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Knowledge sharing in a Dutch hospital

An empirical study
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Abstract

This thesis examined how frequency of communication, trust, shared values and the use of IT-tools influence the level of tacit and explicit knowledge sharing within a Dutch hospital. Using data gathered by questionnaires and semi-structured interviews within a medium sized Dutch hospital. A number of 122 respondents, employed across the entire organization, were included in this research. A significant effect of trust on knowledge sharing is found, indicating that the higher the level of trust amongst colleagues, the higher the level of knowledge sharing amongst those colleagues will be. For the other antecedents included in this research no significant effect was found. Even though, except for trust, no significant effects were found for the included antecedents, the hypothesized relationships should not be ruled out yet. Limitations concerning the response rate and the ambiguous concept of knowledge sharing might have influenced the results of this research. Therefore, it is recommended to execute a somewhat similar research with some slight alterations. Overall, this research emphasizes the ambiguity of the concept knowledge and points out the importance of a focus on a high level of trust and motivation within an organization, when willing to increase the amount of knowledge which is shared.

Keywords: Knowledge Sharing, Frequency of Communication, Trust, Shared Values, Information Technology-tools.

Preface

In order for me to finish the last chapter of my life as a student, I had to write a master thesis for the Extended Master Organization Studies at the Tilburg University. Almost one year ago I started with this step. At that time, I was looking forward to gain new knowledge but still unsure about the research I would like to perform. I could do my research within an organization at which I was doing a traineeship at the same time and chose to first take some time to get to know the organization. By doing so, I discovered several topics which could use some research and I chose to focus on knowledge sharing within the organization. I enjoyed the combination of doing scientific research and working within the same organization on a daily basis, it enabled me to commit to my research because I saw that the organization could benefit from some in depth understanding of knowledge sharing.

Several people surrounding me, helped to make the process of writing this master thesis as smooth as possible. First of all, I would like to thank Merijn Mulders, for providing me the opportunity to participate in this traineeship, for his trust in me, his support and his critical and challenging attitude towards me and my work. Also, I would like to thank Nicola Stanczyk for her feedback and help during the statistical analysis of this research; you were of great help to me. Next, I would also like to thank Pleuni de Groot who was willing to give feedback and help brainstorm during the start-up phase of this research. Adding to this, I would also like to thank my academic supervisors Rob Pranger and Sander Smit who helped me out when needed, and guided me through the process of writing this Master thesis. Their extensive feedback kept me critical and helped me to get the most out of my thesis. Additionally, Evgenia Dolgova as the second reader and Luc van Baest as the MTO evaluator, thank you for your help bringing this research to a higher level by asking critical questions and providing suggestions to further improve the research.

Besides the assigned supervisors, I would also like to thank my fellow trainees for reading earlier drafts of my thesis and providing them with feedback. Especially I would like to thank Alina Mogutchikh who was always available to brainstorm about my research or any other topic that was on my mind and who acted as my personal spelling and grammar tutor. Furthermore, without the contribution of the respondents it would not have been able to execute this research. Therefore I would also like to thank all respondents for their openness and honesty when answering the questionnaires and during the interviews. Last, my thanks go to all the people from my inner circle, especially Noah Patty, who always was willing to structure my thoughts and helped me to keep motivated.

Enjoy reading my thesis!

