Effective knowledge sharing between team members

Case perspective of performance climate in project based organizations

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Abstract

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Background: Knowledge sharing between project teams has obtained significant attention in research. Despite wide attention, many organizations still experience difficulties of effective knowledge sharing between their project team members, and the problem still remains which appears to be contradictory. Previous research has had a tendency to assume that the knowledge sharing activity is affected by the performance climate as well as individuals, and often ends up with knowledge hiding behaviour under these circumstances. However, limited research has considered the relationship between knowledge sharing and performance in project based organizations, which is considered to be equally important for efficient knowledge sharing.

Purpose: The purpose of this study is to increase the understanding of the challenges concerning knowledge sharing specifically under performance climate within project teams. This thesis will explore the importance of hidden factors which can facilitate knowledge sharing in project based organization.

Methodology: This study is generally a single case study, based on qualitative and inductive research method. Empirical data has been obtained through a semi-structured interviews study with interviews with nine team members from different project teams in the same organization. Furthermore, literature has been studied in order to complement and increase the understanding of the information provided in the interviews.

Conclusion: Relying on our research, we concluded that performance climate has both positive and negative influence on knowledge sharing. It also depends on the management of the organization to design their knowledge sharing activities in such a way that the team
members will not be affected by the performance climate. However, socialization becomes vital to accomplish knowledge sharing activates and in order to perform this, time is one of the critical challenges in project based organization. The findings thus also demonstrate the existence of other challenges with knowledge sharing in project based organizations.

**Keywords:** Knowledge Sharing, performance climate, Project based organization
Effective knowledge sharing between team members-
Case perspective of performance climate in Project based organizations
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“If you have knowledge, let others light their candles in it.”

Margaret Fuller
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1. Introduction

Knowledge is the most important strategic resource in an organization and the management of this is considered to be crucial for the successful growth of organizations. The organizations who decide to capitalize their knowledge based resources must need to understand how to create, share and use this knowledge efficiently in their organizations. This research paper will analyse the influence of performance climate on knowledge sharing within project team members in a project based organization.

This first chapter begins with an introduction of the study on knowledge sharing and performance climate in a project based organization. This chapter is going to highlight the research problem and dilemma of this thesis, and the purpose of this study as well. Thereby, the research question will be demonstrated to the readers.

1.1 Background

Why do employees need to share their knowledge? Why don’t project team members share their knowledge? By which means does a project team member share their knowledge under different organizational conditions? What are the challenges for knowledge sharing in Project based organizations and how does this actually happen in practice? All these questions and similar questions are in the discourse of various researchers from the last few decades. Thus, for several years, researchers such as Ajmal (2008), Grant (1996a), Hobday (2000), Nonaka (1994), Takeushi (2001), Söderlund (2016), and Whitley (2006) have produced extensive material on these topics based on their different approach of analysis, observation and methods. This lead us to explore more about effective knowledge sharing within project teams in Project based organizations. To perform such analysis, in this thesis the authors decided to

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1 According to Oxford English Dictionary (2015), project is defined as “a collaborative enterprise, freq. Involving research or design, that is carefully planned to achieve a particular aim”, but the concept of project may differ depending on the types of small and large international activities in an organization.
understand the structure of Project based organization (PBO) specifically. The reason to choose this pragmatic path is that it allows us to be more inclusive in the review and to compare a variety of ways in which other authors presented their research. Although, projects are considered to be a key activity in several organizations, but they may vary due to a number of reasons such as geographical locations, nature of products, innovation culture, structure of project teams etc. (Söderlund, 2015). In Contrast, PBOs have a number of ongoing projects at the same time with several project team members from diverse background and moreover, they are constrained by the temporary nature of the project. (Hobday, 2000). Lindkvist (2004) describes PBOs as those companies that do most of their tasks in projects and their main emphasis lies on project dimensions rather than functional dimensions of organizational process and structures. However, according to these theories, it is easy to conclude that under PBOs, each team takes one project. This situation can lead to team members that have common priorities, motivations and goals (Kanbantool.com, 2017).

Conversely, the team based project structures leads to different priorities and levels of motivation, due to each team having several projects (ibid). Although the project context provides a new view for investigating knowledge (Sydow, Lindkvist and DeFillippi, 2004), the temporary nature of each project team makes it difficult to build up knowledge capabilities due to insufficient understanding of knowledge (Alvesson 2004). It is being noticed that the virtues of highly focused, fast and autonomous knowledge carried out in projects have their corresponding downsides. For example, focused knowledge would lead to insufficient care about things outside the project; fast knowledge means there is little time for reflection in the documentation; and autonomous knowledge implies that knowledge cannot be available for new team members who did not work in this project before (Sydow, Lindkvist and DeFillippi, 2004). Thus, enhancing knowledge capabilities needs to be prioritized in for team based structures, instead of effective knowledge sharing. However, for the PBOs, due to one team for one project, team members can keep the team aligned, obtain

---

2 Hobday (2000) describes them as a form of organizations, which tend to perform their everyday tasks and activities in the form of projects for production or innovation, and there is no formal functional coordination across the project lines
motivations easier and share a common goal. These benefits provide a good condition for knowledge sharing, and the requirement to effectively share knowledge also rises.

Thus the reason to analyse effective knowledge sharing in PBOs is to enhance the understanding about the mechanism by which more and more knowledge can stay inside the organization rather than dissolve with the completion of one project. According to Grant (1996a), individuals are the source of organizational knowledge and that is why the authors decided to focus on the minor level of knowledge sharing within project team members. Furthermore, in this thesis by using the phrase “word efficiency”, authors mean the speed and ease with which project team members can access and find valuable knowledge within their project team. Effective knowledge sharing can decrease the arising chances of error or rework because of communication between team members and time which is used to plan project execution. (Ajmal, 2009, Wiewiора, Trigunarsyah, Murphy and Chen, 2009).

In certain articles, knowledge sharing is described as a two-way communication process where two parties: the sender and receiver are in the process of learning new knowledge by the willingness and motivation of individuals (Ajmal and Koskinen, 2008; Alekseev, 2010a). Indeed, to put forward Takeuchi (2001), who shares that there are two kinds of knowledge; explicit\(^3\) and tacit\(^4\) knowledge. Since explicit knowledge is digital and can easily be captured in the database of libraries, it is accessible to individuals (Nonaka, 1994). Nonaka (1994) further defines tacit knowledge as an activity of continuously knowing and embodies what is referred to as an “analogue” quality. According to this context, communication between individuals is seen as an analogue process which aims to share tacit knowledge to build mutual understanding (ibid). Therefore, building mutual understanding between team members in PBOs becomes crucial to share tacit knowledge which exists in the form of past experiences or skills among individuals.

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\(^3\) Explicit knowledge is seen as the tip of the iceberg because it is already formalized and documented (Takeuchi, 2001)

\(^4\) Tacit knowledge is the part of the iceberg that is hidden under the surface, a knowledge that is not easy to detect and express (Takeuchi, 2001).
The past few decades, it has been demonstrated that the knowledge sharing process\textsuperscript{5} cannot take place in a vacuum and it is always rooted in the context\textsuperscript{6} where it is taking place (Nonaka, 1994; Sergeeva and Andreeva, 2016). In previous literature, many researchers such as Sergeeva and Andreeva, (2016), Cerne et al., (2013) and (Kang, 2015) have described the context in different approaches. However, in this research paper, context for knowledge sharing is specifically considered as performance climate, in which team members of one project team are assessed with respect to the performance of their co-workers from the same team. According to Kang, (2015), performance climate is the one component of organizational culture\textsuperscript{7} which can impact the behaviour of team members for knowledge sharing activities. In addition, Cerne et al., (2013) distinguishes two forms of climate: motivational and performance climate. Motivational climate helps the project team members share more knowledge and provide opportunities for sharing whereas performance climate generates negative issues like knowledge hiding or withholding knowledge among project team members(Cerne et al., 2013). Furthermore, performance climate establishes a sense of competition which ultimately decreases the cooperation\textsuperscript{8} among team members in the workplace (Pinto and Pinto, 1990). This is because competition between project team members can emphasize performance differences and typically rewards the individuals with high performance and sanctions on low performing individuals. Whereas, according to Beersma, B., Hollenbeck, J, Humphrey, S., Moon, H, Conlon, D., and Ilg, D (2003), competition among team members promotes the efficiency and innovation at work place because this behaviour can stimulate the individuals to perform faster or smarter than their co-workers (Beersma et al., 2003). In contrast, Allred, Snow and Miles, (1996) argue that the organizations perform

\textsuperscript{5} Bartol and Srivastava (2002) define process of knowledge sharing as an individual’s sharing organizationally relevant information, ideas, suggestions, and expertise with one another (Bartol and Srivastava, 2002).

\textsuperscript{6} Context is defined as situational opportunities and constraints that affect the meaning of organizational behaviours along with the functional relationship between variables (Sergeeva and Andreeva, 2016).

\textsuperscript{7} Organizational culture typically is defined as a complex set of values, beliefs, assumptions, and symbols that define the way in which a firm conducts its business (Barney, 1986).

\textsuperscript{8} Cooperation can be defined as positive correlation among team’s members in which individuals are willing to help and facilitate each other (Beersma et al., 2013).
better by establishing cooperation rather than competition. They further state that the minimization of the differences and distinctions (distinction based on performance) among project team members can trigger the efficiency of teamwork, knowledge sharing and helping behaviour (Allred, Snow and Miles 1996). However, it is challenging for PBOs to create cooperation among project team members with temporary project settings within a specific period of time.

Literature suggests that to establish successful cooperation among team members, communication and socialization is needed (Pinto and Pinto, 1990). Due to performance climate, team members focus on the accomplishment of their own task and do not spend time on socialization and communication which resulted in less knowledge sharing (Cerne et al., 2013). Borg and Söderlund (2013) argue that the individuals in PBOs are more likely to be responsible for making and shaping their own careers which increases the individualisation in PBOs. Another argument to put forward is that organizational climate which emphasizes individual performance may pose a significant barrier in knowledge sharing as compared to cooperative teams which are more likely to trust and help each other (Borg and Söderlund, 2013). Thus, the knowledge sharing activities get affected under these conditions and it becomes challenging for PBOs to establish effective knowledge sharing among team members in performance climate.

In previous literature, knowledge has been recognized as the most important source of competitive advantage in PBOs (Ipe, 2003). Followed by Ajmal (2009), Ajmal and Koskinen (2008) Hobday (2000) and Söderlund (2015), a project based organization is a form of organizations which involves in the creation of temporary systems for the performance of project tasks. Although time is one of the most valuable factors in PBOs to organize and coordinate their activities for successful completion of projects, it is still challenging for PBOs to balance between successfully meeting project deadlines and effective knowledge sharing at the same time under performance climate. Furthermore, PBOs have established the trend to integrate diverse and specialized intellectual resources into different project teams
(Ajmal and Koskinen, 2008). This is because, the project teams in these organizations consist of individuals with diverse skills and backgrounds working together for a very limited period of time. A common situation appears in PBOs that team members have never worked together in the past, and do not expect to work again in future (Söderlund, 2015). Thus the knowledge which is gained in one project can easily be misplaced, when the team members finish with one project and move on with others. Ajmal and Koskinen (2008) provide the evidence that the ability to manage what individuals know in PBOs is often constrained by the capability of valuing, creating, absorbing and sharing knowledge.

The above displayed literature points out the tense situation inside PBOs for knowledge sharing. Project team members require knowledge to be shared or to integrate different skills to achieve the goals. This means that assisting behaviour and the ability of socialization and communication are necessary for team members. However, due to the individualization (Borg and Söderlund, 2013) and the performance context (Cerne et al., 2013; Sergeeva and Andreeva, 2016), team members are more concerned about their own career instead of improving the whole organization. Under this situation, sharing knowledge or helping each other is decreasing, finally affecting the growth of the organization as a whole. Managing these two layers simultaneously seems to be a complex issue for PBOs.

1.2 Problematization and Dilemma

According to Ajmal (2008), knowledge sharing is seen as an important task, because PBOs often lack in effectively organizing knowledge, which is acquired in one project and transferred to other projects. As already mentioned above, this may happen due to a number of factors such as tight project deadlines, communication barriers, lack of common language, lack of technology and sense of individualization or different understanding of organizational goals etc (Söderlund, 2015; Wiewiora et. al, 2009). Besides these factors, the context also influences knowledge sharing in project teams. Cerne et al., (2013) discuss that the context in which employees are perform their everyday task plays an important role in their decisions to
hide or share knowledge. They further describe the climate conceptions and deem that performance climate emphasizes on normative criteria for success and establishes negative interdependencies between individuals. This results in less knowledge sharing or more knowledge hiding behaviours, and some individuals withhold or conceal knowledge that has been requested by another individual (Connelly et al., 2011). Literatures suggest that it happens because of the fear of individuals for losing their ideas and being dominated by coworkers (Sergeeva and Andreeva, 2016). It seems that the attitude towards knowledge sharing of team members would influence the knowledge sharing level. That attitude stems from the performance climate. Therefore, the performance climate affects the knowledge sharing behavior to a certain extent.

Furthermore, in PBOs, team members move quickly to other projects after completing one and focus on finishing their own task deadline (Cerne et al., 2013). Moreover, the recruitment of team members in these organizations is also dependent on their past performance and experiences, which also results in hindering knowledge sharing (ibid). For instance, some companies would prefer to hire those consultants which perform better in the past and have good experience of handling tight deadlines (Bredin and Soderlund, 2011). Thus, to achieve deadline targets, team members spend less time on communication and socialization which results in a less knowledge sharing behaviour (Pinto and Pinto, 1990).
Less knowledge sharing would result in a change in the team member’s sharing perception. This sharing perception influences their behaviour in social exchange situations, according to Janssen and Van Yperen (2004) and Poortvliet and Giebels (2012). Meanwhile, researchers such as Sergeeva and Andreeva (2016) argue that human activity is based on knowledge sharing, and most organizations are knowledge sharing based, differing on the nature, type of agents and purpose of knowledge sharing. Other literatures suggest that the knowledge sharing process always embeds in the context in which it occurs (Cerne et al., 2013; Sergeeva and Andreeva, 2016). Thus, the knowledge sharing process exists in performance climate as well. However, there is seldom literatures about how knowledge sharing impacts performance climate. Therefore, the real relationship between performance climate and knowledge sharing in PBOs has not been explored yet. This study addresses the gap which exists in theory and explores the relationship between the performance climate and knowledge sharing in PBOs.

To understand the relationship between PBOs, performance climate and knowledge sharing, the authors of this thesis will analyze the case study of a high technology Swedish company, Zemax (see chapter 3.3). This company is a typical performance climate as according to their line manager, they have a performance assessment every three weeks. Seeking the balance between knowledge sharing and their own climate is always a goal for their management. This research has also given enough time and scope to gain initial in-depth information with
great respect to those employees. With the help of a semi-structured interview, a case study is going to be conducted, which will form the analysis method (see chapter 3.2). All interviews are conducted within teams, because communication and decision making tends to happen fast and fairly, which means a high level of knowledge sharing is required inside teams. Meanwhile, team members who work under PBOs will feel an insecure in their climate, leading to some uncertainties for knowledge sharing (see chapter 1.1). Thus, this research is going to take interviews within project teams, and aims to find an empirical result and to extend existing theories in this field by coming up with a model to show real relationships.

