewed the 25th of April

also for rebuilding, which today is used only in production of new apartments[9]. This tool will be further discussed in a latter section.

Finally, what is documented are all the errors reported, which are logged in the new IT-system. The system offers the possibilities to provide statistics with the type of error etcetera, which today are not yet systematically used, else than that it at some occasions have been presented at the monthly department meeting.

Furthermore, customer surveys are used as an attempt to learn from experience. During the same workshop that have been previously discussed the use of customer satisfaction surveys was brought up and how they are used regarding learning from experience. For projects concerning commercial areas the survey contains questions about the whole process from showing to signing and then through the rebuilding project to the tenant moves in. Only a few questions concern the actual project and the project managers did not feel that they gained a lot from the surveys except if there was something not completely done[10].

4.2. Learning facilitators used in new production

The review of information management and learning from experience for new production projects were carried out in order be able to analyse whether any of these tools and processes could suit also for rebuilding projects. Hence, the following sections will briefly introduce how some tools and process are dealt with within these project groups.

To initiate with, a folder structure is used even in these groups but mainly for documents not meant to be shared. The storage of documentations takes place in a software called iBinder. A tool that they feel fulfil their needs of documentation of comprehensive projects in a good manner. For every project a binder is created where documents are saved and structured. In these it is easy to share accesses so also consultants and architects easy can access and store documents they need. Furthermore, important documents like contract one need access to but not to be shared are uploaded and stored in WIPS where also the BAS standard is stored[11].

This BAS is a document aiming to give decision support for both project planners, consultants and architects about how to build good apartments cost efficient[12]. This decision support tool exist in several editions aiming to give support in different elements. While it is designed so that in some cases it contains specific products that should be used and within other elements there could be options to choose among depending what type of apartment one is building[13]. Included are also some checklist to support the process[12]. By following this documents when designing and planning a project one could say that both the process and also some products becomes standardised. This document is updated as more experience is gained from projects.

[9] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.
[10] Wallenstam, workshop, the 6th of May.
[11] Group manager project planning, Wallenstam, interviewed the 17th of May.
[12] Special advisor concerning installations, Wallenstam, interviewed the 20th of May.
[13] Group manager project production, Wallenstam, interviewed the 20th of May.

Information to updates is gathered from facility managers, consultants and contractors. Suggestion for updates could be by taking contact with someone part of the BAS group or an email dedicated for this purpose. To implement tenant opinions through customer satisfaction surveys could also be useful but still a challenge where the questions asked must be carefully designed[14].

For new production some retrospective evaluation meetings with general contractors, subcontractors and consultants have been arranged after projects. During a workshop concerning learning from experience it was expressed that these meeting did not provide anything useful. It could be sensed that subcontractors did not provide honest opinions about the general contractor to not risk anything in their relationship since it is them who will sign the subcontractor for upcoming jobs. Managers expressed that they still believe in this idea but that they should try it in different constellations. To separate the meeting and invite subcontractors to a first evaluation meeting and then the general contractor to a separate one have been discussed. This meetings should be held by the project production department while project planning should be the group inviting consultants to an evaluation meeting. These reviews are not only to review consultants and entrepreneurs but also to give them the opportunity to provide Wallenstams project manager with feedback[15].

Consider feedback customer satisfaction surveys for tenants renting accommodation the questions are different from these in commercial rebuilding projects and involves the project more. These questions are investigating what the customer thinks about the result more comprehensively. Henceforth becomes more useful considering learnings from the project, which could be subject to discuss regarding updates in the BAS[15].

Beside these meetings tied to specific projects, annual evaluation meetings are held with the partner entrepreneurs. These meetings provide more valuable learnings to be considered in the partnership to make projects and the overall collaboration more easy-going[15].

4.3. Identified needs in the learning process

The following section aims to identify what needs that are requested by the interviewed project managers concerning learning and management of information. Initially, a need identified have been a dedicated forum where challenges could be discussed. A project manager previously highlighted the value of bringing up learnings and challenges to come for discussion at the weekly meetings. To institutionalize this point for discussion to the agenda of the weekly meetings is something that could fulfil this need according project manager B. This approach is already used by the customer mangers and sales where one presents which customer and spaces one will work with so that other could provide their experiences from these customers or spaces. A similar approach could be useful for project managers where one could withdraw information about upcoming challenges from colleagues and to know whom to turn to if more difficulties arise[16].

[14] Group manager project production, Wallenstam, interviewed the 20th of May.
[15] Wallenstam, workshop, the 6th of May.
[16] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.

Feedback from projects were also identified as something that could be enhanced to strengthen the process of learning. Customer satisfaction surveys were brought up as one part in this process. In the workshop it was revealed that the project managers believed that more investigating questions could provide useful information also to commercial projects. It could for example concern how the customer consider the collaboration and their own involvement in the project along with more detailed questions regarding the results. That the questions cannot be the same is clear though due to the fact that tenants renting commercial areas are part of the process to shape the area rented, which those renting accommodations are not. Although, for these surveys to be useful the feedback must reach all the way back to whom it concerns[17].