Anouk Lelkens

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1. Problem statement

The Dutch government has strived and succeeded to increase the level of competition amongst Dutch hospitals (Bal, 2008). As a result hospitals and hospital employees are experiencing an enormous pressure to deliver high quality work for the lowest possible price without compromising patient safety (Bal, 2008). This pressure emphasizes the need for efficient mechanisms to maintain competence and a competitive advantage (Wiemken, Ramirez, Polgreen, Peyrani & Carrico, 2012).Contemporary literature identifies several factors that increase the performance and competitive advantage of an organization. For example employee job satisfaction (Dorrws & Lee, 2013), organizational structure (Hao, Kasper & Muehlbacher, 2012), and the focus of organizations on corporate social responsibility (Buciuniene & Kazlauskaite, 2012) are found to increase the competitive advantage of the firm. Next to these factors, an emphasis on knowledge sharing between colleagues has sparked a recent interest in performance implications of organizations (Becerra-Fernandez & Sabherwal, 2001; Hsu, 2006; Lee & Choi, 2003; Wide´n-Wulff & Soumi, 2007 in Hsu, 2008). Wang and Noe (2010) define knowledge sharing as 'sharing task related information and know-how to help others and to collaborate with others to solve problems, develop new ideas, or implement policies or procedures' (Wang & Noe, 2010, p.117). Wen (2009) mentioned that the sharing of knowledge is more often being recognized as an important factor for organizations in gaining a competitive advantage. In line with this statement Chang, Huang, Chiang, Hsu and Chang (2012) found that knowledge sharing grants employees access to relevant information and enables them to build and use knowledge networks within organizations. These results stress the importance of knowledge sharing for organizations.

Within hospitals knowledge sharing happens a lot in order to function. For example the sharing of knowledge concerning patients and their treatment can literally be a matter of life and death. Nonetheless, up to now relatively little is known about knowledge sharing and antecedents of knowledge sharing within Dutch hospitals. Chang, Huang, Chiang, Hsu and Chang (2012) state that Dutch hospitals are known to be knowledge sensitive and complex. An example of this complexity is the fact that employees, especially nurses and outpatient clinic-assistants, often work on several departments or for a variety of specialisms. Next to this complexity, Dutch hospitals are subjected to financial and staffing cutbacks, increasing pressure on its staff and the organization. Both phenomena increase the complexity of this sector and possibly reduce the, by the employee perceived time to share knowledge. Illustrative, Jensen and Meckling (1992) have already described how employees moving within a complex organization are limited by their own mental and communicative abilities which could make it more difficult to gather and share all the right knowledge. Several dimensions of knowledge sharing can be found within the contemporary literature. Often a distinction between tacit and explicit knowledge is made (Klein, 2008). This distinction will also be used in this research. Tacit knowledge is defined as 'knowledge that is hard to articulate or can only be acquired through experience' (Renzl, 2008, p.210). Because tacit knowledge is hard to codify and therefore difficult to share, tacit knowledge distinguishes organizations from one another (Griffith & Sawyer, 2010). Therefore, tacit knowledge can provide organizations with a competitive advantage which cannot be easily imitated by rivals (Hu & Randel, 2014). Explicit knowledge is defined as "knowledge codified and transferable in formal systematic methods, such as computer programs, codified work procedures, customer databases, and

company rules and policies" (Hu & Randel, 2014, p.224). According to Griffith and Sawyer (2010) explicit knowledge can be transmitted, for example, via face-to-face training, informal meetings, email, and/or custom designed technology management systems.

In order to increase the sharing of knowledge within an organization it is important for the organization to understand underlying factors regarding knowledge sharing. A key factor facilitating the level of knowledge sharing within an organization is the knowledge sharing infrastructure. Implementing a better and more professional knowledge and data sharing-infrastructure such as an Electronic Health Record (EHR) is a hospital-wide measure which many Dutch hospitals have turned to (Van Dorresteijn, 2014, april 10). The term of an Electronic Health Record describes the concept of a comprehensive and longitudinal collection of a patient's health and healthcare data (Hoerbst & Ammenwerth, 2010).