### 1.3 Aim of study and Research question

As mentioned before, the PBOs organize most of their activities in project settings where the purpose of creating teams is to bring individuals with different backgrounds together and to utilize their skills and knowledge efficiently to accomplish desired goals. If these individuals do not share their knowledge among other team members, in the end, organizations will not be able to establish knowledge as a source of competitive advantage which can stay in organizations. Moreover, the knowledge sharing processes becomes even more complicated when it comes to performance climate in PBOs, where team members are even more reserved when it comes to knowledge sharing. Thus, the aim of this research paper is to stretch the understanding of knowledge sharing even further, and to analyze the influence of performance climate on knowledge sharing in PBOs (Sergeeva and Andreeva, 2016). Furthermore, Sergeeva and Andreeva (2016) divide people who share knowledge as mid-level professionals, managers, members of online communities, knowledge workers and so on. This study focuses on employees who work inside a project teams and exclusive team managers. However, team managers are also interviewed to get information about the organization and climate only.

The study aims to contribute to literature about employees for knowledge sharing under performance climate in PBOs, and to figure out the positive factors which can enhance
knowledge sharing behaviour of individuals. Previous and current research on knowledge sharing from a particular perspective of project work context is of a very preliminary level. However, a deeper understanding needs to be established to properly manage and utilize knowledge in PBOs, as it is essential for competitiveness of future projects (Ajmal, 2008). For this purpose, the study applies theoretical and empirical evidence in examining the research question and established interest to identify the following question:

**How does the performance climate influence knowledge share inside PBOs?**

By justifying the purpose of this study, it is essential to extend further understanding of individual behaviour, whereby people can share knowledge within specific settings and if they seek to react efficiently to the challenges and opportunities of social operating environment. Specifically, projects and projects teams are playing the important role for knowledge sharing in an organization. Thus, there is a requirement of better understanding knowledge sharing within projects teams from a performance based perspective.
2. Theoretical Background

This chapter is built upon literature review of existing research. Firstly, it will highlight the theme of knowledge sharing by approaching it with regard to existing study. Authors will also develop theoretical definitions to understand the basic concept which is needed to answer our research question. Secondly, research will discuss how knowledge sharing can be used in Project based organizations especially in project team members. Thirdly, we examine how knowledge sharing can be influenced in Project based organization specifically when it comes under performance climate. Finally, the challenges for knowledge sharing in Project based organization under performance climate have been identified.

2.1 Knowledge Sharing

Knowledge has becoming an interesting area for organizations and a source of competitive advantage which is addressed by many authors in literature such as Ajmal (2008), Eisenhardt and Santos (2002), and Grant (1991). Nonaka (1991) states in his article that: “In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge” (Nonaka 1991, p.91). According to Alekseev(2010a), knowledge resides in the human brains and it involves the experiences of individuals’ personal beliefs, which influence the judgment process or decision making power of this individual.

In current literature, many authors give a number of definitions for knowledge sharing such as Beveren (2002), King, Chung and Haney (2008) and Liyanage et al, (2009). Some authors consider knowledge transfer and sharing as the same concept, whereas others consider it to be two different concepts. According to King, Chung and Haney (2008), knowledge transfer consists of a more structured way of communication as compared to knowledge sharing. Moreover, knowledge transfer involves direct interaction between the sender and receiver.
(knowledge recipients) and the process between these is more purposeful and focused. In contrast, knowledge sharing is less focused and based on techniques of indirect communication. Liyanage et al (2009) classified between knowledge transfer and knowledge sharing as follows: they describe knowledge transfer as a one-way process of exchanging a different piece of knowledge, while knowledge sharing is a two communication process where all parties are in the process of sharing and learning new things.

Figure 2: Knowledge sharing with respect to knowledge Transfer

Nature of knowledge

Ipe (2003) points out that the nature of knowledge has a significant influence over how knowledge is shared within organizations, and it exists in both tacit and explicit forms. However, Polanyi (1964) initially asserts that tacitness and explicitness are two dimensions of knowledge. Following the lead of Polanyi, the literature on nature of knowledge has focused on these two types of knowledge, such as Chilton and Bloodgood (2007), Choo (2000), Howlett (2010), Smith (2001) and Thomas and Brown (2011). Table 3 describes some specific characteristics of both explicit and tacit knowledge.
With a clear boundary drawing between tacit and explicit knowledge, which kind of knowledge is more important has become a general topic. Koskinen (2000) highlights in his article that although the explicit knowledge is more easy to organize and manage, it is still important to emphasize on better management of tacit knowledge in project environment for better achievements. However, knowledge is not static and isolated therefore, it keeps transforming from one type to another during process of sharing (Alekseev, 2010a). Nonaka, Toyama and Konno (2000) discuss the SECI model for knowledge conversion which is based on four modes of transformation.

**Figure 3: SECI Model**

![SECI Model](image)

Source: *(Nonaka, Toyama and Konno 2000, p. 12) (Revised by authors)*
**Socialization:** This section transforms tacit to tacit conversation. Socialization plays the role of joint activities when individuals spend time together and share the same working environment. In the socialization process, tacit to tacit knowledge transfer occurs by observing the actions and activities of colleagues and then by the imitating and practicing those activities.

**Externalization:** This emphasis on tacit to explicit knowledge conversion. In this process tacit knowledge become articulated and therefore transfers into the form of explicit knowledge. For example, to improve the business process by formulating ideas via understanding of shortages of current process (Nonaka, Toyama and konno, 2000).

**Combination:** Combination comprises of explicit to explicit knowledge conversion. For example, complication of financial report which is based on collection and processing of different information from multiple sources in an organization. Combination involves different types of communication such as meetings, virtual networks and documentation etc.

**Internalization:** It transforms explicit knowledge into tacit knowledge. This process is considered as learning by doing. Individuals internalize the obtained explicit knowledge according to their perceptions and understandings.

### 2.2 Role of knowledge sharing in Project Based Organization

As discussed above, the management of tacit knowledge in knowledge sharing helps organizations get better achievement, especially the socialization process. Nowadays, the major business endeavour for reaching higher levels is the project. Through projects, organizations can respond by changing flexibly, thus more and more project based
organizations appears (Boh, 2007). This part will introduce the real role of knowledge sharing inside PBOs.

2.2.1 Project Based Organizations

In the modern era, according to Midler (1995) and Keegan and Turner (2002), taking projects as a part of business operations is a common phenomenon for those firms which are in different types of industries. PBOs are greatly favored settings to perform hi-tech engineering task and solve complex problems in interdisciplinary teams. They are described by various scholars such as Lundin and Söderholm in 1995, and later by DeFillippi in 2002. Based on them, PBOs are considered as a variety of organizational forms which include the creation of temporary systems for the performance of project tasks. Based on Galbraith (1971, 1973), who points out the difference between PBOs and other types of organization, Hobday (2000) illustrates how organizations change from pure functional organizations to pure PBOs, showed as below:

Based on Galbraith (1971, 1973), who points out the different between PBOs and other types of organization, Hobday (2000) illustrates how organizations change from pure functional organizations to pure PBOs, showed as below:
Meanwhile, Hobday (2000) points to some organizations as project-led organizations and distinguishes them from PBOs, which organize most of their internal and external activities in projects. Later, Lindkvist (2004) refers to some PBOs which have a main emphasis on the project dimensions rather than the functional dimensions of organizational structure and processes. This emphasis further completes the types of PBOs. After Lindkvist (2004), Whitley (2006) develops four patterns of PBOs, based on Singularity of goals and output, and Separation and stability of work roles. Based on two variables, those four different types are organizational, craft, precarious, and hollow. Figure 4 gives an indication.

### Table 2: Positioning the Project Based Organization.

<table>
<thead>
<tr>
<th>The type of organization</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional Matrix</td>
<td>Project manager is confined to coordinating resources, monitoring progress, and reporting into one or more functional managers.</td>
</tr>
<tr>
<td>Functionally-oriented matrix</td>
<td>It is run as a functional matrix with lightweight project managers.</td>
</tr>
<tr>
<td>Balanced Matrix</td>
<td>Responsibilities and authority for each project are shared between functional and project managers.</td>
</tr>
<tr>
<td>Product/project Matrix</td>
<td>Project manager has authority over personnel, finance, and other resources.</td>
</tr>
<tr>
<td>Project-led organization</td>
<td>The needs of projects outweigh the functional influence on decision-making and representation to senior managers, but some coordination across project lines occurs.</td>
</tr>
<tr>
<td>Pure project based organizations</td>
<td>It has been organized along project-based lines, with project managers in direct control of project resources, team-building, and project outcomes.</td>
</tr>
</tbody>
</table>

Figure 4: Types of Project Based Firms

Furthermore, Söderlund (2015) describes the uniqueness of goals, adding the production of risky and unusual outputs to define Project Based Organizations:

“the organizational project-based firm with comparatively repetitive projects and low separation and stability of work roles; the craft project-based firm with related projects and distinct and stable work roles; the precarious project-based firm with unique projects and varied and changeable skills and roles; and the hollow project-based firm, which produces unique projects but relies on standardized, separate, and stable work roles.”

(Söderlund, 2015, p85)

Due to the variety of types, PBOs are used in a wide range of industries. High technology (e.g. software, computer hardware, multimedia) is one of them. For this industry, PBO is an ideal form which is suited for the management of increasing product complexity, high-speed changing in customer focus markets, and technological uncertainty (Hobday, 2000). All these requirements are applied and underpinned to valued and sophisticated high technology companies, which are used to cope with emerging properties and to meet the changing requirements in the business operations (Hobday, 2000).

Loch and Kavadias (2007) explain why PBOs are the best choice for high-tech companies in the underlying level. High-tech companies need to develop different products at the same time, because of the prerequisite of new products to survive in a strongly competitive and dynamically changing market (Verma and Sinha, 2002). This situation asks for defining and creating a cohesive product or service (Loch and Kavadias, 2007). This goal leads to fast decision-making, which ensures rich communication in order to concentrate on the product and market, just as Loch and Kavadias (2007) said in Chapter 3, “...a high external integration with the market, a rich focus on the timeline and the overall profitability of the project are the strength of the project organization” (Loch and Kavadias, 2007, p170).
2.2.2 Challenges for knowledge sharing in PBOs

According to Ruuska and Vartiainen (2005), there are two types of challenges in knowledge sharing that often arise in PBOs which are:

- Firstly, how to prevent the “reinvention of the wheel” and to share knowledge accumulated in project with others.
- Secondly, how to improve the communication between project team members who work in dispersed projects, which could increase knowledge sharing at the same time isolate people from peers.

In order to understand how challenges, meet with PBOs, it is interesting to understand how those challenges occur. The projects are temporary, which means that the employees do not reflect on past experience when moving on to the next project, after the closure of the old one (Lindner and Wald, 2010). Due to this typical feature, empowered employees (who have knowledge in their own mind) with information decentralization (lower level employees operate on local information) lead to reinforce knowledge fragmentation inside PBOs (Kasvi et. al., 2003). Project team members may not be too motivated to share their knowledge because of the knowledge fragmentation (Kasvi et. al., 2003).

On the contrary, it is not that sufficient for PBOs to acquire knowledge just via staffing and training; they need to make efficient use of the already existing knowledge-based resources, which means they should share knowledge efficiently (Wang and Noe, 2010; Foss et. al., 2009). Meanwhile, some team members do not expect to work with people who have never worked together (Ajmal & Koskinen, 2008), and do not communicate with them. Therefore, on the one hand, it becomes essential that project team member share their knowledge with each other, but on the other hand, it is harder to let them to do so.
2.2.3 Factors influencing knowledge sharing in PBOs

According to existing studies, researchers tried to address the challenges of knowledge sharing inside PBOs. There are different views on the solution of these challenges. Matzler et al. (2008), Cabrera and Cabrera (2002) and Spender (1996) find that the properties of knowledge were the key factors, as well as different types of knowledge (Boh, 2007; Chai et. al., 2003; Landaeta, 2008; Geisler, 2007). However, the factors that may have influence on knowledge sharing are not only on knowledge itself, but also technology (Davenport et al., 1998; Connelly and Kelloway, 2003; Yeh et al, 2006), organizational culture (Ajmal and Koskinen, 2008; Ajmal, Kekäle and Takala, 2009; Ajmal and Helo, 2010) and leadership (Ryan and Prybutok, 2001; Moffett et al., 2003). In this section, the main factors to be introduced are time, opportunity to share and motivation to share.

- **Time**

Knowledge sharing at the project level takes place as a social communication (Arenius, Artto, Lahti, and Meklin 2003). The communication provides a crucial link among people, ideas and information which are necessary for project success under the project environment (Project Management Institute 2004). Tight schedules reduce the amount of social communication taking place during projects, which means knowledge sharing is reduced. The tight schedule is also a component of time, according to Schreiber and Gutek (1987). Thus, time has a close link with knowledge sharing.

An overview of the understanding of time in project work is reflected by existing literature, such as Ajmal and Koskinen (2008), Eskerod and Skriver (2007), Keegan and Turner (2001), Newell et al. (2006), Schindler and Eppler (2003) and Turner et al. (2000). They all deem that time has a strong relationship with knowledge sharing inside PBOs. The fact that projects don’t often last for long periods, means that the project team members continuously change their knowledge (Koskinen, Pihlanto and Vanharanta, 2003). Time is perceived to be limited, project members are focused on delivery of the product or service rather than on knowledge
transfer activities. This results in lacking communication that project knowledge is captured and shared infrequently.

Santos, Soares and Carvalho (2012) analyze why time influences knowledge sharing in PBOs even further. They point out that because the projects are purposeful well-defined time limitation activities, the organizational memory of a project is what lasts for the duration of the project. Project members will rely on organizational memories, and knowledge sharing is a good way to extend organizational memories. Therefore, the short organizational memories result to the critical role of knowledge sharing (Davidson and Voss, 2002).

- **Opportunities to share knowledge**
  According to Ipe (2003), opportunities to share knowledge in organizations can be both formal and informal in nature. Bartol and Srivastava (2002) and Rulke, Zaheer, and Anderson (2000) define the formal opportunities as purposive learning channels, which are designed to explicitly acquire and disseminate knowledge. In order to facilitate knowledge sharing, formal opportunities include training programs, structured work teams, and technology-based systems. On the other hand, Rulke, Zaheer, and Anderson (2000) call informal opportunities as “relational learning channels”, which use personal relationships and social networks to encourage knowledge sharing inside organizations (Brown and Duguid, 1991; Nahapiet and Ghoshal, 1998).

Although both formal and informal opportunities play a part in facilitating knowledge sharing, Jones and Jordan (1998), Pan and Scarbrough (1999) and Truran (1998) indicate that the most amount of knowledge is shared in informal settings. This aims that knowledge sharing depends more on personal relationship and social networks. Furthermore, Stevenson and Gilly (1991) find that individuals tend to rely more on informal relationships for communication, even for clearly designated channels of knowledge sharing existing in organizations. Thus, combining these views indicates that employees prefer to share knowledge in an informal way, and seek more informal opportunities to share knowledge.
Even in PBOs where people work under pressure and often have no time for social communication, the opportunities to share is still a main factor to influence knowledge sharing. Boh and Yellin (2006) have analyzed how to provide the opportunity to increase the probability of knowledge sharing in PBOs. If they wish to increase knowledge sharing, they can create more informal opportunities for team members to share knowledge, instead of simply depending on individuals to “pull” knowledge from the right sources (Boh and Yellin, 2006).