Furthermore, checklists, templates and reuse of old documents were identified as supportive tools to structure and support processes. However, if these were reviewed and updated sometimes they could be developed to be even more supportive. The development could be to make them even more detailed or for example consider to include some checklists of information that need to be gathered from tenants[16]. Forms could further support and speed up decision making[18].

Finally, project managers from the rebuilding group expressed that they believe there is potential to implement a document similar to BAS for them too. Implementing a standard for rebuilding may be harder due to the fact that these projects never looks like the other and are restricted by the existing facility[18]. However, similarities could be found and particularly when adjusting areas for tenants[16]. An idea was to include a list of specifications one could have use of when planning the project and investigating what is possible considering legal requirements and standards. Consultants will possess this information but still it could be useful for project managers that could answer questions and see possibilities faster. Concerning to withdraw learnings from the previous office standard document, managers perceived to be hard since this was too much of a nice sales document to attract the customers. To be useful for project managers it must be very clear and unambiguous[18].

4.3.1. Request from the project retrospectives

To finish projects with a retrospective review have already been discussed as something that could provide good feedback to stakeholders of a project but only in the form of meetings. This section investigates what some project managers believe about filling in a retrospective form as well as how it could be used to potentially be useful in the process of learning from projects both for the organisation and individuals.

To begin with, the both project managers interviewed stresses the risk that time is always scarce in projects and that fill in a project retrospective is a secondary task. Even though, they believe that there is potential with it if they are designed and used properly. It is always good to take a break, reflect upon what one has done and possible could have done differently, either alone or with other partakers from the project. Concerning

[17] Wallenstam, workshop, the 6th of May.
[18] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.

project retrospectives, it is important that it does not just becomes another paper to fill in. To design the project retrospectives as a form with some standard questions would make it easy to fill in and not too time consuming. Information that were requested that could facilitate learning would concern what challenges were faced, how they were solved and affected the schedule and economy. Further, the project manager B claimed it could be of use to know what learnings that the participants could withdraw from the project and if they would have liked to do anything differently[19].

A key to gain something out of the project retrospectives is that they are easy to fill in and that they in some sense becomes searchable. To compare similar projects was something revealed that could be of help and for example to sort and search among them on categories like facility, type of project, procurement type and entrepreneur was a request from project manager A. Hence, one could be able to do a quick research of who have experience from what and how those project have turned out. If implementing this in the new IT-system an idea arisen in one interview were to also include statistics of warranty errors, which possible could provide the project manager with useful information of how past performances actually have resulted. Further research could also be based on this information such as which entrepreneur have performed well or not so well, under one type of procurement, in this facility they had a lot of problems with this or this entrepreneur had way more warranty errors than another one[20]. Taking it one step further, to make the information even more accessible an idea from project manager B for the future were that reading suggestions occur when one is filling in one's own project journal[19]. The discussion of potential storage and use of project retrospectives leads us right into looking further at how the new IT-system could be used, which is the subject for the next chapter.

4.3.2. Potential use of the new IT-system

The new IT-system was initiated partly due bugs in the previous customer and order system but also as an attempt to create a mutual system across department boarders. With this system the aim is to gather information and make it more available for the ones in need of it and by that optimize their work[21].

What is already possible today is to gather statistics in different manners on reported errors as illustrated in figure 3. This back-log could provide valuable insights that have potential to be subject for discussion when updating the BAS standard for example, even though it is not today[21]. The information could also become useful at evaluation or start-up meetings with entrepreneurs. Hence, one could make them aware of how previous projects have turned out, see what errors that have occurred from them and discuss how they could be prevented in the upcoming projects[20].

[19] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.
[20] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.
[21] System administrator, Wallenstam, interviewed the 19th of February.