The contemporary literature describes many other factors known to influence tacit and explicit knowledge sharing. For example, trust amongst colleagues (Renzl, 2008; Lee, Gillespie, Mann & Wearing, 2010; Chang, Huang, Chiang, Hsu & Chang, 2012; Panahi, Watson & Partridge, 2013; Li, Poppo & Zhou, 2010), the frequency of interaction amongst colleagues (Van den Hooff & Huysman, 2009; Radaelli, Mura, Spiller & Lettieri, 2011; Yu, Hao, Dong & Khalifa, 2013; Chang, Huang, Chiang, Hsu & Chang, 2012; Hu & Randel, 2014), shared values amongst employees (Chang, Huang, Chiang, Hsu & Chang, 2012; Yu, Hao, Dong & Khalifa, 2013) and information technologies (Ali, Whiddett, Tretiakov & Hunter, 2012; Eid & Nuhu, 2011). In order for Dutch hospitals to increase knowledge sharing within the organization, they should focus more on these known factors influencing knowledge sharing. Although a better understanding of these factors might be necessary.

Since demands for quality and safety increase the need for knowledge sharing, an insight in the way in which knowledge is shared and used within a Dutch hospital is necessary. The aim of this thesis is to determine the extent to which the factors mentioned above influence the level of knowledge sharing within a Dutch hospital. This thesis expects that results concerning knowledge sharing in a hospital context will deviate from the current literature on knowledge sharing in organizations. The main reason for this is the fact that Dutch hospitals have a more than average level of complexity, as was mentioned before. Investigating knowledge sharing in a Dutch hospital context is likely to add to the existing literature in novel ways by delivering a study with a comprehensive view on knowledge sharing within such a dynamic and knowledge intensive environment. The research question of this thesis will be:

'To what extent do the use of IT-tools, the level of trust amongst colleagues, the level of shared vision amongst colleagues and the frequency of communication amongst colleagues influence the level of both tacit and explicit knowledge sharing amongst employees? '

2. Theoretical background

This following chapter explains the theories and concepts which are central to this thesis. Also, the different variables of the conceptual model (below) are discussed in this section. An operationalization table can be found in appendix 1.