- **Motivation to share**

  People are not likely to share knowledge without strong personal motivation (Stenmark, 2001). Hence, several studies have moved to motivational factors which influences knowledge sharing. According to Ipe (2003), the factor of motivation that influence knowledge sharing is divided into internal and external factors. In the words of Ipe the internal factors “include the perceived power attached to the knowledge and the reciprocity that results from sharing.” (Ipe, 2003, p345), and the external factors “include relationship with the recipient and rewards for sharing.” (Ipe, 2003, p346).

  Power and reciprocity are related to internal factors and in turns influences knowledge sharing. Reciprocity supporting knowledge sharing is discovered by Dyer and Nobeoka (2000). Empirical evidence from Bartol and Srivastava (2002) explain reciprocity motivates knowledge sharing, enhancing participants’ expertise and providing opportunities for recognition. Likewise, Weiss (1999) finds that power is an important aspect of knowledge sharing in organizations. In the term of power, it has an opposite relationship with knowledge sharing, compared to reciprocity. Gupta and Govindarajan (2000) describes that if individuals perceive that power comes from the knowledge they possess; it is unwillingness to conduct knowledge sharing inside organizational.
External factors contain the relationship with recipient and rewards for sharing (Ipe, 2003). The recipients influence knowledge sharing through trust and the power and status of the recipient. Academics such as Allen and Cohen (1969), Barnlund and Harland (1963) and Huemer, von Krogh, and Roos (1998) have already proven it. In addition, for the rewards factor, O’Dell and Grayson (1998) and McDermott and O’Dell (2001) claim that different types of rewards (such as formal and informal, tangible and intangible) influence knowledge sharing in organization. Furthermore, Bartol and Srivastava (2002) propose a relationship between four different mechanisms of knowledge sharing and reward systems.

In other words, internal and external factors are both required to motivate knowledge sharing in organizations. With PBOs widespread, the motivation to share in PBOs has been widely argued in literatures. Agrawal, Mohammed and Thatte (2011) reveal that if employees are not motivated sharing knowledge, the quick deployment of employees and collective knowledge to various projects of organization would be influenced. Meanwhile, several factors have been found that may motivate knowledge sharing inside PBOs, for example, enhancing status and reputation (Wasko and Faraj, 2005), developing nurturing relationships (Ko, Kirsh, and King, 2005), improving employee's behaviors (Bock et al., 2005), incentives (Bartol and Srivastava, 2002), fairness (Bouty, 2002), psychological contract maintenance (Scarborough and Carter, 2000), and knowledge sharing climate (Connelly and Kelloway, 2003; Jarvenpaa and Staples, 2001).

### 2.3 Relation of knowledge sharing with performance climate

Achieving efficient knowledge sharing is based on organizational context and individual characteristics rather than other factors (Cabrera and Cabrera, 2002; Wang and Noe, 2010). Sergeeva and Andreeva (2016) summarize 51 articles on knowledge sharing which has reported data from multiple different organizational contexts to demonstrate the importance of organizational context in existing researches. Perry-Smith (2006) and Perry-Smith and
Shalley (2003) emphasize the importance of creating favorable work environments in knowledge sharing as well. The performance climate would also be considered as one organizational context, because it enables organizations to take corrective and preventive actions, although it could lead to even worse scenarios in knowledge sharing (Cerne et al., 2013).

Under performance climate, project team members generally believe that only the best achievers are acknowledged as successful inside the organizations, and are overwhelmed with comparative information (Ames, 1984; Levine, 1983). They might become less willing to share this knowledge because of the fear of being evaluated and losing their power and status (Husted and Michailova, 2002). This tendency intensifies the challenges for knowledge sharing, because in this kind of environment, employees are willing to hide knowledge to gain a competitive edge or a better chance of winning (Cerne et al., 2013). Connelly et al. (2011) has already synthesized those existing studies in order to prove that the knowledge hiding has a negative impact on knowledge sharing. In other word, the challenges for knowledge sharing are further embodied in knowledge hiding inside project based organizations. This will be discussed later.

In order to clearly understand the challenges that are faced by knowledge sharing inside PBOs, more researchers focus on performance climate area. Firstly, Ames (1992a), Ames (1992b) and Nicholls (1989) demonstrate the conception of performance climate: criteria for success and failure in a work environment have been conceptualized as constituting that environment’s perceived motivational climate. Based on this conception, the performance climate is defined that the motivational climate characterized by social comparison and intra team competition (Cerne et al., 2013). Furthermore, performance climate is defined as environment in an organization where individuals are analyzed and assessed on the basis of their work performance with respect to their coworkers (Sergeeva and Andreeva, 2016).
Due to the fact that performance climate emphasizes normative criteria for success (Nicholls, 1989), the intra team competition are highlighted. Therefore, only those who are the best achievers are acknowledged as successful (Ames, 1984). A negative interdependence among employees has been developed, because performing better than co-workers is their goal (Ames and Ames, 1984). It is common for employees to be unwilling to share their knowledge in many instances, even organizational practices are designed to facilitate transfer (Connelly, Zweig, Webster and Trougakos, 2012).

Hence, the relationship between performance climate and knowledge sharing is heavily discussed by Amabile (1997), Beersma et al. (2003) and Perry-Smith (2006). They indicate that knowledge hiding is the influenced factor for knowledge sharing under performance climate. Employees must be motivated to share their knowledge to eliminate the influence of knowledge hiding in performance climate (Perry-Smith, 2006; Amabile, 1997). This because that the success in the performance climate often evaluate via social comparison, which may give team members to hide their knowledge for better chances of winning (Cerne et al., 2013). Therefore, in performance climate team members protect their own performance by withholding the knowledge from other team members. This knowledge hiding behavior affect the knowledge sharing activities in project teams and create inefficiency in communication. By withholding knowledge, team members try to increase their own value in front of management and only focus on their own career rather than team performance as a whole.

Cerne et al. (2013) likewise stress the role of performance climate of knowledge sharing through project team level. Project team members who work under performance climate feel safer from knowledge hiding, because co-workers will not be able to discover and to exploit his or her weaknesses. Hiding their own knowledge also can gain personal positive advantage.

Cerne et al. (2013) also explain that a decreased level of knowledge sharing lessens people’s ability to evaluate their value to the group. As knowledge sharing are less likely to be supported in performance climate, such a climate can increase the initiation for knowledge
hiding, due to the social comparison. However, a social exchange relationship between team members facilitates knowledge sharing (Wang and Noe, 2010). The comparison prevents the social exchange relationship, finally impeding knowledge sharing. In addition, such a relationship also influences the ability to generate, validate, and determine the appropriateness between members, which also contribute by Perry-Smith and Shalley (2003) and Wang and Noe (2010).

Finally, in order to understand those theories more clearly, there is a table listing principle past studies of knowledge sharing, performance climate and project based organizations which are used in the theoretical background see appendix 2.
3. Methodology

This chapter is about the methodological approach which is going to be used in the study. Methodology is based on subheadings research strategy, interview guide development and design which elaborate the research survey, interviews question and the content more specifically. This chapter ends with the description of data collection and analysis process such as sampling and gathering information about the specific company. The method of this research is a single case study. This is because the principle of indicating knowledge sharing is executed in a company, which is a PBO under performance climate that changes the recruitment process in bringing in its employees. To conduct this research, the case perspective and its uniqueness will be discussed below. In addition, explaining the chosen research design and method are the aim of this section, and then the research quality is evaluated to indicate the validity of carrying out this study.

Following Figure 5 demonstrates the overall study design which is used to conduct research. As visualization states that the first step of the research is to start with theoretical review of existing literature. The second step is to decide the company and develop data collection. Thirdly, it is to conduct the case study in the selected company. The fourth step is to analyse the case finding with respect to theory which is followed in the fifth step of discussion.

Figure 5: Study Design
3.1 Case perspective

The chosen company Zemax is aiming to know whether the knowledge sharing operate successfully, and to set more appropriate knowledge sharing strategies for project team members. This is because Zemax is an independent technology consulting company, in which a high requirement of knowledge sharing exists. This technology company is a project based organization in which the decision making speed is high. Due to task complexity and security reason, this organization tries to solve errors as soon as they can. Some of the employees complain that there is no space for the mistake, and they are under pressure to make decisions in quickly.

The software department is one typical department in Zemax which faces the pressure of making quick decisions. All data and information in this department are highly risky and confidential, and are required to be dealt within a short amount of time. Therefore, a very high risk of failure exists in this department. This pressure of making decisions quickly, coupled with perceived high risks of failure, will lead employees to share knowledge more readily and openly. Meanwhile, each project team includes team members with different knowledge levels, which provides a favorable internal environment inside the project team. This is because theory suggests that climate in the workplace has tight links with efficient knowledge sharing. That is why project teams from software departments are chosen to investigate.

In order to ensure effective knowledge sharing, companies consider that the influence of performance climate is important for knowledge sharing in project team level. Hence, impaction of the performance climate on knowledge sharing in project team is an essential requirement needed to achieve effective knowledge sharing for the whole company. For this purpose, an investigation for project teams has been set to start.
• **Case uniqueness**

The uniqueness of this study derives from two perspectives: macro and micro. Through a macro level, this case is unique due to the single case study, revealing the relationship of knowledge sharing in performance climate. Although knowledge sharing is impacted by performance climate, several scholars have already proved it. Figuring out the way of impaction and impacting factor would still have a unique possibility to bring an improvement on the field of knowledge sharing academic area.

On a micro level, the study explores knowledge sharing under performance climate amongst project teams. Having this research allows building a deeper understanding with the primary focus on the details of this situation. This shows that there are possibilities to gain results by only relying on interpretations of empirical data. Meanwhile, due to the characteristics of Zemax, the common influence between knowledge sharing and performance climate stemmed from previous research might be different. Zemax’s own features would also influence it.

**3.2 Research design**

This study utilizes the single study approach to investigate the research question. Under this research design, semi-structured interviews attempt to accumulate the existing information and data regarding how performance climate influence knowledge sharing in PBOs. The information revealed by interviewees is disclosed as well.

The purpose of this study is to analyze and understand the influence of performance climate on knowledge sharing within project teams, with the help of a case study of a real company. Authors collect the data inside the company, which allows researchers to gain more useful information to investigate.
In order to support research on Zemax, a case study is adopted. According to Saunders et al. (2007), a case study is an exploration of the research topic and phenomenon through context. Yin (2009) points out the four considerations for case study:

“(a) the focus of the study is to answer “how” and “why” questions; (b) you cannot manipulate the behavior of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context.” (Yin, 2009, p2)

In this study, the “how” question is going to be answered. The involvement behavior cannot be manipulated by researchers, and researchers cover all contextual conditions, the boundaries of which are hard to define. Since this research deals with a single subject, a single case study design has been chosen for conducting this thesis. The phenomenon of this study comes from exploring project teams, which have knowledge sharing practice in their daily work.

3.2.1 Single case study

The single case study is one of case categorizing in Yin (2009), which is considered as a common case design. It has an advantage which cannot be ignored: this kind of study is economical for all resources, especially for the inherently costly and complex collective people (Eckstein, 1975). The various forms of single case study can fit the numerous qualitative and quantitative research methods (Will, 2014), which is unrestricted for the researchers.

One of the rationales of single case study is the revelatory case, which means the researchers have opportunities to detect and analyze a phenomenon previously inaccessible to social
science inquiry (Yin, 2009). Since the chosen company has not previously been investigated in a performance climate, the opportunity to study this phenomenon sets the grounds for developing a revelatory case study. Hence, there is a possibility to view the single case study as a revelatory case.

This can be directly practical to the field of knowledge sharing in the environment of performance climate, mentioned by Connelly et al. (2011) and Sergeeva and Andreeva (2016). Since the research question is intent on exploring the real relationship between knowledge sharing and performance climate under PBOs, the chosen company has been defined as case subjects which has performance climate, while the project team members are embedded in play a crucial role in understanding the context of knowledge sharing.

Although exploring only one company might not provide sufficient empirical data to generate a new theory, which shows that single case study has its own notable advantage compared to other research design. Single case study can create high quality results because the data in single case study is not superficial and depth enough (Dyer and Wilkison, 1991). This study can still contribute to building an understanding of the research question. Besides that, since this study is aiming to understand a certain phenomenon existing, not to finding a more robust base for building theory, the single case study approach is more suitable for this research, according to Eisenhardt and Graebner (2007).

Most understanding of researches comes from the existing theories and from the interpretation of how theories work in the chosen field. Adapting interpretation theories in case practice reveals the qualitative nature of study, because qualitative focuses on words, instead of quantification in the analysis of data (Bryman and Bell, 2007). This will be discussed in the next part.
3.2.2 Semi-structured interviews

Semi-structured interview is a research method which belongs to qualitative research (Saunders, Lewis and Thornhill 2007), which will be discussed in detail in the Research Method section. This kind of interview has a list of questions on some specific topics to be covered, often referred to as an interview guide, but provides a great deal for interviewees in how to reply (Bryman and Bell 2007). It is an effective way to collect empirical data as well. Firstly, it enables that all the questions will be asked, and similar wording could be used from interviewer to interviewee. Due to its flexible structure, it also helps interviewees to address more specific issues for the relationship between knowledge sharing and performance climate, and to give the interview more structure (Bryman and Bell 2007). In addition, the interviewees are provided an opportunity to express themselves enthusiastically, which results in being able to collect detailed and rich data, including data that interviews may not have previously thought about (Saunders et al 2007).

In this research, 9 project team members are going to be interviewed to avoid similarities and maximize the variations. One of them is a project manager who focuses on providing information about organization and climate. These interviewees are picked from the software development department of Zemax. More introduction about data collection is going to introduce in 3.4.1.

All the data collected through interviews is transcribed and coded using Microsoft Word and Excel. Due to the chosen company wanting to stay anonymous and confidential, all the names of the interviewees were depersonalized, coded and numbered abbreviating their position in the company. Finally, the results were consolidated and placed in a table.
This table lists basic information of interviewees who took part in the research. The table also shows the coding based on abbreviation of interviewees’ positions in the company, which allows understanding for the interviewees background.

**Table 3: Position of the different interviewees**

<table>
<thead>
<tr>
<th>SERIAL NUMBER</th>
<th>POSITION</th>
<th>ABBREVIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee 1</td>
<td>Team Member</td>
<td>TM1</td>
</tr>
<tr>
<td>Interviewee 2</td>
<td>Team Member</td>
<td>TM2</td>
</tr>
<tr>
<td>Interviewee 3</td>
<td>Team Member</td>
<td>TM3</td>
</tr>
<tr>
<td>Interviewee 4</td>
<td>Team Member</td>
<td>TM4</td>
</tr>
<tr>
<td>Interviewee 5</td>
<td>Team Member</td>
<td>TM5</td>
</tr>
<tr>
<td>Interviewee 6</td>
<td>Project Manager and Team member</td>
<td>PM6</td>
</tr>
<tr>
<td>Interviewee 7</td>
<td>Team Member</td>
<td>TM7</td>
</tr>
<tr>
<td>Interviewee 8</td>
<td>Team Member</td>
<td>TM8</td>
</tr>
<tr>
<td>Interviewee 9</td>
<td>Team Member</td>
<td>TM9</td>
</tr>
</tbody>
</table>

The figure 6 demonstrates the professional experience of the nine interviewees. According to the interview data, professional experience has a large span: the shortest working experience is just 3 months, but the longest working years is over 40 years.
3.3 Research method

According to Bryman and Bell (2007), the case study research method stands for a generalization of new theories. In this research, the qualitative and inductive method are taken to find new theories and phenomena. More details about the method will be discussed below.