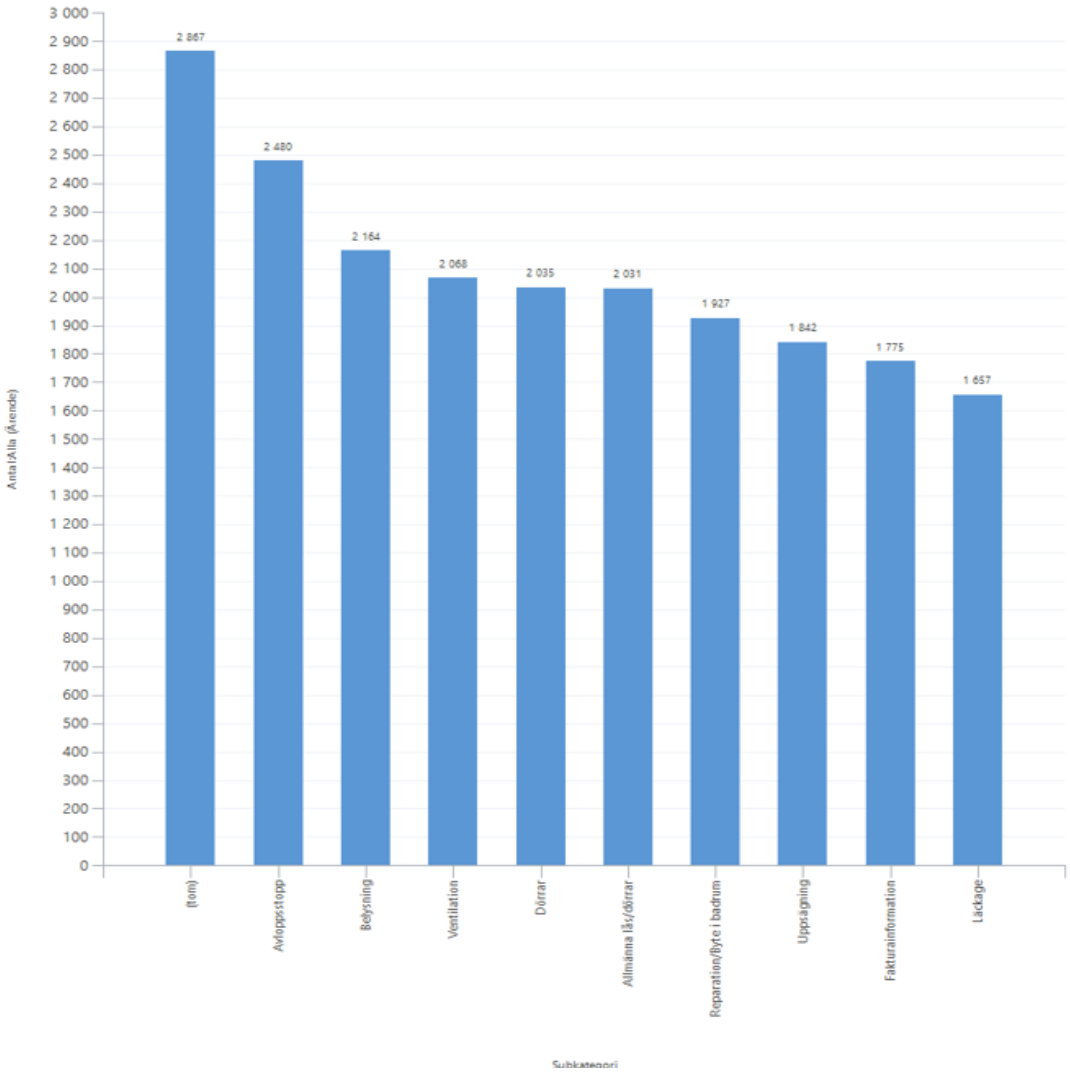


Figure 3: The table is an example from the newly implemented IT-system of how statistics could be presented. This example is amount of reported errors sorted on category in a specific facility.

Furthermore, it has also been discussed to implement both WIPS, the library for forms and templates, as well as the whole folder-structure where all project documentation is saved into the new IT-system[22]. Regarding WIPS one can already create contracts from the new IT-system and get some formalities filled in. Besides it could provide the group manager with a good overview if he immediately sees in what stage the project is in and all uploaded documents[23]. To have a structure with documents to be uploaded could also help the project manager to know what documents that will be needed in each stage to not forget anything, hence it would also be easy accessible for others looking for help to similar projects[24]. This could then offer a structured storage of project documentation like the folder-structure but with a search and sorting function.

Regarding this search function there is still a need for improvement. It is not yet precise enough and provides the searcher with too much information[23]. The project

[22] Group manager project rebuilding, Wallenstam, interviewed the 11th of April.
[23] System administrator, Wallenstam, interviewed the 19th of February.
[24] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.

administrator fills in with the fact that when searching for specific facilities one does not immediately sees what the executed projects in the facility have concerned[25].

Further the program offer functions where one easily can see who have the different responsibilities, what guaranties there are, for how long and whom that is responsible for it. One could also create lists with customer information when entrepreneurs need to get in contact with them. Finally, it could enhance the process of handing over information from project manager to facility mangers for rebuilding projects. Today there is no clear process of doing this, but one save documents in the folder-structure and email some forms when the project is done. If instead all documents were uploaded in a structured way to the new IT-system information would be easily accessible and the handover seamless[26].

Tying it back to the project retrospectives and the idea to make it sortable on facilities, type of project, entrepreneur and procurement type to make it easier to sort out and read about similar projects and also compare them against each other. Hence, this could be stored under an own page dedicated for learning from projects. To rate the result of the project could possibly help the searcher to see both successful and less successful projects[24]. What else could be useful and filled in both from project and facility managers is a general *to be aware of* in this facility. This could give the project manager some quick background information about something that need to be taken into account that have occurred in earlier projects or just been known of the facility manager[27].