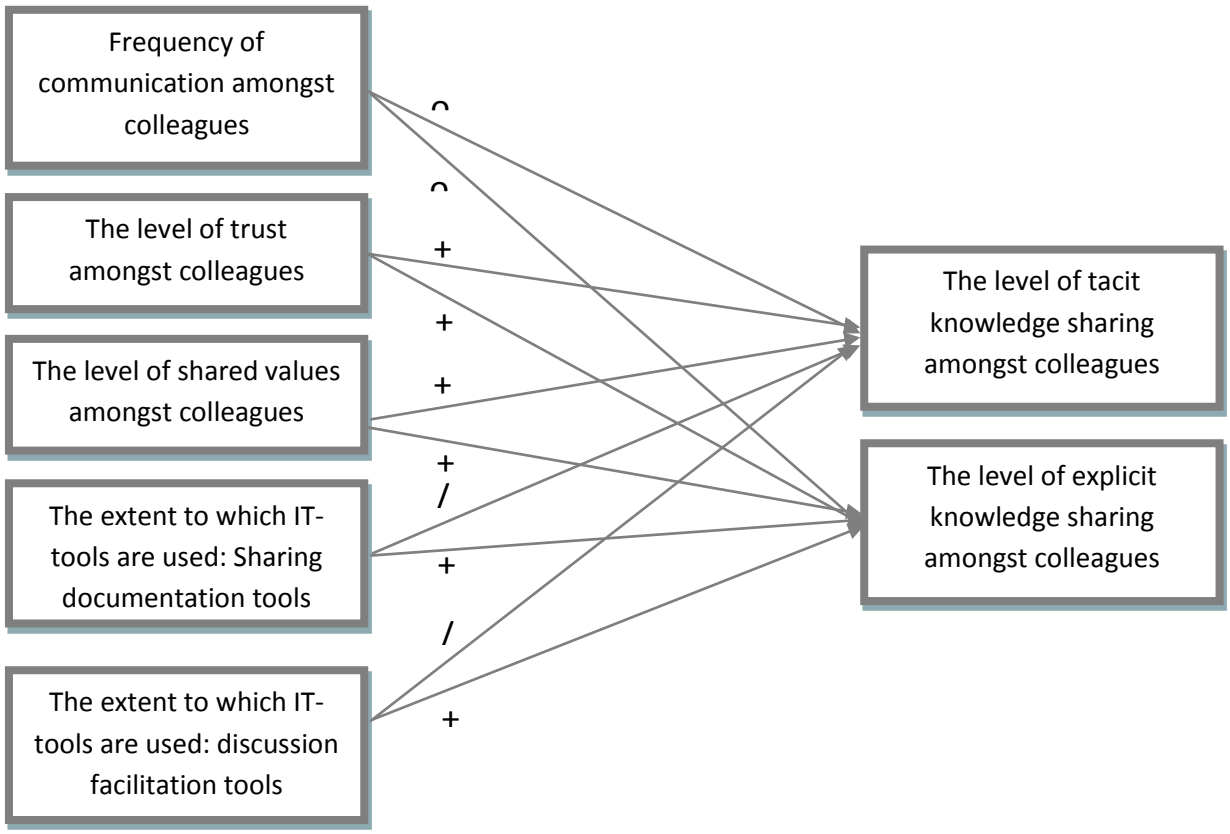

Figure 1 Conceptual model, loosely based on Van den Hooff and Huysman (2009)

2.1 The level of knowledge sharing amongst colleagues

The concepts information and knowledge are often used interchangeably in the literature (Ipe, 2003). Tsoukas and Vladimirou (2001) state that what differentiates knowledge from information is that knowledge in contrast with information, presupposes values and beliefs, and is closely connected with action. In line with this, in his paper Ipe (2003) explains how information is seen as a flow of messages and that knowledge is created when there is an interaction between individuals' beliefs and commitments and these messages. Thus in order to create knowledge it should be shared between employees. Wang and Noe (2010, p. 117) define knowledge sharing as 'the provision of task information and know-how to help others and to collaborate with others to solve problems, develop new ideas, or implement policies or procedures' and can occur via face-to-face communication, written correspondence or by documenting and capturing knowledge for others (Wang & Noe, 2010). This definition by Wang and Noe (2010) will be used in this research.

A distinction can be made between knowledge sharing and the transfer of knowledge. A knowledge transfer implies a clear aim while the sharing of knowledge may happen in unintended ways without a specific aim (King, 2006 in Klein, 2008). Worth mentioning, this research focuses on the level of knowledge sharing amongst colleagues, which means all employees within the organization and not just direct colleagues which are working in similar departments as the

respondents. The researcher chose for this approach since by doing so there is one clear definition of colleagues, some employees work in several departments which makes it difficult to determine who are and who are not direct colleagues. Next to that the level of analyses in this research is the individual. By choosing a different definition of colleagues a distinction in departments is made.

In the contemporary literature on knowledge sharing a distinction between tacit and explicit knowledge is often made (Klein, 2008). Tacit knowledge is defined as 'knowledge that is hard to articulate or can only be acquired through experience' (Renzl, 2008, p.210). Hu and Randel (2014) expanded this definition stating that tacit knowledge is "the knowledge which is very difficult to articulate, formalize and communicate, such as technical know-how, tactics for market promotion, managerial techniques, and the way people do things in the company (corporate culture)" (Hu & Randel, 2014, p. 224). In line with this definition, Griffith and Sawyer (2010) elaborated more on how tacit knowledge is frequently learned by experience and how difficult it is to make tacit knowledge explicit. Because tacit knowledge is hard to codify and therefore difficult to share, tacit knowledge distinguishes organizations from one another (Griffith & Sawyer, 2010). Tacit knowledge can thus provide organizations with a competitive advantage which cannot be easily imitated by rivals (Hu & Randel, 2014). Explicit knowledge is defined as "knowledge codified and transferable in formal systematic methods, such as computer programs, codified work procedures, customer databases, and company rules and policies" (Hu & Randel, 2014, p.224). According to Griffith and Sawyer (2010) explicit knowledge can be transmitted, for example, via face-to-face training, informal meetings, email, and/or custom designed technology management systems. Hu and Randel (2014) mentioned that while it seems easier to transfer explicit knowledge there are still barriers involved in sharing explicit knowledge, such as when patents protect knowledge and guard against imitation or when employees are dealing with confidential information. Because tacit and explicit knowledge sharing differ in their characteristics and the way they might be influenced, in this research both dimensions of knowledge sharing will be included. Below it is elaborately discussed in which way the dependent variables influence tacit and explicit knowledge and how these influences differ from one another.