3.3.1 Qualitative approach

In this case, it provides a profounder understanding of the knowledge sharing process, especially under a performance climate amongst project teams. Most of information and data come from the interpretation of existing theories of knowledge sharing, and from the interpretation of how it works in the chosen field of practice. The attempt to interpret the theories in adapting them to the case practice reveals the qualitative nature of our study. According to Creswell (2003), qualitative research utilizes data collection and analysis methods that are specifically designed for non-numeric data. In contrast, quantitative research as is that deals with numeric data, which means utilizing data collection and analysis methods
that are either using or producing numerical data (Creswell 2003). Therefore, following the focus on knowledge sharing of project teams, in regard to the uniqueness of the case, this paper will be based on qualitative study methods in order to reach a deeper understanding of knowledge sharing in the project team.

3.3.2 Inductive approach

A second typology of research approach according to Saunders et al (2007) is deductive and inductive approaches to research (Saunders et al 2007). Deductive types of research are mostly applied to research areas in which predefined theories are available (Saunders et al, 2007). However, inductive research follows the reverse logic of deductive approach. Inductive research aims to generate theories on the basis of particular facts through investigation by several research types (Greener, 2008). The details about these two approaches are available in the table below:

Table 5: Deductive and inductive research

<table>
<thead>
<tr>
<th>Deductive research</th>
<th>Inductive research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving from theories to data</td>
<td>Driven general from specific</td>
</tr>
<tr>
<td>Collection of quantitative data</td>
<td>More flexible structure</td>
</tr>
<tr>
<td>Moving for general to specific</td>
<td>Collection qualitative data</td>
</tr>
<tr>
<td>Highly structured</td>
<td>Small numbers of samples</td>
</tr>
<tr>
<td>Large numbers of samples</td>
<td>Researcher is part of research</td>
</tr>
<tr>
<td>The independence of researcher</td>
<td></td>
</tr>
</tbody>
</table>

Zemax has its own characteristic, which has been mentioned in the beginning of this Chapter. Thus, conclusions from previous researchers might not be appropriate for this company. More specifically, the relationship for knowledge sharing under performance climate is drawn based on empirical quality interview, which goes in line with the procedures in an inductive research approach (Saunders et al. 2007). Inductive approach could be the suitable one for verifying and generating theories under this particular situation.

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This research starts with data collection to generate a new theoretical insight, and then draws a general conclusion about the relationship between knowledge sharing and performance climate from the empirical field work. The attempt to create theories in conclusion from case practice reveals the inductive nature of this study. In addition, according to Bryman and Bell (2007), qualitative research features an inductive study approach, generation of theory, interpretivism and constructionism. Based on the discussion above, this research will be mainly qualitative and inductive approach.

3.4 Research process

There are some different steps to conduct and implement this research. The first step is to design the study. For this purpose, finding the suitable methods and choosing the direction has started since February. In the meantime, literature which supports the study was being searched for and reviewed. Building a framework of methodology which could permit developing the argumentations is the main aim in this stage. Then, the next phase of this thesis was data collection. Since the middle of March, 9 interviews of project team members have been conducted. These interviews have brought a sufficient amount of empirical data for the empirical case study. After collecting all empirical data, the third step starts, which sustains from the end of March until the beginning of May. In this step, both theoretical data and empirical data have been analyzed, which include transcribing and coding interview data, making theories relevant to the finding and so on. The first draft of thesis is completed in this phase. The last phase of this study was the completion phase, which starts from the second week of May to the end of May. This is the reviewing and re-writing phase. During this step, the plan is to continue working in more details in the discussion and finding further research in order to provide a highly precise and specific answer for the research questions.
3.4.1 Data collection and selection

The purpose of collecting empirical data is to help interviewers and to analyze the influence of performance climate on knowledge sharing. The empirical data is collected by semi-structured interviews based on the chosen interviewees. Meanwhile, the interview guide would be strict to the information generation, which will discuss later. Furthermore, as mentioned above, the essence of this research is qualitative, which is further assertive evidence to take semi-structured interviews.

After deciding on taking semi-interview structure, the interview guide has been made (see appendix 1). For this interview guide, in dear to ensure the comprehensibility and intelligibility, the questions of interview guide avoid using complex theoretical concepts and terminology (Bryman and Bell 2007). In addition, this interview guide also has a flexible structure. This because that it could permit a depth understanding of the topic and create a flow through a given topic structure (Bryman and Bell, 2007). Nevertheless, due to the specifics of semi-structured interviews, this interview guide could be changed and adapted during the interview. This because in the real situation, the interview might not follow the designed order, and some extra questions could arise throughout the interview (Bryman and Bell, 2007).

The interview guide aims to reveal the interviewees’ knowledge sharing context and individual views on performance climate. The structure of the guide covers different topic areas, and it is succinct and clear even if broad questions exist inside it. This kind of structure helps interviewees know the case subjects better and build up a tighter relation with the interviewees in a brief interview time.

Meanwhile, this interview guide does not have the weaknesses after several checking, such as misunderstandings of the used terminology, which is the common problem of interview guide according to Turner (2010). All interviews are conducted in the meeting room of Zemax face to face, which allows researchers understanding interviewees’ language and meaning better
Due to necessity of respect interview's pace (Laforest, 2009), the average interview time is around 25 minutes per person. Both authors participated in interviews, but each author was responsible for one team member at one time.

Data selection is well-defined as the process of indicating the decisive and appropriate data type, data source, as well as suitable instruments to collect data. For the data selection, the explanation of primary data and secondary data becomes necessary. According to Saunders et al (2007), primary data is the one in which the researcher collects information through various methods like interviews, surveys, questionnaires etc. Secondary data is collected by a third party not related to the research study, but who collects the data for some other purpose and at a different time in the past. Due to the fact that this study has accepted by a chosen company, accessing data is much easier for the researchers. The situation benefits researchers to gather data by themselves, and to comprehend the relationship between a knowledge sharing and performance climate. Thus, only primary data is used in this research, and secondary data is irrelevant.

3.4.2 Data analysis

As discussed above, this research follows the qualitative approach when it comes to collecting and analyzing data. In order to collect empirical data comprehensively and extensively, the interviews have to be recorded and transcribed. Recording and transcribing the interviews could overcome the limitation of memories (Bryman and Bell, 2007). Besides that, through recording and transcribing, authors could use direct quotes in their thesis to show the significance (Ghauri and Gronhaug, 2005; Easterby-Smith et al., 2008). The objectivity of this case could be increased, and less influence of biases and inaccurate appears in the analysis process (Bryman and Bell, 2007; Saunders et al., 2007). According to Bryman and Bell (2007), transcribing an interview is a beneficial way to illustrate communication and allows for objectivity in order to grasp the complete conversation. Scholars also mention that although most conversations are illustrated as verbal annotation, the gestures and body language still play a major role in conversation. However, non-annotation (such as gestures...
and body language) is not relevant and subjective to this research. The data analysis and transcript thus will be based only on verbal communication.

- **Data Coding**

After the interviews are transcribed, those transcribed data are not analyzed directly, because most of the given answer are not organized and structured. According to Saunders et al. (2007), those huge amount of transcribed data could increase the complexity of analysis. Therefore, data analysis is necessary for research finding in the case study. In this research, coding information would help researchers to analyze and to compare the different responses from the taken interviews. This method is simplified the task to identify that the relationship between performance climate and knowledge sharing.

In the first coding phrase, because some questions are closed questions, the answers are easily compared and concluded. For the rest open questions, which have long answers in a very detailed way, the coding method is going to use for summarizing those in bullet points, because such detailed answers are not relevant for answering the research question. Additionally, color coding is used to highlight different responses of interviewees on the same subjects, which does not mix analysis of the interviewees’ viewpoints. According to Saldaña (2013, p3), coding in qualitative inquiry is “a word or a short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language based or visual data.” This could help researchers identify the reviewed theory in practice, which has been discussed with the interviewees. Moreover, color coding also allows researchers to identify important keywords, such as: socialization, helping behavior, time, knowledge hiding and so on. These keywords are later used for compiling the empirical part of this thesis.

In the second phrase of coding, those keywords are copied into a Microsoft Excel sheet. In addition, answers regarding how the cases demonstrate and restrict knowledge sharing are also copied into the Microsoft Excel sheet. Based those two sheets, authors label the
keywords to create categories. After labeling all keywords, reducing overlapping and redundancy among categories become the main work (Thomas, 2006). Authors try to build a model or answer for the main research questions through selecting appropriate and important categories. It is worth noting that a specific objective (research question) guides authors to organize this model or answer (Thomas, 2006). Meanwhile, with the help of theoretical concepts, which are found prior to conducting this case study, a completed pattern about knowledge sharing inside chosen company has been identified. Furthermore, those subcategories and commonalities which are the answers for those two sub-research questions also found based on those keywords.

3.5 Research quality

Research quality is another essential factor when considering the research methodology for this master thesis. More precisely, it is referred as reliability and validity. Good research has to be objective (Krik and Miller, 1986), which means that reliability and validity should be considered in the field of the used data. In the next part, the reliability and validity of the study are going to be explained.

3.5.1 Reliability

It is necessary for the research study to be reliable through its empirical data collection (Bryman and Bell, 2007), because reliability could minimize the errors and biases in a study (Yin, 2009). Yin (2009) points that the way to establish the reliability of the data is to define and to describe the replication of the action until it become clear. In addition, Seale (1999) states that the examination of trustworthiness lies at the heart of issues for reliability in qualitative research.

The data in this master thesis is reliable for two reasons. Firstly, the data collection method is reliable. The transcriptions are used to describe and explain the interview data in this research.
The data is all collected through conducting semi-structured interviews, which enhances the possibility of replicating the interviews’ process. Further, the answers are also freely elaborate and unstructured. This replicate enhances the reliability of the interviews and ensures that the data used in this thesis is reliable, based on the Yin (2009) theory. Another reason is that this study takes place inside of the company. As discussed before, having research inside the company is rather helpful to understand and gather more information and data. It also combines both internal (the interviewees) and external (the researchers) points of view for this study. This combination improves the trustworthiness of data, which secures the reliability of the data collection, according to Seale (1999).

3.5.2 Validity

Validity is considered as the truthfulness of the finding, which has two different types: internal and external validity (Bryman and Bell, 2007). The internal validity is perceived as the strength, especially for the qualitative research, which aims to ensure the necessity to use the concept of theory to confirm the truthfulness of the finding (Bryman and Bell, 2007). This is because of “prolonged participation in the social life of the group over a long period of time” (Bryman and Bell, 2007, p395). Therefore, in this study, the internal validity is used to confirm the truthfulness of the finding. This inside view allows research to collect enough data in order to explain the case in a more explanatory manner. This unique investigation perspective supports the internal validity of findings.

External validity is used to “deal with the problem of knowing whether a study's findings are generalizable beyond the immediate case study” (Yin, 2009, p43). Sekaran and Bougie (2010) argue that the subject selection and its interaction would influence external validity. In this case, each interviewee is the main participant of knowledge sharing, and works under a performance climate as well. This selection ensures that interviewees personally experience the influence of performance climate on knowledge sharing. This has reflected by setting this study in the physical world, and has proved the external validity of the findings.
3.6 Research limitation

Although the research design is reasonable and rational, this master’s thesis is considered to have certain limitations. Primarily, this study has interviewed two project teams which have great similarity in a single company. However, differences still existed. This means that the empirical findings of this study will be influenced by these differences. In order to build stronger implications on existing theory, it is important to eliminate affecting elements. Nevertheless, these two project teams suggest a high possibility of identity for the research.

The second limitation is that, due to manner of approaching this research, this study has reviewed a plethora of articles on a selected number of scholars, which form a particular view on performance climate and knowledge sharing. This indicates that the influence of performance climate on knowledge sharing has been studied by many academic, therefore there is always a possibility that there is more theory to review and compare in relation to the chosen subject.

The last limitation is that all empirical data is from interviews. Analyzing interview data, especially on the coding step, is mostly determined by the researchers’ personal view. To some extent, the coding step can be biased to one person’s interpretation, however, daily discussions and analysis between two researchers have helped achieve a more objective view.
4. Empirical study

This following chapter indicates the empirical case in order to explain interviewees’ answer to the research question. The chapter is divided into two main parts. The first part is the presentation of Zemax, which focuses on the project team members under a performance climate. Then, the insights from interviewees about knowledge sharing and the restricted and facilitated factors are going to be searched. This case will follow the factors influence knowledge sharing under performance climate which are noticed by interviewees. The objective of the chapter is to improve the understanding of the knowledge sharing in Zemax.

4.1 Case of Company

Previous theories suggest that performance climate has negative influence on knowledge sharing, finally losing the competitive advantage. To execute these theories, this study explores an example of Zemax. The knowledge sharing of this company is engaged inside project teams, which has a long-term influence to share knowledge between different knowledge level backgrounds. Including the main purpose of identifying the research question, the gathered information on the company itself will also be included in this chapter.

4.1.1 Background of the company

The Zemax is a Swedish independent technical consulting company and part of defense and security group for another company. It has Nordic base segments, but it also works with clients internationally. Zemax is growing both organically and through acquisitions, with almost 1,900 qualified consultants in some 30 locations among Sweden, Norway and Finland. They have rich experience in information security, systems safety, logistics, systems integration, systems development, robust communications, technical product information and mechanical engineering. Besides that, Zemax is project based, which stipulates that employees
work in projects. This means that employees have to work with Zemax and each other in the long term. This structure is due to the high-tech company itself. Most tasks are impossible to work alone, therefore project based is a good choice to deal with complex and urgent task. To be more specific, Zemax focuses on providing high delivering capacity and offering a wide range of specialist skills and concepts to clients operating in manufacturing, the service industry, public sector and defence. Generally, Zemax is considered as an experienced partner in all areas dealing with technical systems, development and value creation.

The extensive experience of Zemax causes the uniqueness. This company combines technical expertise with in-depth industry knowledge, universally capability and a specific attention on the environment and security. Due to this uniqueness, the customized, sustainable solutions for demanding clients are active both in the Nordic area and international market. Meanwhile, this company also developed a high-tech, competitive and demanding environment into the company. This kind of environment leads to cutting-edge products, services and systems. All these advanced products ensure that the company provides the powerful capabilities through accessing wide knowledge and a number of specific and creative concepts in the form of testing and development environments, as well as products. Additionally, Zemax utilizes a unique way for knowledge sharing, which we will discuss in the next part.

4.1.2 Performance climate

As mentioned above, the environment leads a competitive advantage. This kind of environment is described as performance climate by company’s line manager: “Definitely, we are performance climate, and there are lots of measurements for different object: the project team members, line managers, the whole project team and so on”. This line manager who welcomed us also believed this climate would lead a new focus in the company.
During the interviews, several questions were asked about how interviewees considered their working climate in their respective company. Most interviewees liked the climate inside the company. Following are the summary of six interviewees who supported having a performance climate inside the company. Each of them gave their own particular reasons.