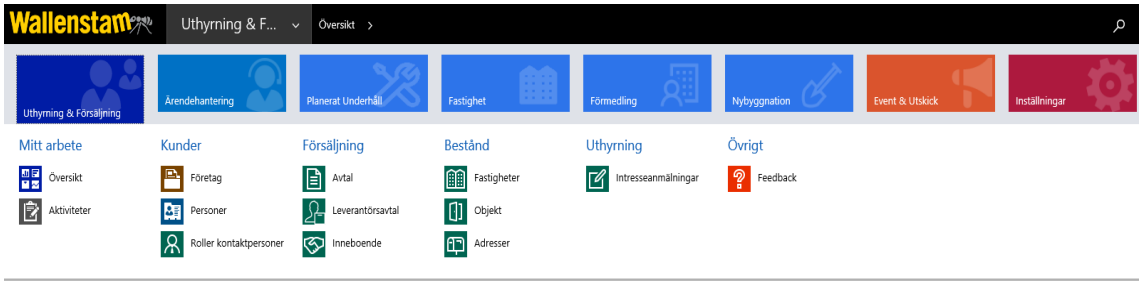


Figure 4: This illustrate todays starting view in the new IT-system, where it is requested to also include an own page dedicated for project learnings.

4.4. Summary of empirical research

To sum up how the work with learning from today appears, it have been expressed that there are no clear processes of how to learn from projects or any occasions dedicated for discussing learnings in particular. The learning and information today rely a lot on the fact that the project managers are sitting next to each other, hear what others are working with and very openly discuss each other's project. This creates an awareness of who have experienced what and by that whom one could discuss further with when facing challenges. But also whose folders to look for guidance within where all documentation is saved. What else is documented besides the documents in the folder-structure is reported errors, which statistics is not being used today. Today there are

[25] Project administrator rebuilding, Wallenstam, interviewed the 26th of March.
[26] Wallenstam, workshop, the 15th of May.
[27] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.

three occasions where learnings sometimes are discussed, but there are nothing institutionalised and focused especially at learning.

For more comprehensive new production projects a program called iBinder is used to store and share documentation within. It fulfil their needs in a good manner. A decision support tool to standardise and help both project managers and consultants is also used with the purpose to build good apartments cost efficient. Retrospective meetings have also been tested but without finding the right constellations where honest feedback could be exchanged so far. Finally, these groups arrange yearly meetings with partners that have been successful for feedback and discuss collaboration.

Considering project retrospectives to structure the learning process by being able to identify and explicitly disseminate findings gained from projects the project managers believe it to have potential to be useful. Partly because it is useful to stop and reflect for future learning, but for reviews to be used they must become searchable and comparable. To achieve that, there is good potential in the new IT-system that also could support with statistics with reported errors to show how projects have turned out.

5. Analysis and discussion

The following chapter is initiated by analysing todays process through the SYLLK-model to determine if it make sense to focus on the IT-system to enhance the overall learning process but also if any other element is in need to be enhanced for that. What were revealed throughout the process was that it make sense to focus on the technology element as a way to make information more accessible. Besides it was revealed that there are no clear processes of how to learn today, which is why focus also will rely on project retrospectives and to investigate how and if these could structure the learning process in a more explicit way. The chapter ends with a discussion of how the overall learning process, including the discussed measures could support creation of new knowledge through a SECI-perspective.

5.1. Elements of the SYLLK-model

As Duffield and Whitty (2015) states in the SYLLK-model learning from project depends on the alignment of the two segments *People* and *Systems* including the elements: *learning, culture, social* as *technology, process* and *infrastructure.* Furthermore, the process appears in three phases; *identification* of lessons, *dissemination* including storage and transfer of the gained knowledge and finally *implementation* of it to new projects (S. Duffield & Whitty, 2015).

Learning

Consider the learning element the access to knowledge is good in terms of different experiences held by the different project managers. A lot of information concerning the facility is also held by other colleagues from other positions. As other project managers and colleagues do not mind to share and support each other the access to this type of information could be considered good and being exchanged between individuals[28]. What is not in place is this information documented, like libraries including lessons learned, mentoring and other experiences gained from projects shared in an explicit manner, which could be useful (S. Duffield & Whitty, 2015). When to hold project retrospectives was an important question stressed in theory as project participant often think short term since the project organisation usually goes apart after project completion (Schindler & Eppler, 2003). However, since Wallenstam usually use same contractors and consultants in repeating projects[29] the incentive to share and learn is still there. But to include learnings as a bullet to the project journals has been suggested to grasp learnings as they occur[29].

Culture

From what has been observed by the author and confirmed by the both project managers interviewed, the organisational culture is very open and just. This appears both at individual level where a lot of information and knowledge is exchanged through informal discussions and asking colleagues while at organisational level one objective is to supersede customers' expectations, which the management partly aims to do through learning from experiences[29]. Duffield and Whitty (2015) highlighted the importance of

[28] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.
[29] Wallenstam, workshop, the 6th of May.

an open and just culture to even consider implementation of knowledge management systems (S. Duffield & Whitty, 2015). In an environment where the employees feel trust, have good relationships and the organisation have lengthy timeframes facilitate transfer of tacit knowledge (Ekambaram et al., 2016). Where the culture has room for improvement to become more open is during the retrospective meetings tried, which the organisation is aware of and is trying to find a suitable constellation of partakers for establish a culture where honest feedback could be exchanged[29]. The question of whom that should participate was also stressed to be important by Schindler and Eppler (2003) to create a facilitating atmosphere where feedback could be exchanged (Schindler & Eppler, 2003).

Social

Concerning the social structure, forums where employees could discuss information and learnings from experience a lot today rely on this. Most experiences are exchanged in conversations either in the weekly meetings or start-up meetings and if not it appears in the office between project managers. People are open and willing to share what they know[30]. This procedure is align with how Schindler and Eppler (2003) discuss how lessons learned are shared, either informally or in the end of other structured meetings. To institutionalise these sharing of lessons learned are to preferred where hinders often are conflicting aims, already started up next projects and time pressures (Schindler & Eppler, 2003).

Technical

As a folder structure is used for storing project documentation where one need some background knowledge to have a chance to find information from other projects the information is not considered to be very accessible and hence mostly for the project manager itself. Thanks to awareness created through discussions and open-office areas one is still to some extent able to find some information, which could be used for guidance in up-coming projects[31]. Duffield and Whitty (2015) said that IT-systems were a medium to make information available and guide to where knowledge could be found (S. Duffield & Whitty, 2015). Hence, it could be stated that information is not easily accessible to everyone in the current situation and it needs to be further analysed how the new IT-system could be used to make information more available and direct people to where the searched knowledge could be found. To implement knowledge libraries by using technology where findings could be found and further developed in new projects have been discussed to be an effective tool to facilitate learnings (Ekambaram et al., 2016).

Process

The learning process should have a clear simple structure to retain learnings from the past without being too bureaucratic. Good examples are using supportive templates, lessons learned reviews and forums to evaluate building performance (S. M. Duffield & Whitty, 2016). While templates are part of today's process the main part of the learning process is appearing implicit or only through conversations. As Kerth (2013) stated, to

[30] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.
[31] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.

retain feedback one need to build it in to the process where project retrospectives are one way to do it (Kerth, 2013). While several things have been used in the organisation such as review meeting with entrepreneurs and customer surveys to get feedback, not much of value have been withdrawn from them concerning rebuilding projects[32]. Therefore, as a clear and defined learning process could be argued to not be in place, in order to arrange a process that not only appears in between individuals it will be discussed how the use of project retrospectives could take place to strengthen the learning process and enhance the access to learnings about past performance in a more explicit manner.

Infrastructure

The infrastructure is an aspect that today gives good support so that the elements in the people segment is working well. Included in this is that the project managers are sitting next to each other and colleagues holding information about the facility are located at the same floor. Besides if issues are frequently met these are being raised to the group manager without hesitation[30]. Location of employees and distance to management are important factors in this element (S. Duffield & Whitty, 2015). Today this generates awareness of whom to talk to and where to find information[33]. Information held by consultants was also mentioned to potentially be a hinder, but in this case where consultants are working with the same facilities over and over again it is clear where the information could be derived from.

By reviewing the elements facilitating learning through the SYLLK-model it have been noticed that the most obvious improvements concern technology and processes to make information more accessible and to capture and disseminate more knowledge about past performance not only between individuals in conversations. Enhanced use of IT and project retrospectives have been detected to possess possibilities to facilitate these aspects. While project retrospectives and better use of IT in the identification and dissemination of lessons theoretically seems to fill a gap and align learning elements one need to remember what were stated by Terzieva (2014). That every organisation needs a customized process to fulfil their needs and that there is not one receipt to create a good knowledge management system (Terzieva, 2014). With this in mind one should remember that all project groups may necessarily not need to work identical with learning from project but adapt it after their own needs and processes. Further will a discussion about how the new IT-system and project retrospectives could be used to strengthen the technology and process element as the overall learning process.

5.2. Project retrospectives

Both Kerth (2013) and Terzieva (2014) have argued that project retrospectives possess the potential to capture learnings from the past that could facilitate future knowledge development (Kerth, 2013; Terzieva, 2014). The attempt to make knowledge explicit is a vital challenge as organisations can only make use of information and knowledge expressed in an explicit form (Nonaka et al., 2000). As both expressed by the project manager A and stated by Kerth (2013) to stop and reflect about past performance is

[32] Wallenstam, workshop, the 6th of May.
[33] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.

essential to do it better the next time[34] (Kerth, 2013). From interviews with the two project managers it can be concluded that they see a potential with retrospective reviews. However, it must be done in a way so it is easy to fill in and becomes searchable**Fel! Bokmärket är inte definierat.**. How it will become searchable and easily accessible for whomever needs to retrieve information to a similar project will be further discussed in the analyse of how to use the new IT-system. This section focus on how project retrospectives structure the process of retaining information from past performance to facilitate future learning.