(Figure. 6)

Table 6: Reasons of interviewees

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee 2</td>
<td>“...under this climate, it is good to get feedback and how you do work if it should...And it also glad to know what you do is good and what is less good.”</td>
</tr>
<tr>
<td>Interviewee 4</td>
<td>“…it would help individuals to improve themselves.”</td>
</tr>
<tr>
<td>Interviewee 5</td>
<td>“it is good for finding knowledge lacking”</td>
</tr>
<tr>
<td>Interviewee 6</td>
<td>“This is the only way to go, no negative thing to knowledge sharing, and it is also best way for young guys to learn more knowledge”</td>
</tr>
<tr>
<td>Interviewee 7</td>
<td>“it is quite good.”</td>
</tr>
<tr>
<td>Interviewee 8</td>
<td>“We did some retrospective but only try to lift employees and appreciate them if they did some good...”</td>
</tr>
</tbody>
</table>

Figure 6 demonstrates why interviewee 2, 4, 5, 6, 7 and 8 like the performance in Zemax. These project teams believe that a performance climate is essential and beneficial for the company in order to stay ahead of its competitors. However, this viewpoint is not shared by everyone. TM 1 deemed that “actually, it is hard to see the benefit of this assessment...Perhaps, people are bit frightening to be evaluated”. Therefore, the performance of project team under performance climate has to be influenced. The performance climate brings uncertainty through increased evaluation for the project team members:

“each people do things according to the measurement, I don’t know whether they do the things in correct way [...] if they take ten hours to get solution and meet the evaluation standards, but the solution is not correct. Maybe they are required to find the solution within one hour, however, nobody could find solution within 20 hours (for this task). Actually I don’t know how to judge other people work effectivity just through measurement”
Based on this note, TM 3 estimated the negative part of performance climate which could influence team members’ work, and even disrupted the proposal of the plan. This set a vision for performance climate which was proved by several scholars. However, other obvious damaging characteristics of performance climate, such as impeding knowledge sharing, causing knowledge hiding, and lacking creativity, are hard to find from interviewees.

On the contrary, during the interview, all interviewees did not feel side effects caused by performance climate. Every project team member described himself/herself as someone who possessed sufficient knowledge sharing for every task within his/her project team and within the whole of Zemax. TM 7 showed an example:

“We are trying to encourage people to ask question [...] it is easier to ask questions because there is no people to disturb and distract. And you can catch something when you wait for someone else. If two people closed to me for discussion something, I can pick up a few parts of that and use my advantage to think.”

(Apparenty, an open atmosphere for frequent and tight communication exists in Zemax even if this company is under performance climate. All interviewees are convinced that a strong knowledge sharing inside project teams and within the whole company exist (Figure. 7).
Table 7: The Knowledge Sharing Ways

<table>
<thead>
<tr>
<th>The strong knowledge sharing</th>
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</thead>
<tbody>
<tr>
<td>TM1</td>
</tr>
<tr>
<td>TM2</td>
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<tr>
<td>TM3</td>
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<tr>
<td>TM4</td>
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<td>TM5</td>
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<tr>
<td>TM6</td>
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<tr>
<td>TM7</td>
</tr>
<tr>
<td>TM8</td>
</tr>
<tr>
<td>TM9</td>
</tr>
</tbody>
</table>

Figure 7 reveals how strong knowledge sharing existing inside project teams and the company. Every project team member is linked through integrated knowledge sharing within the daily work. This implies the fact that Zemax set up several ways to cover the shortage of a performance climate. This is in order to achieve sufficient knowledge sharing to run the project and to adapt a high speed working style. TM 8 explains in detail that project team members inside this company want everyone to know the project, to have knowledge on their (project team members) legs and to solve problem by themselves. Therefore, everyone is willing to share knowledge to make their team members become highly skilled in the knowledge area in their task.

This willingness, in fact, lays a solid foundation for knowledge sharing, although it is in the social comparison and intra team competition environment. Moreover, the company has understood that adequate knowledge sharing amongst project team members will allow the project to be done in a timely manner. Therefore, the company decides setting courses, intranet, and morning meetings to facilitate knowledge sharing.
“We have. I don’t know how to call that. It is like a club. If you are interested in a field, area, something like that, we have a team teaches other staff. [...] Everyone can start this kind of club, and company would support you and encourage people to go to this club and share knowledge.”

(TM 1)

At this point, knowledge sharing inside Zemax does not work in a hindered, erased or deficient situation, which is just the opposite of other performance climate companies. Although the company has several methods to encourage knowledge sharing, there must be some other reasons to facilitate or restrict knowledge sharing. Those underlying reasons which are implemented inside the company give project team members different experiences of knowledge sharing, which allows Zemax to be standing at the forefront of the industry. This will be described in the next part.

4.2 Knowledge sharing

Now that the backgrounds about the cases have been outlined, the following parts are going to find how interviewees share knowledge in their everyday task. Therefore, firstly, it is pointed that which factors improve their efficient of knowledge sharing. Secondly, those unfavorable situation are also identified, trying to give an overall picture of knowledge sharing. Project team members are the main participators, thus the real situation to share knowledge within project teams is going to present. This includes all the preparation and basic work done by project team members to ensure the best quality and smooth knowledge sharing.

4.2.1 Helping factors

The project team members of Zemax understood that there would be some differences in knowledge sharing between other company. The willingness of knowledge sharing seems to be promised to guarantee that everyone enjoys sharing knowledge to others, although
individual measurements are in company. The willingness to share knowledge within project teams is a crucial part of Zemax. In the words of PM 6:

“as soon as we set a project team, we say that we want this (knowledge sharing), this is a goal to achieve this kind of environment. And when we are taking interview, and getting new people into the team, it is very clear that we want to work like this. Some people want to sit and work by themselves. That’s very good, but (they are) not people we are looking for hiring in our team. You have to be social and share.”

(PM 6)

Since recruitment, when the project is set to start, all team members are required to have strong willingness in knowledge sharing. It has become a common goal in Zemax. Hence, when team members have lack of knowledge and look for help, the rest of the team members are the best choice. As TM 5 said “we help each other, and we are likely to answer questions. [...] People will help others as much as possible”. Lots of helping behaviors are done by team members. Before proceeding to this recruitment, knowledge sharing is to some extent different. This ensures that everyone in the project team can develop herself/himself through sharing with others. After the specific recruitment, when Zemax organizes project team, the knowledge layer is also considered. The interviewees also show the diversity trend which is mentioned in the Methodology chapter. As the words of PM 6:

“we try to combine a bit older and a bit younger together, because I want to learn the knowledge of the learning guys with more experience. [...] we have diversity age in the team.”

(Interviewee 6)

Moreover, 5 out of 9 interviewees showed that they enjoyed the process of knowledge sharing. Each time, when knowledge sharing has been started amongst team members, the mood of
team members has become delighted due to the knowledge sharing itself. Although interviewees are represented in different ways, the meanings are the same (Table 8).

Table 8: Mood of knowledge sharing

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>The mood of knowledge sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee 1</td>
<td>“It is a good feeling that sharing knowledge with others.”</td>
</tr>
<tr>
<td>Interviewee 3</td>
<td>“My willingness encourage myself to share more (knowledge).”</td>
</tr>
<tr>
<td>Interviewee 6</td>
<td>“Helping other could feel appreciation, that make me to share…and to see team members getting better and better”</td>
</tr>
<tr>
<td>Interviewee 7</td>
<td>“it is fun to teach and to help someone perform better”</td>
</tr>
<tr>
<td>Interviewee 8</td>
<td>“I like to teach and help people.”</td>
</tr>
</tbody>
</table>

Table 8 demonstrates the actual emotions that occurred during knowledge sharing, indicated by the project team members. The results showed that team members who were employed by that specific requirement have considerable autonomy for knowledge sharing. Thus, it creates a beneficial cycle inside Zemax, as TM 3 said “The feeling of sharing knowledge facilitates us to share more knowledge”.

This high willingness to share causes a tight cooperation inside Zemax. Particularly these interviewees can see there is no knowledge hiding existing in the daily tasks as well as in teaching others or learning themselves. This fact is proved by 7 interviewees out of 9:
To pull all views together, it reflects an effective and cooperated knowledge sharing. This allows the team members to be capable to swap or share knowledge with each other more freely if it is required by some situations. This type of approach to share knowledge in view of TM 4 also benefits employees, because under this environment, people are attracted to work in the same area, then more knowledge could be shared to develop themselves. Allowing the team members to be active and encouraging them to share more knowledge with others is a key to drive the knowledge sharing more tight and cooperated.

During cooperated and tight knowledge sharing, different types of communication and socialization are appeared in the company. As mentioned above, intranet is the popular tools to share knowledge among project team members.

“Be able to handle that (the new task), we set introduction for new area which we are supposed to work with. [...] Using web page to share knowledge [...] the first

<table>
<thead>
<tr>
<th>Interview</th>
<th>Answer for knowledge hiding</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM 1</td>
<td>“There is no hinder factor. People could always get help from their patterner”.</td>
</tr>
<tr>
<td>TM 2</td>
<td>“No, no knowledge hiding at all.”</td>
</tr>
<tr>
<td>TM 3</td>
<td>“Of course not. We did not hide knowledge.”</td>
</tr>
<tr>
<td>TM 5</td>
<td>“No factors to hinder knowledge sharing. And it is convenient to find help.”</td>
</tr>
<tr>
<td>PM 6</td>
<td>“No problem in knowledge sharing.”</td>
</tr>
<tr>
<td>TM 7</td>
<td>“No one hides knowledge. We try to keep open atmosphere for asking question.”</td>
</tr>
<tr>
<td>TM 9</td>
<td>“No, no problem in sharing, everyone is quite open.”</td>
</tr>
</tbody>
</table>
guy who learn new knowledge, he/she should put the new information on the webpage. Someone could learn from that after a while.”

(TM 4)

The experience of intranet confirms that technology methods of knowledge sharing is a common way to share knowledge from another angle. TM 3 said answering questions through e-mail is his favorite way for knowledge sharing. Based on this practice, the team members are not assigned roles regarding who is going to teach and who is going to learn and when, vice versa. Technology allows cross socialization and communication activities to start. The role of teacher and student could be changed. It is flexible for team members to go to the person who can best solve problem, or to go to the person who is fresh in the team.

In addition, another successful socialization and communication of knowledge sharing is face to face meeting, both informal and formal. As a matter of fact, Zemax has already offered forma method to share knowledge—the morning meeting. Due to TM 3, the morning meeting is used to make all members in the team aware of what they need to do, and share knowledge with each other. Similarly, TM 4 stated that, he could learn and develop himself through the morning daily meeting. He elaborated that in that meeting, everyone communicates a lot and has positive attitude to share knowledge. TM 2 also proved that:

“we have a regular meeting in the morning about what are we doing and what to do next. If we have some new ideas, we can take it here. I prefer to share knowledge in the morning meeting.”

(TM 2)

The morning meeting is highly praised by project team members whereas, the informal face to face meeting is the most frequent knowledge sharing way inside Zemax. All socialization and
communication in break time or fika time, even after work, are considered as informal face to face meetings. TM 7 said “in break time, there is more informal socialization about everything”. The informal meeting remedies those weaknesses that formal meetings cannot cover up, and it also integrates knowledge sharing tighter with team members. This leads to a situation where each project team would have an open atmosphere to share knowledge, executing their tasks favourably.

In general, these face to face meetings can provide a wide thoroughfare for knowledge sharing. It is easy to see that sometimes technology is inconvenient to be best way in organization for knowledge sharing. This fact was revealed by one interviewee, saying:

“I communicate with people who know this question well through kind of software, but if it is a complex question, you might communicate like us (face to face).”

(TM 1)

All in all, recruitment, technology and face to face meetings prove knowledge sharing to be effective and positive, since Zemax is set up under a performance climate. These approaches for knowledge sharing benefit project team members and give an extra satisfaction in their daily work—the self-gratification by knowledge sharing. Although knowledge sharing is going well, Zemax and its team members are still looking to create more opportunities or methods to encourage employees to share knowledge with others. When new methods are developing, the unsatisfactory points need remediation as well. As the matter of fact, the interviewees have already noticed the drawback of knowledge sharing inside the team.

### 4.2.2 Prerequisites of Socialization

The basic composition of Zemax is a project team. It is interesting to mention that some unfavourable situations exist within project teams. Although knowledge sharing is good in Zemax, some situations still limit knowledge sharing and finally impact the task finishing level.
Indeed, the practice for knowledge sharing of Zemax involved several different methods. However, some unpleasant phenomenon generally exists, according to PM 1. Project teams in the company are not very big and so, the working area of each project team is quite small. People sit with each other, which allows team members to share knowledge by asking the person sitting next to them. This kind of knowledge sharing save times and ensures smooth knowledge sending and delivering. An obvious factor appears, which is noticed by TM 8:

“We are sitting close with each other, actually it is good. But it is so crowded, and many people in one are. It is related to some noise during the working.”

(TM 8)

Despite the fact that tight and frequent knowledge sharing exists, the circumstances suggest that knowledge sharing is not perfect. The disturbance of the task operational difficulty in working areas stems from knowledge sharing itself. This strong knowledge sharing in Zemax is not great enough and requires additional help to finish the daily task. PM 6 who is both a project manager and project team members is also convinced that “Sometimes it is bit loud, because everyone is talking”.

This side effect of knowledge sharing is reflected by 4 interviewees. Each of them mentioned that when there was no enough space for discussion, only meeting rooms could be used. It is interesting to notice that most of those interviewees have over 20 years working experience, and they are the person who answers the questions most of the time. TM 7 also explained the reason for it:

“we need to make sure of the security of it(room), so we cannot use every conference room in the building [...] We would want work under disturbance, but we mainly work in the meeting room, because of the security certification.”
At this point, finding a quiet and comfort place to carry out a discussion with others becomes the priority for project team members, because it is easier for people to get distracted under these circumstance. However, this behaviour is wasting time, since it is uncertain whether that kind of place is still free for team members to be able to share knowledge with their colleagues, especially during working hours.

Although, the confined working area is negative in a way, this circumstance is not the worst one. As a matter of fact, almost all project team members are able to execute their task and share knowledge in that narrow place. This working environment does not eliminate the benefit of knowledge sharing. However, not all team members enjoy the fruits during the knowledge sharing stage, according to TM 7, who has rich knowledge and experience.

“Ask someone else means you need to disturb the person who are working. It takes a while when you have entire time in your hand. [...] Asking someone else benefits the questioner but does not benefit too much for the people who answers.”

After all, team members have no responsibility for dealing with other’s questions and distribute the answers amongst the team members during task. This means that it is hard to guarantee that every team member can achieve something from knowledge sharing. Even though there are tons of positive response to knowledge sharing from the team members inside Zemax, knowledge sharing might not be a win-win practice to a greater extent. When people give answers to others’ question, it is hard for the questioners to give new ideas and reactions for the future development of this question.
After describing this existing phenomenon, TM 7 said that actual important aspect is that when team members ask for help from someone else, they might lose focus, which is not so reflexive. All team members are able to perform all tasks that come under sufficient knowledge sharing. However, engaging in the team member’s common knowledge with the help of instructions and discussions cannot ensure the task progressing a lot quicker. This is because it is difficult to predict which question comes up next, as well as how much knowledge has been grasped from previous help assistance.

“sometimes, you cannot get such formal knowledge to solve this exact problem, because you solve this problem together. Then you move on... the new problem is kind of variation from last problem, and I did not solve that problem by myself. Thus, I need to ask that person again.”

(TM 7)

The situation has clearly dictated the weakness of the knowledge sharing method. Team members try their best to share knowledge with others. In spite of this effort, the effect of knowledge sharing has not reached the intended level. Moreover, this implies that the people in project teams are at different knowledge level, which has been explained in the last part. Another factor influencing knowledge sharing derives from this reason.