5.2.1. Use of project retrospectives

Retrospective meetings with stakeholder have already been tested in some new production projects, even though suitable constellations may not have been found yet as previously discussed the idea is well aligned with what have been discussed in theories, but the meeting must be designed so that a safe culture is created (Kerth, 2013), which was not the case when it was previously tested. To implement this type of meetings also to rebuilding projects were also discussed with positive feedback by some project managers from this group. Even though the entrepreneurs are not partners in the same sense there are many entrepreneurs frequently executing rebuilding projects for Wallenstam. However, the project duration is shorter, which is why yearly evaluation meetings with entrepreneurs makes more sense also for the entrepreneurs working with rebuilding[35].

If some partakers from the project reflect upon what have been done well, what could be done better and what to bring from this project this could help them to prevent doing the same mistakes and to bring new learnings. The review could be customised for the project but to do it with peers will help to grasp the bigger picture (Kerth, 2013). Depending on project size and type review meetings could then either be with consultants and contractors or only intern participants[35]. If adding documentation and dissemination of these meetings one could argue that information of past project will be more accessible and less dependent of individuals if also made available by the IT-system. As Terzieva (2014) stated to share lessons learned is one key to help other to improve project management skills (Terzieva, 2014).

To retrieve findings from reviews or get in contact with partakers from previous projects when guidance is needed in a new context is how Hartmann and Dorée (2015) suggest to apply project reviews, due to the belief that learning must be part of practice. Project reviews will then be useful in start-ups or when encounter problems. The idea is not to read and immediately extract knowledge but to be guided to whom that could support learning, interpret and bring part of the learnings written and discussed as guidance into a new context (Hartmann & Dorée, 2015). A personal contact whom could mentor the retriever of information as these learnings are unfolded in practice, where the demand for new knowledge is generated from a new project would make the learning process even more effective (Nonaka et al., 2000). Duffield and Whitty (2016) confirms that social-based activities like face to face discussions and mentoring are

[34] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.
[35] Wallenstam, workshop, the 6th of May.

great facilitators in the transfer of tacit knowledge. The findings will then be affected by the project managers own experience and applied in a new manner where creation of new knowledge occur. Hence, after reflecting again the aim is to institutionalise the knowledge gained into new standards. In this way the organisation have also gained learning through their database and updated processes in a process based manner (S. M. Duffield & Whitty, 2016).

What the review hence could provide is some background and explicit information from projects so that projects and solutions used could be compared and the right "mentor" could be found for further discussions of how challenges were handled in the previous project as what to bring to the upcoming one. To have someone sometimes mentoring was also something that Project manager B claimed could be great for personal development as the project group contains employees with a lot of different competences[36].

The structure and design of the review will be of great importance. As stated by both the interviewed project manager's and confirmed by theory time is always scarce in projects. Therefore, it is a risk it becomes another paper to fill in whom no one will ever look at[37]. But if these are designed properly, are easily accessible with a simple template to fill in including a short and concise message as Rakos et al., (2015) argues it should be, there may be potential for it to provide valuable information and facilitate learning in an easy manner (Rakos et al., 2015). Not to forget is that the reflection in itself is valuable for the project manager to think about what were good and could be improved in future projects (Kerth, 2013).

While looking at content to the reviews what is said in theory seems to be aligned with the simple questions also suggested by the project managers. First, there is the three pillars of project success, if it was delivered on time, within budget and met the requirements (Nelson, 2008). Hence, one could investigate what may have caused a variation, why it occurred and what could be done differently along with what learnings you can withdraw from this project[36]. The reviews could also provide simple information of who, project managers, entrepreneurs or consultants, that have been part of the project, which provide others with some information of who has experience from what and how it have turned out[37].

Finally, to reflect and fill in a review whom others can access and make use of in a new context with support of a personal contact or to update a process is one way to identify, disseminate and apply learnings. Still there is a risk with this being a secondary task (Terzieva, 2014) providing little useful. But as the reflection in itself could be helpful (Kerth, 2013), if the review is designed to create some short findings easy to grasp for the retriever (Rakos et al., 2015) it comes down to the accessibility, which will be discussed in the next chapter where the potential use of the new IT-system is reviewed.

[36] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.
[37] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.

5.3. Role of the IT-system to facilitate learning and accessibility of information

To begin with, having a well-developed database where organizational knowledge could be stored and easily accessible is very useful when working with project reviews. The accessibility makes it possible to not only learn from one's own experiences but also to search for and gain useful information from similar projects carried out by colleagues (Terzieva, 2014). As described the new IT-system could offer this features. On the one hand one could argue it becomes another system to work in and an extra work load. But if all documentation were moved from the current folder structure and instead were saved in the new IT-system it could possibly become a more natural part of the working procedure[38]. To store documents in the new IT-system could support the project managers to easier know what documents is needed and when in particular projects. When in doubt one could easily search for a similar project to retrieve some guidance about how it was done in previous cases[37]. In this manner one could see different partakers, documents used as well as the project retrospectives potentially. As one may argue this is already possible in the folders, the new IT-system could enhance the accessibility of information through sorting and searching functions. Further, if documents are already uploaded, the system should be arranged so that the handover of information and documents could be almost seamless from rebuilding projects to the facility managers.

Concerning accessibility, which is a key function of the technology regarding Duffield and Whitty (2015), it was suggested that besides the search function, to implement an own page for project retrospectives where one could sort the projects as a knowledge library like suggested by Schindler and Eppler (2003). Discussed alternatives were to sort on type of project, facility, and entrepreneur to make it easy to sort out and compare similar projects**Fel! Bokmärket är inte definierat.**. If combining the view where one finds the reviews with statistics of errors gathered by the system it will also be possible to investigate what issues that has occurred in the different projects. This information could be used either to create awareness of possible problems from this type of projects or in the facility but also in the next procurement of an entrepreneur to present how previously projects have turned out[39]. Besides this, guidance for future action could potentially be created. If patterns of errors could be noticed this could be subject for discussion to update the BAS, the decision support and a tool to standardise processes today used in new production projects. Statistics could show what customers have been dissatisfied with as well as what issues from the projects that have been more present. This would then need further research to determine whether it is profitable to update the process to get rid of the problem or more sustainable to leave it as it is. However, as was pinpointed by Duffield and Whitty (2015) databases and standardisation of processes are keys for organisations to learn (S. Duffield & Whitty, 2015), which make the use of the new IT-system and BAS a great combination from a theoretical perspective.

Finally, an idea to effectively distribute some information about a facility, which could support rebuilding projects, is to implement a short bullet list with things to be aware of

[38] Group manager project rebuilding, Wallenstam, interviewed the 11th of April.
[39] Project manager rebuilding A, Wallenstam, interviewed the 25th of April.

when opening a facility in the new IT-system[40]. Furthermore, as Duffield and Whitty (2015) said, IT-systems are important and possess great opportunities to share information and support learning, but one piece in the puzzle, where one needs to be careful with overreliance to the system (S. Duffield & Whitty, 2015).

5.4. How these measures theoretically can support knowledge creation

This chapter intend to depict that if the IT-system and project retrospectives are used as described in the two previous chapters, it does possess theoretical potential that could facilitate knowledge creation if viewed through the perspective of the SECI-model. As were stated in the model knowledge creation could be described as taking place through conversions between tacit and explicit knowledge (Nonaka et al., 2000). While looking at project retrospectives, reflection and documentation could be described as externalisation, the attempt to express knowledge in an explicit form. Furthermore, when applying the reviews in a social-based manner it could illustrate how explicit knowledge in the reviews facilitates the creation of more tacit knowledge, also known as internalisation. If learnings are withdrawn from reviews or statistics captured by the system and applied in a process-based manner, in other words to update processes or decision support this could be explained as combination where learning could be facilitated by reviewing several projects.

When reviewing what is done today through the SYLLK- and SECI-model it becomes clear that implementation of the new IT-system to the project department and the use of project retrospectives strengthen the organisations learning process where it could be perceived to be weaker. Those measures contain the possibility to identify and distribute lessons learned as well as enhancing the overall accessibility to information and knowledge to make it easier to apply in future projects.

[40] Project manager rebuilding B, Wallenstam, interviewed the 26th of April.

6. Conclusions and Recommendations

In the following sections recommendations will be revealed concerning the use of IT-systems and in particular the one implemented at Wallenstam be stated as well as how project retrospectives could be used in the learning process at a project department of a real estate organisation. These recommendations are based upon the literature review compared to how the organisation works today including needs identified from interviews, observations and workshops. The research questions that have been investigated are as follows.

RQ1: How does the work with identifying, disseminating and applying learnings by experiences from projects take place at Wallenstam today?

RQ2: In what way could the new IT-system support the process of learning from past projects at Wallenstam?

RQ3: Could project retrospectives be used to contribute in the process of learning from projects at Wallenstam?

Research question 1 was conducted with the purpose to investigate today's process of learning from projects in order to determine how it could be enhanced. What could be concluded were that the learning process and information dissemination today rely a lot at physical infrastructure, an open culture and interaction between individuals. What was missing is an explicit process of how to learn between projects and easy access information from projects that could facilitate future learning. Due to this fact, by reviewing the process through the SYLLK-model, it was concluded that it made sense to focus the further research on the technology and process element with the purpose to enhance the access to information and structure the learning process more explicitly.

6.1. IT-systems to capture and disseminate learnings

As continuously been highlighted in theories IT-systems contain major advantages when it comes to accessibility of information. These systems offer good possibilities to access information and documents by searching or sorting to whomever needs it without possessing information of the past. Furthermore, no separate handovers of information will be required, if documentation are uploaded immediately. Hence, the system should further be arranged so documents are made available where it should be.