4.2.3 Time

According to the TM 4, due to a tight deadline, there is not enough time to share knowledge with each other. In his view, the actual issue here was that considerable activities need to be focused on, and it is hard to find time to share knowledge with others under that busy situation. This makes sure that team members who have abundant skills want to share knowledge by any means, but are just not permitted by time:

“you have to compare the importance of these (task and knowledge sharing) [...] if someone has knowledge, maybe others don’t have in the team. You might ask him,
but he has no aim to share it, because he is too busy. [...] sharing his knowledge to others might take some time. Of course, it is impacted the daily operation work”

(TM 4)

The main issue here is how to have more knowledge sharing within a specific time. Particularly due to the nature of the task (high-tech products), almost every team member is operating several tasks at the same time. As the team members have noticed, others lack knowledge to execute their task, whereas not enough time supports them to share their knowledge or experience with others. Meanwhile, with the rapid development of science and technology, the tasks of Zemax become complex. Some tasks require more skills and expertise, which needs a longer time to share and learn. Therefore, team members cannot share knowledge as much as they want.

Moreover, TM 1 explained that some project team members were not able to take part in knowledge sharing just due to not having sufficient time. The reason behind the time shortage, according to TM 1, was the unnecessary work

“we should be focused on delivering knowledge all the time [...] lots of interruptions, meetings are in the work”.

(TM 1)

TM 2 also pointed out that the fika schedule was changed in order to increase their working time. Thus, under this situation, the team members do not have time for knowledge sharing due to increased workload or work time. As a result, it causes difficulties to increase knowledge sharing for the whole project team.

For Zemax, these difficulties are a challenge for the future development of the project and implementation of knowledge sharing. This, in fact, allows company to grasp more ideas to find solutions and look deeper into this problem, achieving success in knowledge sharing eventually. As one of the interviewees states it:
“the challenge is always making time for it (knowledge sharing). You have a task and it have to be fixed, and it is waste time to share knowledge as well. That could be hard, because in sometimes you should have more meeting, more discussions, but you have to fix the task first. That is the priority, which is really hard.”

(TM 6)

No one in Zemax was able to explain as to how to deal with this lack of time, even though they have already had experience of supporting knowledge sharing. This time impacting knowledge sharing still sustains. Although, the first priority is the task, all the team members are still engaging more knowledge sharing that come under performing all tasks. This is because project team members believe that with the help of knowledge sharing activities, tasks could progress a lot quicker.

“we want everyone to know the project, to have knowledge standing on their own legs and to solve problem by themselves.”

(TM 5)

TM 9 posted further explanations “we make everyone can do everything, and it can also reduce the load of work”. When every team member has enough knowledge to deal with the task and has less work load, the whole project is accelerated. Based on the example shown by interviewees, the team members are struggling with negative factor to share knowledge with others.

All in all, the case apparently grants freedom and shows interviewees’ personal experience about their knowledge sharing under performance climate. In addition, this case also indicates that the real factors which promote or hinder knowledge sharing inside Zemax.
5. Findings

The empirical findings have revealed the significant influence of performance climate for knowledge sharing in the studied company. It visualizes the research finding model: the new recruitment ensures the helping behaviours among team members, even if under the performance climate. Technology and face to face meeting are two main socializing and communication ways of knowledge sharing for project team members. However, time is the foundation for knowledge sharing communication and socialization, instead of performance climate. Under performance climate, project team members will have high performance in knowledge sharing if time is permitted and because of their helping behaviours which is opposite to the theories description.

The empirical findings have revealed the considerable information of knowledge sharing for the studied company. A detailed analytical process, which has outlined in the Methodology section, resulted in a selection of findings, which are provided below.

5.1 Primary results

Although the answers from interviewees is different and unique, the single case analysis relied on that interviewees have certain common keywords, which have been showed in Appendix 3. Selective coding, followed by appendix 3, allowed grouping of common results (see Figure 7). These qualities helped in understanding the real relationship between knowledge sharing and performance climate under PBOs. All together with findings presented below, revealed that this company has the capabilities to own an effective knowledge sharing under performance climate, which normally impact knowledge sharing negatively according to literature.
To be more specific, this primary survey results can be described, as a result of the transcription and coding procedure which shows the frequency of the correspondent keyword for each interview question among nine interviewees (Figure 7). It also demonstrates common answers for the interview questions, which indirect reflect the project team members’ real feeling to knowledge sharing in Zemax. (Figure will be elaborated more in discussion section.).

5.2 Knowledge sharing method

Now that the backgrounds about the cases have been outlined, there are several important things to draw from the empirical study. First of all, some primary findings could be found from the case demonstration that how knowledge sharing works under performance climate inside Zemax. Therefore, firstly it is outlined, how team members ask for help is clear. As matter of fact, attending course or club is not the first priority for project team members, although it is provided by Zemax. Most of team members prefer to asking their colleagues, just as TM 4 said

“**Asking team members is the most common way to ask for knowledge. For some specific knowledge will go to course. Then, going to line manager to find help”**
which also indirectly reflects the general way to sharing knowledge. Figure 8 shows the sequence of knowledge sharing in Zemax.

**Figure 8: Knowledge Sharing Methods Inside Zemax**

From the case, it shows that team members provide active support related to the best practices for knowledge sharing through offering help to their colleagues. Besides that, company provides intranet and course for employees as a way of actively knowledge sharing way. Knowledge provided by those methods related primarily to technical expertise and, to some degree, financial expertise. Course provide by company are conducted mostly around specific knowledge and skill relevant to the current task. Furthermore, the line manager is also a source of knowledge about past projects, and the project team members will go to line manager to find help if they cannot get help from others.

Based on interviews, this model has engaged in the process of knowledge sharing and has also undertaken considerable effort under performance climate. It has been identified that the automatic knowledge sharing method facilitates the efficient of knowledge sharing. Moreover, it was also identified that due to the existing of the knowledge sharing model, team members appear to be extraverts, chatty, oriented towards relationship-building. For example, they understand the needs of their colleagues and their daily activities, and they encourage people to get new knowledge in a manner that ensured the accomplishment of project goals. Thus,
this primarily implies that the how knowledge sharing can counteract the side effects of performance climate.

5.3 Socialization

The case study demonstrates the different views about socialization inside Zemax. In the light of descriptive statistics below (Figure 9), it can be seen that most of the respondents agree that they feel the presence of socialization in their organization. The majority of them believe that it is essential for effective knowledge sharing. But some of the respondents also feel that socialization at work place creates disturbance and distraction and they often lose focus of their task because of communication around them. They also recognize that performance climate has a positive effect on knowledge sharing and it enables project members to perform better in several ways. Similarly, the role of team members is considered to be imperative for knowledge sharing activities when compared to the role of information technology.

*Figure 9: Responses for Socialization at work place*

Meanwhile, a majority of the interviewees state that project team members in the PBOs like helping each other and prefer face-to-face interactions instead of writing and reviewing documentations. Phone or talk are their preferred choice to share knowledge with instead of
searching in databases or documents for information. This because they could achieve more information through a face to face socialization, and get better understanding of the context and more examples than available in the documentations or in the intranet.

Respondents from interviewees revealed that the socialization could play such an active role in facilitating knowledge sharing. Furthermore, it was reported that this company has already provided enough effective communication and socialization between team members. Project team members are actively involved in facilitating both formal and informal face to face meetings. For example, the company organized monthly forums which team members prepared short presentations on problems they had encountered in their projects and how they resolved them. Moreover, they could approach to line manager’s officer at any time to discuss the issues they encountered in their projects, which had introduced at the beginning of this section.

5.4 Influential factors for Knowledge sharing in Zemax

The second objective of the study is to determine the critical factors for effective knowledge sharing in project work context, which as mentioned in Chapter Introduction. Looking at the influenced factor for knowledge sharing chosen by all interviews, it is evident that the majority of influenced factor is the time (Figure 10).
Data across all nine interviewees revealed that team members often did not have the time to share knowledge with others for future projects. As a consequence, team members commented that time impacts their attitudes of knowledge sharing. Due to the tight time, project team members prefer to utilize their task instead of sharing knowledge with others, even if their colleagues face critical situation.

Figure 10 demonstrates that project team members believe different factors could influence knowledge sharing. In terms of factors, time shows the majority of 37 per cent of respondents, whereas 25 per cent of interviewees believe that no negative factor influences knowledge sharing inside Zemax. Thirteen per cent interviewees believe the knowledge level and the management and infrastructure is the main challenge for knowledge sharing respectively. Only twelve per cent think the project itself prevents knowledge sharing within teams.

This figure also deems that the degree to which each of the four factors was perceived to be crucial to knowledge sharing or causing challenges in the respondents of organization. It is apparent from the results that a lack of time and absence of infrastructure (knowledge sharing rooms) are perceived to be most significant barrier for successful knowledge sharing initiatives in project teams. The presence of knowledge hiding behaviour and familiarity with technology are less significant barriers. The role of project manager is considered to be the least significant barrier to the effective knowledge sharing in projects.

However, it is possible to argue that effective knowledge sharing is start with efficient time management of projects. Then once different challenges occur, the flexibility in time management can replace the one activity with another. This can fix the continuation of effective knowledge sharing in project teams and solve the stress issues of the team members which occur due to the lack of communication rooms in the Zemax. Because of flexible time management team members will be able to hold their questions and discussion for the breaks so the rest will not be disturbed by them. As a result, it becomes logical to claim that the more
the team members will socialize under less stressful conditions, they will eventually learn more from each other experiences.

5.5 Level of experience

Another finding in the empirical data relates to the level of experience that the team members have influencing the knowledge sharing. In some interviews, team members speak of a predominantly positive attitude towards knowledge sharing in the working area, while, in other interviews, they express a much more passive attitude because of the disturbance from knowledge sharing. If looking at the answer of interviews who consider communication as a disturbance at work place, they are comparatively more experienced and above 40+ age people, which means those people have rich experience. Thus, the team members’ level of experience also impacts knowledge sharing. It is also becoming interesting to engage in more studies on specialized knowledge sharing towards beginner’s level in project team members.

To summarize, performance climate has a moderate to strong positive relationship with most of knowledge sharing activities. Then effort to promote performance assessment in projects can be made by putting emphasis on an open culture by introducing knowledge sharing activities into the projects such as by empowering employees and making them more mobile. This emphasis also tries to eliminate those challenges caused by performance climate which can lead the knowledge sharing to change. That also demonstrates that the company either can attempt to cooperate the knowledge sharing or adapt it for performance climate. Moreover, the study has also showed that the impact factors of knowledge sharing that company should be considered.

Ultimately, the goal of performance based assessment in the Zemax is to promote the knowledge sharing culture and build the sense of knowledge sharing willingness aptitude for their employees among other team members. However, according to the results, the presence
of performance based assessment in projects is not strongly correlated with knowledge sharing activities.
6. Analysis

Chapter 6 would lead to the case analysis, which could bring this study closer to the research purpose and empirical data. All detailed answer to the research question comes in further part of this chapter. After the main discussion finished, the analysis continues with conclusion of the reason to share knowledge in section 6.4.

Furthermore, the authors are supposed to discuss the research objectives, as well as to deeply analyse the most relevant and valuable findings. Besides that, a visualization framework which relates to the finding and analysis chapters is presented, which aims to offer a common model for PBOs. The model for knowledge sharing under the performance climate is mainly discussed in this chapter. Because the factors that influence knowledge sharing through the performance climate have already been analysed in chapter 6. This provides a good opportunity to do a further summary.

In this study, authors have investigated the influence of performance climate on knowledge sharing activities in PBOs. From the literature, knowing knowledge sharing under performance climate is difficult and knowledge is hindered by project team’s members under these conditions (Sergeeva and Andreeva, 2016). However, a number of authors discuss the impacting factors of performance climate on knowledge sharing in project team members. By drawing upon from empirical studies, we divided our results into nine (mention below) different categories discussed below:

6.1 Documentation Vs Socialization

Although socialization can be considered as an important way to facilitate knowledge sharing between project team members, this does not mean that no knowledge can be transferred through documentation. Instead, it is possible to argue that because of the risk of missing out the dimension of tacit knowledge and the hidden parts of explicit knowledge on documentation, thus socialization becomes significant in order to ensure the sharing of all the
relevant and essential parts of knowledge (Nonaka et al., 2000). This indicates that the other approaches also need to be in consideration in order to ensure efficient knowledge sharing between team members. From this empirical study, we analysed that Zemax has provided both opportunities and socialization or documentation to their team members to ensure effective knowledge sharing in their organization. As already discussed in the empirical part, apart from socialization, organizations have created the Intranet system for team members to share knowledge with each other.

The Zemax case demonstrates important connections between the scholars understanding of knowledge sharing and socialization. Kogut and Zander (1992) and Williams (2008) argue that when organization rely on codification as a means to share knowledge, it is important to also be aware of the amount of knowledge that might be lost during the process of codification. It is highlighted by one of the project managers that some knowledge is easier to document e.g. explicit knowledge and thereby it becomes apparent that some knowledge which is acquired in projects cannot be documented. Therefore, when making use of documentation for the sake of knowledge this means that documents only contains knowledge which can easily be codified and formulated (Nonaka et al., 2000). This also means that the part of knowledge which is based on tacit dimensions unfortunately remains stored in the minds of individual project team members since sharing of tacit knowledge requires close interaction between individuals in order to share knowledge (Polanyi, 1966; Nonaka et al., 2000). Therefore, it becomes clear from an empirical study that the management of studied company was well aware of this problem and the introduced combination approach to share knowledge between team members.

6.2 Role of Technology

For the socialization, widespread technology and frequent socialization, especially face to face meetings, are the main methods used inside Zemax. Project team members in Zemax use their own technology system to share knowledge. It is very common that companies use technology to promote knowledge sharing in teams (Bock et al. 2005; Hansen 2002;
Majchrzak et al. 2004; Wasko and Faraj 2005). Although, implementing information technology which is particularly designed to support knowledge sharing among team members would cost significant investments (Bock et al. 2005; Wasko and Faraj 2005), Zemax still creates its own intranet and wiki page for engaging more ways for knowledge sharing.

Both internet and wiki page are included in information technology (Hansen and Haas 2001), which allow virtual communities of practices to be organized (Wasko and Faraj 2005; Wenger 1998). Due to information technology, the knowledge sharing through communication and socialization has boosted the efficiency. Project team members can share knowledge at any time and place, and waive the waiting time because of an immediate response. Sharing knowledge through technology is a popular way inside Zemax. Several team members prefer to have effective and frequent communication among team members on it, which has mentioned in the empirical chapter.

As is well known, most technologies are non-intrusive which have convenience accessed, and they may be well-suited for shy or very busy team members who prefer to avoid face to face interaction. However, information technology can not replicate the nuance and detail which only exist in face to face meeting. Face to face meeting is the main method in Zemax, according to interviewees. Most of time, they have morning meetings which invite top knowledge contributors or professional instructors to share knowledge and experience with members of project team. Besides that, knowledge sharing also happens at fika time, where there is face-to-face contact in an informal atmosphere. Under this environment, team members are more likely to ask each other questions and offer assistance. When people are talking with each other, the subject of their conversation consistently turns to what they have most in common—their task.
6.3 Experienced VS Novice

Nowadays, areas of experts have grown with extensive education and training in different fields. This can be considering an advantage is several ways because the more knowledge people acquire, the better they would be in its implementation and development. Moreover, organizations who develop new technologies and products usually create interdisciplinary teams by combining different people from different professional background and expertise. This require team members to fully share individual’s knowledge, because through this sharing process, the best possible outcome can be achieved in projects (Schmickl and Kieser, 2008). Similarly, in order to form the interviews, background we found that Zemax also followed the same mechanism to organize their project teams. They bring people of different ages together in which, some have several years of experience and some of them have just a few years of experience.

However, being an expert and working with other experts could create problems. Scarbrough et al (2004) explain these problems as “knowledge boundaries” to overcome. To be able to share knowledge within a project, all members need to overcome barriers arising from existing divisions and practices. The authors describe three different types of arising boundaries: syntax, semantic and pragmatic. Syntactic boundary explains how the lack of common ground between individuals or groups creates misunderstandings in communication. Semantic boundary explains how groups are unable to share knowledge since they bring different knowledge interpretations. The final boundary, pragmatics, explains how conflict could arise from different values and interests invested in the problem (Scarbrough et al, 2004).

Thus, knowledge sharing between team members from specialist come with communication problems as there are different perceptions and attitude. The challenging task in knowledge sharing from experts is the time-consuming dialogue among members of project teams. Some of the interviewees mentioned this in their answer, that on the one hand, they often feel disturbed and less focused when communication is going around them. Although they have no
problem in knowledge sharing, they don't want to communicate at the workplace because they believe that it becomes very noisy when everyone starts talking. On the other hand, those interviewees who have less experience in the organization want to communicate as much as they can in order learn new things and solve problems. They do not have any problem with the communication around them.

According to this situation, specialists and novices have different attitude towards to knowledge sharing in a place. The more experienced ones do feel stressful and disturbance during the task. The junior team members (who have lower experience) who may have a much more troublesome situation do not have such negative feelings, even if they are working in a new tasking area. This situation is totally inverse to Borg and Söderlund (2013) describing in their paper. This difference is caused by the diverse knowledge level. By acknowledging this interesting phenomenon, the company could prevent knowledge boundaries in advance.

6.4 Influence of performance climate on Knowledge sharing

From the empirical findings, it becomes clear that the individuals who are part of the performance assessment and evaluation, sometimes do not understand the actual time of assessment process. Only if someone has shown good performance during a month or a week, will they appreciate him/her by putting good and appreciating comments on the scrum board for them. Besides those situations, the performance based assessment are mostly perceived as additional obligations that are forced by the management in the organization. Thereby, the management does it because they have to keep record of employee’s performance and not with the aim to actually socially compare the employee’s performance with their co-workers. Other scholars, such as Sergeeva and Andreeva (2016) highlighted the performance climate as an obstacle to knowledge sharing activities in an organization. According to them, performance climate facilitates knowledge hiding behaviour among team members to perform
better than their co-worker and efficiency to gain a good position in the company. However, our analysis shows that this is not always the case in performance climate for knowledge sharing.

6.5 Influencing factors for knowledge sharing in PBOs

The empirical finding has revealed the considerable important of knowledge sharing for the study of companies. The management of the company has set up big initiatives to create effective knowledge sharing in project teams and one of the them is the recruitment process. The selection of knowledge sharing behaviours is a critical task for management to ensure that these people are willing to share knowledge with the rest of the team members, and do not possess knowledge hiding behaviour. Meanwhile, with the support from technology and face to face communication, knowledge sharing appears a positive trend in the chosen company.

However, an obstacle for these people and knowledge sharing activities is the time that needs to be dedicated for these activities. As already highlighted in the interviews, the intense working environment with tight deadlines and time schedules makes it harder for team members to assign enough time for knowledge sharing activities. This is one of the biggest challenges. The criticism towards these practices in previous research is that they are time consuming and inefficient (e.g. Keegan and Turner, 2001; Shokri-Ghasabeh and Chileshe, 2014; Hartmann and Dorée, 2015). By utilizing time on knowledge sharing during the project, the risk of losing use knowledge from the project increases which results in raising the probability of repeating the same error and mistakes (Busby, 1999; Smith, 2001; Thomas, 2014). Although time is the most influential factor for the efficiency of knowledge sharing, there are other factors to affect the ability of team members to share knowledge. Following are the influential factors for knowledge sharing in PBOs:
6.5.1 Recruitment Selection
As mentioned above, there is a specific recruitment criterion in Zemax: they only hire people who enjoy and are willing to share knowledge. This means company wants to radically reduce the probability of the occurrence of bad influence which is caused by a performance climate through recruitment, in order to support knowledge sharing. According to Robertson et al. (2003), the recruitment for expertise should provide a baseline level of normative congruence with the firm’s values. This could explain why Zemax are looking for employees who are full of helping behaviors, and this alignment with the firm’s knowledge-sharing values not only ensures successful knowledge sharing, but also ensures new members are intensively exposed to the firm’s working practices.

Likewise, Swart and Kinnie (2003) deem that employees are recruited not only for their know-how, but also because they are suited with the firm and its knowledge sharing attitude. Zemax fully implements this principle. This company uses recruitment policies to create a positive knowledge sharing environment, and tries to avoid the bad outcome at the same time. Obviously, the good implementation of the recruitment policy provides the ideal environment for knowledge sharing: everyone in the project team has a strong willingness to share knowledge, and they express joy from their knowledge sharing; nobody will hide or conceal knowledge for private reason, even if they are under several performance evaluations or assessments.

6.5.2 Time
Apart from those helping factors, there are still some negative factors imposing restrictions on knowledge sharing under performance climate. Firstly, time, based on interviewees. When team members spend more time to stay together, the opportunity to share knowledge increases. This is because longer time increases interaction which leads to more frequent communication, and frequent communication provides more knowledge sharing opportunities, finally leading to positive knowledge sharing environment even if under a performance climate. However,
project team members are reluctant to spend time on knowledge sharing, due to the heavy task. According to Husted and Michailova (2002), employees have faith that the limited time should spend on what they perceive to be more productive activities, especially under the social comparison and intra team competition environment. In this case, heavy tasks basically occupy all time during work, which means less time could be used in knowledge sharing. Meanwhile, although technology simplifies the task and reduces the time necessary for knowledge sharing with others, it could not relieve the lack of time.

Project team members in this Zemax generally lack time to share knowledge, and also lack time to identify which kind of knowledge their colleagues require. Several scholars have highlighted the lack of time as a common influence factor for knowledge sharing, and team members often struggle to implement knowledge sharing due to time constraints. Project team members have strong aspiration to share knowledge with others, and they want everyone in the team have sufficient knowledge to deal with task in order to reduce the heavy workload and speed up the whole task. However, the heavy workload cannot allow team members to share knowledge as much as they want, and ultimately increases the amount of work, just like an endless loop.

Consequently, it is important that PBOa offer enough space to allow team members to take time to share knowledge during project work, particularly those team members who have high willingness to share knowledge with others.

6.5.3 Infrastructure of organization
Besides time, infrastructure is another factor which influences knowledge sharing. In this empirical study, project team members discuss and work in the same room. Indeed, working, discussing, and talking with each other in the same room is convenient for knowledge sharing. However, disturbance and distraction cannot be avoided under this kind of circumstance, even if they talk in a very low voice. Therefore, project team members want to have an exclusive
room or place for knowledge sharing. According to Gold et al (2001), absence of infrastructure could lead to the failure of knowledge sharing. Unfortunately, due to unavailability of enough room and high security standards, it is hard to provide extra rooms for project team members. On the contrary, providing an appropriate and sufficient infrastructure resource could facilitate knowledge sharing with project teams (Coleman, 1999; Schlegelmilch and Chini, 2003).

6.6 The reason to share knowledge between team members

There is need to recognize the factors that why project team members may decide to share knowledge for various reasons in organization. For instance, as we discussed earlier, empirical case study has shown that the individuals may share knowledge because they like help each other or empower other team’s members to solve problems. Similarly, below mention are some of the factors which may trigger the knowledge sharing behaviour in PBOs.

6.6.1 Organizational culture

Findings from this research indicate that in Zemax, there is a kind of organizational culture to support or force team members to share knowledge with each other. The knowledge sharing culture mainly shows as the willingness of team members to help others, which has already discussed before. This culture advocates team members to be active in sharing knowledge, for example, team members are willing to offer expertise and advice through improved task among team members. According to Taylor and Wright (2004), this type of culture which focuses on learning and sharing is positively related to effective knowledge sharing. Based on that, it is suggested that to improve knowledge sharing, company needs to develop their culture to encourage or improve team members’ willingness to share knowledge or to help others. From this perspective, ensuring efficient knowledge flows among different project team members through enhanced organizational culture would become a way. This is one
reason that there is an efficient knowledge sharing in Zemax, even if working under performance climate.

6.6.2 Team characteristics
Based on the findings, an interesting team characteristics shows up. It appears that project teams are trying their best to promote themselves to be more active in knowledge sharing area, which based on their helping behavior. This unique team characteristic derives from the standards of recruitment, which has been discuss in section 5.4.1. Wang and Noe (2010) deem that team characteristics impacts knowledge sharing among team members. In Zemax, the communication styles between team members have improved the positive association with knowledge sharing. Due to this team characteristic, team members not only focus or response for their own careers, but also concern the situation of their colleagues. This decreases the individualization inside PBO, which shows an opposite result of study Borg and Söderlund (2013). It is also notable that many of the team members are not performed rivalrous and their need for knowledge sharing is apparent. This shows a positive correlation among team’s members, and is proved by the willingness to help and facilitate each other, which has consistent with past research Beersma et al. (2013). Previous researches have tended to offer some different descriptions of the improvement of knowledge sharing. For example, for the competition and cooperation, the real trigger of the efficiency knowledge sharing has still been discussed. In Zemax, the cooperation implies that the willingness to help each other is the main reason to achieve a high efficiency knowledge sharing, which means the cooperation is the right trigger for knowledge sharing, even if under a performance climate.

In addition, some team members mention that every team member wants to contribute to the team’s ability to continue as a working unit, which means that a high level of team cohesiveness is inside Zemax. This high standard cohesiveness also improves team members to share more knowledge (Bakker et al., 2006; Sawng, Kim, and Han, 2006).
6.6.3 Diversity
The findings of the case provide strong evidence to show the diversity in the project teams. Based on Ojha (2005), those team members who consider themselves as a minority group, based on gender and education issues, are less likely to share knowledge with team members. This means that socially isolated members are more likely to share their unique knowledge within project team (Wang and Noe, 2010). In particular case of Zemax, the diversity of aging among team members is the determine as a reason to decide how much knowledge will be shared. Older people have more experience or knowledge than younger team members, and they also feel a responsibility and obligation which only existing inside Zemax: it is the duty of older people to share their own knowledge with young team members. Thus, the older people will share their knowledge if someone requires. Although young members are the major group in project team and they also have high willingness to share knowledge, the lack of expertise and experience restricts their knowledge sharing. This turns to an opposite results of Phillips, Mannix, Neale, and Gruenfeld (2004) and Thomas-Hunt, Ogden, and Neale (2003), which believe the majority would share more knowledge in the team.

6.6.4 Evaluation apprehension
As discussed in the previous chapters, Zemax is a performance climate and performance assessments are the common evaluation way in company. Following to those previous researches, such as Bordia et al. (2006) and Judge, Bono, and Locke, (2000), they believe that the fear of evaluation apprehension would prevent knowledge sharing through the self-evaluation, and the self-evaluations influence knowledge sharing. According to their opinion, the knowledge sharing in Zemax would be inhibited by those evaluations. However, the knowledge sharing is still active enough, and the team members are not fear with the evaluation even if it relates to one's self-evaluation (Bordia et al., 2006). Actually, project team members are in favor of performance assessments which are held by company. They could feel that assessments have facilitated, improved and supported the knowledge sharing, and those assessments also improve team members’ ability.
6.7 Methodological issues in knowledge sharing research

Nearly one third of studies included in this research were qualitative studies which have used the observations, interviews archival and documents analysis to answer their research questions. Few number of qualitative studies also collected quantitative data for analysis. One of the important strength of the reviewed studies was that the majority of them were conducted in field settings. Thus, the qualitative studies provided the rich and in depth understanding of organizational context in which knowledge sharing has occur. Still more qualitative research is needed to help us better design quantitative studies. For example, it will be help to know more about the role of managers and their behaviour for knowledge sharing in performance climate and how they deal with issues in performance climate.

6.8 Further Discussion

The main objective of this study is to investigate the influence of performance climate on knowledge sharing in PBOs. Although previous research has highlighted the importance of performance climate on knowledge sharing such as Cerne et al., (2013) and Wang and Noe (2010), few studies systematically examine the factors which can influence by the performance climate specifically in PBOs for knowledge sharing. The results from the empirical research contribute to identify the factors which can trigger the knowledge sharing activities even in the presence of performance climate by showing examples from the sample company.

The answers of the selected interviewee (see chapter 5) shows the positive influence of performance climate on knowledge sharing in PBOs. However, there are several implications that we can drawn here the consequent finding and in the light of existing literature presented in this research about knowledge sharing, performance climate and PBOs. First, a context which support trust and emphasize socialization is favourable to knowledge sharing (Chow and Chan, 2008). It is clearly apparent that organizational context is important and thus it has
the ability to directly impact the team members’ behaviour for knowledge sharing as well as indirect effect through performance climate.

Secondly, although the role of the project manager is not very dominant in the above mentioned case, research has shown that the project managers and supervisors’ support is very important for effective knowledge sharing initiatives. Organizations can set up rewards for managers to support and encourage knowledge sharing within their project teams. According to Teo (2005), management can support knowledge sharing by emphasizing on lessons learnt rather than mistakes made by team members.

Thirdly, recruitment in PBOs should be required to find those individuals who can identify knowledge sharing obligations and responsibilities by means of socialization, once the formal employment relationship has been established. This means that the team members who work inside PBOs should have a positive outlook on knowledge sharing, which is aligned with the goal of organization. Through the recruitment of socialized behaviour inside PBOs, a strong sense of knowledge sharing has prevailed in organizations (Swart and Kinnie, 2003). The strong sense can create and strengthen an environment, where a common understanding about the importance of knowledge sharing is facilitated and established. However, this can underpin knowledge sharing and counteract the negative effect caused by a performance climate in the organization.

Fourthly, due to the recruitment of social behaviour, every project team member wants to learn new knowledge or lessons from each other. Asking questions to team members grows to be a customary condition in their daily task routines. This is because of the reason that they know all the team members in their project team and likes to socialize with each other and they do not get disturb from asking each other's help. Team members also do their learning in all aspects, including project meetings, project discussions, project presentations, daily reports, and even a short coffee break. Thus, it could be said that this learning embeds knowledge sharing into their organizational routines. In addition, empowering project team members is
also a daily task that organizations can do in order to reduce workload. Full assessment of information and comprehensive supporting can be found everywhere (Morgan Tuuli et al., 2012), for example, team members can get knowledge from sufficient sources, and organizations also provide different supplementary methods (intranet system) to help team members acquire knowledge. These two ways not only enhance the psychological and political power to share knowledge, but also shape team members’ attitudes towards knowledge sharing. Besides that, project team members process a feeling of strong eagerness to help others, which is supported by recruitment. In other words, they are fond of teaching others and solving others’ problems. This helping behavior exists everywhere, generally becoming the organizational routine. More helpful and useful knowledge appears through helping others in various occasions, such as in normal discussions, regular meetings, private conversations, formal conference and so on. Project team members also enjoy sharing knowledge in an effort to help others, which means knowledge sharing could be raised simply through the helping.