The IT-system already offers a lot of statistics concerning errors from projects. If analysing why and from where errors have arisen patterns could potentially be found, which could be further subject of discussion when updating processes and decision supports, like the BAS used for new production. Standardised processes and decision support documents are also captured knowledge to the organisation. If certain errors and patterns are found in the database these could also be presented at monthly meetings as feedback from projects.

While looking further at how the IT-system could be arranged in order to store, distribute and facilitate learnings it is suggested that a page dedicated for learnings from projects is created. In this page one should be able to sort and search among projects.

Suggestively at least at project type, facility and entrepreneur to easier find and compare what one is looking for. As a project is chosen one should be able to see general formalities from the project along the project retrospective to be discussed as well as gathered statistics from the errors reported. Additional to this is an already existing multi-search. A suggestion is that one could chose a certain type of project and search for example after a specific solution. Hence, it would be possible to see where the solution have been used before, how that project turned out as well as which entrepreneurs and project managers that have experience from it whom could provide the retriever of information with further details that could be of use in upcoming projects. While a lot of this appears in informal discussions today this could be a way to make it systematically explicit and tie learnings to the organisation too.

The IT-system could in this fulfil the need of making information and knowledge easily accessible in this manner as been stated in theory by Duffield and Whitty (2016) and hence being applicable in a social-based manner in practice as suggested by Hartmann and Dorée (2015) and finally even in a process-based way if suggested tools are chosen to be used (S. M. Duffield & Whitty, 2016; Hartmann & Dorée, 2015).

6.2. Project retrospectives to identify and facilitate learnings

Continuously, to not repeat mistakes and to optimise processes people need to be aware about what have and have not been working. To reflect, document and make what is known explicit will facilitate the dissemination of learnings. To implement documented project retrospectives stored and distributed in the new IT-system is recommended.

These project retrospectives must include some questions easily filled in to share a short and concise message where more details could be withdrawn from personal contacts when one has found who possess this knowledge. The review has to be customised but at least tell what was done, with whom, how it turned out and if anything should be done differently along with what one should be aware of in similar upcoming projects. With this fundamental information derived from projects some research could be done supported by the statistic of actual errors reported. With the possibility to guidance by a personal contact from the previous project, knowledge creation could be facilitated as these learnings are developed in a new project in practice affected by the project managers own experience.

A key is that these becomes easily accessible and searchable to support project managers. However, as this is being documented and stored in the organisational database learnings will to some extent also stick within the organisation. If these reviews are filled in by the individual project manager after a small internal meeting or after a retrospective project meeting with external partakers too could differ depending the size and type of project and is suggestively decided by the project manager or group manager.

As these reviews are not measurable these could be hard or demand a comprehensive workload to analyse in the sense to update processes. Suggested is that the project managers themselves highlight if anything from the project could be of value to discuss considering changes in the process, in other words updated in the BAS.

6.3. Conclusion

To conclude, what is being recommended are not for the organisation completely unfamiliar. Most aspects have been tried to some extent, used in another group or department. No matter how IT-systems or project retrospectives are used these are not stand alone solutions but measures that could support the overall learning process for both project managers as the organisation where the standardisation of processes/decision support also could be a useful tool to look further at. A continuously updated tool that standardise a process or support decisions is knowledge captured by the organisation that will facilitate decision making in upcoming projects. While standardisation of processes has appeared as one way for the organisation to learn, to make use of learnings from past projects, demanded from a new project and develop them in practice in future projects could be a good way for project managers to learn. The project retrospectives do possess potential to identify and share learnings in a more systematic and explicit manner as establishing a reflection about the project, which is a key to identify learnings for the future.

Furthermore, no matter which definition of knowledge one adhere to it is clear that both project retrospectives and IT-systems possess potential to capture and disseminate information from projects in a more systematic manner, which could facilitate the application and creation of new knowledge. However, these measures are only part of the process and dependent of each other as several other elements and facilitators to be in place in order to have an effective learning process from projects. As the project retrospective effectively can raise awareness and capture learnings, they must be easy accessible and preferably searchable, which is where the IT-system plays a significant role to finally make them applicable to facilitate future learnings when this information are developed in a new social context. Finally, the aim with this process is to avoid repeating mistakes and hence be able to develop and optimize ones processes to sustain a competitive position in a competitive business market.

What this thesis have contributed with is to show that both IT-systems and project retrospectives theoretically could be useful tools when designing learning from experience systems. Still, they are only two pieces of a bigger puzzle, where all systems need customisation but still one should at least not forget the potential in these two tools.

7. Suggestions for further research

Focus in this research have mainly remained on working procedures. What is suggested to look further at is how a project retrospective should be designed to suit these specific business needs. In order to tie learnings more to the organisation it is also suggested to implement a similar decision support tool as used in the other groups of the project department but customized to suit the needs of the rebuilding group. Furthermore, in the project planning phase when calculating on projects there are a lot of numbers from where one can learn and update. This have not been investigated in this thesis but it is an important part from where one could learn and optimize a lot from experiences, which is why one should look closer to this in the future.

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