Research suggests that it is crucial to design knowledge sharing initiatives which are aligned with routines and existing working habits of team members which can link the knowledge sharing to company values and goals (Wang and Noe, 2010). However, according to our conceptualization, in the case of knowledge sharing in PBOs, the performance climate is likely able to track the record of project team member’s knowledge sharing behaviour. Thus, it might be possible for organizations to keep weight on negative aspects of performance climate by establishing helpful knowledge sharing routines in the organizations (as we analyzed with the example of case company). In this way, project team members do not need to spend extra time on knowledge sharing activities and can relax with project deadlines. Moreover, if organizations implement knowledge sharing activities as a separate task or activity, chances are that the project team members might experience stressed due to extra work and anxiety of adapting a new strategy (Bartol and Srivastava, 2002).
Authors of this research presented a model in figure 11 which demonstrates that how PBOs can implement the knowledge sharing activities into organizational routines to avoid the challenges like time limitation. This model further states that organizations can embeds socialization and communication activities in their everyday task to enhance sharing in their employees which eventually develop willingness to share knowledge and resulted them in long time knowledge sharing behaviour.

*Figure 11: Framework for knowledge sharing under performance climate in PBOs*

Examining knowledge sharing under performance climate in PBOs offers important implications for future research on organizational routines. Inside the organizations, knowledge sharing involves systematic learning which can only be established in the organizational routines. From the existing literature, Nelson and Winter (1982) argue that the organizational routines are the essence of that organizational learning would be expected to occur when organizations decide to develop “adaptation routines” which can allow the organization to continuously modify the existing routines based upon new knowledge. Grant (1996a) defines learning routines as regular patterns of interaction between individuals which
exhibits the transfer, recombination or creation of specialized knowledge. However, there is a very limited number of research that suggests how organizations can develop such routines that facilitates the knowledge sharing among team members. There are few researchers that stated that informal meetings, coffee breaks, workshops and social networks are some of the excellent means to share knowledge (Wiewiora et al 2009) and can be considered as one aspect of organizational routines. Future studies can extend the theoretical preposition of this research to study the knowledge sharing in strategic alliance with the organizational routines.
7. Conclusion

The last chapter provides a conclusion of the whole study and presents an understanding on how performance climate influences knowledge sharing in PBOs. Additionally, the theoretical contribution of this master thesis is going to be explained. Suggestions for further research in this field will also be discussed.

The main purpose of this study is to enhance the understandings of the working situation in PBOs and issues inherent in performance climate, particularly regarding effective knowledge sharing among project team members. Such kind of understanding is important to improve the effectiveness of knowledge sharing which is typically important in high technology and complex problem solving industries. Although the influence of performance climate on knowledge sharing has already been explored by several scholars, such as Cabrera and Cabrera (2002), Perry-Smith (2006) Wang and Noe (2010), Cerne et al. (2013), and Sergeeva and Andreeva (2016). This research study argues for the need of more research has to be done on performance climate and linkages with Project based organization with respect to project team members.

Based on our empirical study our research contributes to effective knowledge sharing in PBOs and performance climate in several ways. First, the authors provide the overview of empirical contexts which has been discovered in extent to knowledge sharing, identifying holes and gaps for future research and highlighting biases in particular area. Secondly, the authors of this study demonstrate that the context for knowledge sharing has been insufficiently presented in already existing literature. Finally, study is going to design and contribute to theories about employees for knowledge sharing under performance climate in PBOs. With this purpose, this study builds reasoning that would confirm the ideas of Cerne et al. (2013) who claim that performance climate influences knowledge sharing. It also supports the ideas of Ajmal and Koskinen (2008), Eskerod and Skriver (2007), who admit that time has a strong
relationship with knowledge sharing inside PBOs. In addition, the challenge of knowledge sharing which are mentioned by Connelly et al. (2011) and Ruuska and Vartiainen (2005) turn to be an evident lesson in implementation of knowledge sharing under performance climate in PBOs.

Therefore, this study has certain limitations as it focused on selected number of articles. Several articles focus on knowledge management issues (e.g. Amjal and Koshien, 2008) and therefore naturally including knowledge sharing literature. Hence, authors reviewed the articles with same research question in mind and found similar trends with respect to context of performance climate as described in previous chapters. Nevertheless, the authors of this research believe that this limitation will not alter the results and implications of this study.

7.1 Theoretical contribution

Generally, this thesis provides three theoretical contributions in several ways. Firstly, through analyzing theoretical and empirical data, it is possible to provide the answer to the research question: “How does the performance climate influence knowledge sharing in PBOs?”. The findings of this study explained that a performance climate could have a positive influence on knowledge sharing in PBOs, as long as companies has sustainable solutions. Using technology and face to face meeting could counteract the opposite effect. The mitigation of these influences imply that the side effect of performance climate could be reduced. Thus, companies could minimize the harm fundamentally through recruitment or by hiring people who have a high willingness to share. It turns to be a visible result that knowledge sharing under performance climate is still affected and efficient, even though several negative factors hinder it. Likewise, knowledge sharing will require more time to be sufficiently put in practice. Time is the main limiting factor for knowledge sharing under performance climate, as has been described in the analysis.

Meanwhile, after the research question is answered, the authors take a further step and draw the implications of knowledge sharing. Contemplating the knowledge sharing from the
perspective of organizational routines sets the possibility to recognize interrelationship between the knowledge sharing and performance climate inside PBOs. A model turns to be visible that reflects on knowledge sharing in strategic alliance with the organizational routines which adapts the performance climate in PBOs. Generally, this model could be widely used in practice, and this could further contribute to the understanding of knowledge sharing in the academia area.

Secondly, after the research question is solved, it is possible to take further investigation in performance climate. The result of this study sheds light on the positive effects of knowledge sharing in PBOs in a performance climate, which means performance climate could enhance and improve knowledge sharing to some extent. Thus, this study draws a different implication of performance climate. Furthermore, this research indicates that PBOs can have smooth and successful knowledge sharing even under a performance climate. Creating awareness in what a PBO can do to improve knowledge sharing from preventing the disadvantage of performance climate points out a new way for the management level of PBO. In addition, this company could become an example for others PBOs which have similar targets or which have similar organizational climate. This research also provides a different view on knowledge sharing in PBOs, which is combining knowledge sharing and organizational routines. In fact, it allows to get closer towards exploring how knowledge sharing counteracts performance climate. However, this also makes it possible for management to adopt new organizational routine in future for efficient knowledge sharing.

Finally, the answer of this research suggests that there are large opportunities to explore existing studies from different views, some of which can be the subject for future research. All in all, this research could further contribute to the understanding of knowledge sharing under performance climate in PBOs in the academic world.
7.2 Further Research

This study has researched how performance climate influence knowledge sharing in PBOs of single company case. Therefore, the findings only apply for this company. It should be revealed in more companies to prove that those findings could be extensively used. Therefore, replicating the study in more companies can be an opportunity for further research. Through those companies, enough evidence could be used to improve or criticize the existing findings. Moreover, it is argued that the understanding of performance climate is quite tight with this research. This is because the judgement of the performance climate is not clear enough, although Perry-Smith (2006), Cerne et al. (2013), and Sergeeva and Andreeva (2016) have already discussed it. This leads to a suggestion that more research on performance climate is needed. Finally, it is also important to mention that the study suggested that the knowledge sharing is two processes among project team members, and there are different views on knowledge sharing. Following this it is interesting to explore more the other view of knowledge sharing. This could provide a wider understanding of the research question.

In brief, it would be interesting to see future research in this area of performance climate and knowledge sharing inside PBOs specifically with the project manager’s behaviour. Following this, it is interesting to explore more PBOs in a variety of industries. This should contribute to the understanding of common answers on how a performance climate influences knowledge sharing in PBOs.
8. Reference


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Schmickl, C. and Kieser, A. (2008), "How much do specialists have to learn from each other when they jointly develop radical product innovations?", *Research Policy*, vol. 37, no. 3, pp. 473-491


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Appendix 1: Interview questions

Aim of interview: To understand the organizational climate, to find the reason of its influence.

Name: Position:

Background questions:

1. Would you like to introduce yourself and your professional background (in short)?

2. How long you have been working in this organization?

3. Can you describe your main duties and responsibilities within your specific role?

Interview questions:

1. How would you describe the working atmosphere in your project team?

2. Do you see any particular advantages or disadvantages of your company’s climate?

3. How would you say that the organizational climate of Combitech supports knowledge sharing? - If yes, why? - If no, why?

4. If project team members find that they are lacking knowledge, where could they find help?
5. Do you think all of your team members participated equally in projects teams or some are more dominant than others? And why?

6. When you work in the project team, are there anything to hinder and facilitate you to share knowledge? If yes, what are they? If no, why?

7. What is your opinion about assessing individual’s performance with respect to coworkers in your organization?

8. How often do you assess with respect to co-workers during your project?

9. Do you think above mentioned kind of system effect the knowledge sharing activity in your teams because individuals might feel insecure, due to lose their own ideas?

10. What are you prefer means to share knowledge with you project team members?

11. What are the challenges you face specifically in your project teams for knowledge sharing?

12. In your opinion what are the most important factors behind above mentioned challenges?

13. How would you describe the role of line managers to resolve challenges and increase the efficiency of knowledge sharing? E.g provide more opportunities for socialization

14. Do you ever experience big changes in your organization which facilitates knowledge sharing in project teams e.g increase number of coffee breaks, flexible project deadlines, time relaxation or changes in job design etc?

15. What really motivates you share knowledge with your project team members?
16. Before we end, is there anything else you would like to add about any interesting incident or activity about knowledge sharing?
## Appendix 2: Theoretical framework Summary

<table>
<thead>
<tr>
<th>Author(s), Year and Title</th>
<th>Methodology</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sergeeva and Andreeva (2016) Knowledge Sharing Research: Bringing Context Back In</td>
<td>Conceptual framework to discuss knowledge sharing theory and the several practice ways.</td>
<td>The study provided an overview of the empirical contexts that have been covered in extant knowledge sharing research.</td>
</tr>
<tr>
<td>Söderlund (2015) PROJECT-BASED ORGANIZATIONS what are they?</td>
<td>Case study method was utilized by interviewing the CEO of that company.</td>
<td>This chapter points that author responds to coordination and cooperation complexity into types of PBOs.</td>
</tr>
<tr>
<td>Cerne et al. (2013) WHAT GOES AROUND COMES AROUND: KNOWLEDGE HIDING, PERCEIVED MOTIVATIONAL CLIMATE, AND CREATIVITY</td>
<td>A comprehensive data analysis research of two studies. The first one was collected from 240 employees and their 34 direct supervisors in two Slovenian companies. The second one conducted an experiment with 132 second year undergraduates in an HRM course at a Slovenian university, which used to address the limitations of first study.</td>
<td>When a coworker is denied knowledge he or she needs to be creative, this person is likely to reciprocate by hiding knowledge from the initial knowledge hider. This behavior would successively impede the knowledge hider's creativity, as both of our studies support.</td>
</tr>
<tr>
<td>Santos, Soares and Carvalho (2012) Information Management Barriers in Complex Research and Development Projects: An Exploratory Study on the Perceptions of Project Managers</td>
<td>An approach of conceptual overview was adopted. This study tried to summarize previous finding based on literature review.</td>
<td>This study derived several implications for the practice and wider disciplines of information management and project management, such as information overload, dispersion of information and so on.</td>
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<tr>
<td>Agarwal, Mohammed and Thatte (2011) Motivation and Knowledge Sharing: Role Of Perceived IT Support</td>
<td>A cross-sectional survey design method is used to test the model and the hypothesized relationships. Large scale data collection was preceded by pre-test and a pilot survey from 53 responses obtained out of the 68 survey requests to assess the measurement instruments.</td>
<td>The relationship between intrinsic motivation, perceived IT support and their impact on knowledge sharing in manufacturing firms.</td>
</tr>
</tbody>
</table>
Alekseev(2010a)  
Knowledge Management in Project-Based Organizations: The Success Criteria and Best Practices

- Mix methods approach is useful to cover strong aspects of both quantitative and qualitative approaches. Quantitative method is selected as dominant.

1. Through organization of outsourced training and common activities between project teams, organizations appear to be are able to bring in new knowledge from outside or to create it inside of the organization.
2. An open problem-solving atmosphere, which could be created by application of brainstorm sessions and openness of upper management, is a positive influence in acceptance of change among employees.
3. KM can reduce project time, increasing product quality and avoiding making same mistakes.
Appendix 3: Primary Results

Aim of interview: To understand the organizational climate, to find the reason of its influence.

Name: 

Position: 

Background questions:

1. Would you like to introduce yourself and your professional background (in short)?
2. How long you have been working in this organization?
3. Can you describe your main duties and responsibilities within your specific role?

Interview questions:

1. How would you describe the working atmosphere in your project team?

   ● Team based
   ● Communication
   ● Meeting everyday

2. Do you see any particular advantages or disadvantages of your company’s climate?

   Advantage:
   ● Easy to approach
   ● Helping behavior
   ● Save time

   Disadvantage:
- Noisy
- Hard to focus on work due to communication
- Disturbance of workplace

3. How would you say that the organizational climate of Combitech supports knowledge sharing? - If yes, why? - If no, why?

- Yes
- Creating opportunities for knowledge sharing
- Different training and development courses
- Recruitment process
- Encourage different age

4. If project team members find that they are lacking knowledge, where could they find help?

- Asking team members
- Intranet
- Line managers for other questions
- Morning meeting
- Course training

5. Do you think all of your team members participated equally in projects teams or some are more dominant than others? And why?

- Equally 5 interviewees
- Dominate 4 interviewees
6. When you work in the project team, are there anything to hider and facilitate you to share knowledge? If yes, what are they? If no, why?

- No hider issues

7. What is your opinion about assessing individual’s performance with respect to coworkers in your organization?

- Assessing is good (80%)
- Assessing is not good (20%)
- The sprint retrospective
- Helping behavior

8. How often do you assess with respect to co-workers during your project?

- Monthly based
- Every third week

9. Do you think above mentioned kind of system effect the knowledge sharing activity in your teams because individuals might feel insecure, due to lose their own ideas?

- Yes, it is good for knowledge sharing.

10. What are you prefer means to share knowledge with you project team members?

- Communication
- Intranet, wiki-page
- Formal meeting
11. What are the challenges you face specifically in your project teams for knowledge sharing?

- Time
- Infrastructure
- Level of knowledge
- How to train new team member to get new knowledge

12. In your opinion what are the most important factors behind above mentioned challenges?

- Project deadline
- Management process

13. How would you describe the role of line managers to resolve challenges and increase the efficiency of knowledge sharing? E.g provide more opportunities for socialization

- Line manager is generally important.
- Not very providing something in this company
- They generally motivate in employee

14. Do you ever experience big changes in your organization which facilitates knowledge sharing in project teams e.g increase number of coffee breaks, flexible project deadlines, time relaxation or changes in job design etc?

- Helping each other
- Willingness to share knowledge
- Empowering team member to reduce workload

15. What really motivates you share knowledge with your project team members?
- Align transformation for new knowledge
- Recruitment process (only hire knowledge sharing people)

16. Before we end, is there anything else you would like to add about any interesting incident or activity about knowledge sharing?