According to the knowledge-based view of the firm, knowledge is the foundation of a firm's competitive advantage and, ultimately, the primary driver of a firm's value (Bock, Zmud, Kim & Lee, 2005). In a competitive and dynamic economy, such as the Dutch Health care industry, knowledge is a critical organizational resource that provides a sustainable competitive advantage (Wang & Noe, 2010). Organizations can no longer only rely on their primary operations but need to more effectively exploit knowledge-based resources that already exist within the organization. Because, knowledge sharing is the fundamental means through which employees can contribute to knowledge application, innovation, and ultimately the competitive advantage of the organization (Wang & Noe, 2010).

More often organizations invest considerable time and money in state-of-the-art technology to facilitate knowledge sharing. An example of such an investment, which can be seen in the healthcare sector, is the growing number of hospitals implementing an EHR (Van Dorresteijn, 2014, April 10). However, often organizations fail to share knowledge despite these investments. According to Wang and Noe (2010) an important reason for this failure to share knowledge is the

lack of consideration of how the organizational and interpersonal context as well as individual characteristics, influence knowledge sharing. Tacit knowledge resides within individuals, and, as mentioned before, there are still barriers involved in the sharing of explicit knowledge, these phenomena should be considered when looking at the sharing of knowledge within an organization. The way in which organizations can benefit from the knowledge based-resources that already exist in the organization, depends on the knowledge sharing behavior of the employee (Bock, Zmud, Kim & Lee, 2005).

2.2 Knowledge sharing antecedents

Because knowledge sharing occurs not only at the individual level, but at the organizational level as well, there are several things an organization can do in order to aim to increase the knowledge sharing among its employees (Eid & Nuhu, 2011). As mentioned above, one solution is the introduction of state-of-the-art technologies that may empower the employee by providing the tools to support and boost his or her knowledge-sharing skills (Hendriks, 1999), but also by changing employee attitudes and behaviors an organization can promote willingness and consistent knowledge sharing (Eid & Nuhu, 2011). There are several antecedents, organizational and otherwise, to knowledge sharing. Some examples are:

- Organizational structure, organizational climate, leadership and intensity of relationships (Van den Hooff & Huysman, 2009; Radaelli, Mura, Spiller & Lettieri, 2011; Yu, Hao, Dong & Khalifa, 2013; Hu & Randel, 2014; Chang, Huang, Chiang, Hsu & Chang, 2012; Srivastava, Bartol, & Locke, 2006);
- Obligation and identification (Rosendaal, 2009; Yu, Hao, Dong & Khalifa, 2013; Hu & Randel, 2014; Van den Hooff & Huysman, 2009);
- Willingness to share knowledge (Van Den Hooff, Schouten & Simonovski, 2012; King & Marks (2008);
- Trust (Renzl, 2008; Lee, Gillespie, Mann & Wearing, 2010; Chang, Huang, Chiang, Hsu & Chang, 2012; Panahi, Watson & Partridge, 2013; Li, Poppo & Zhou, 2010).

Many papers combine several of these above mentioned antecedents into three categories of social capital. Namely, structural, relational and cognitive social capital (Van den Hooff & Huysman, 2009; Radaelli, Mura, Spiller & Lettieri, 2011; Hu & Randel, 2014; Yu, Hao, Dong & Khalifa, 2013). Structural social capital entails all factors concerning the connections between actors. Thus, who and how can they be reached; Relational social capital entails all assets created and leveraged through relationships. Thus, trust, norms and sanctions, obligations and expectations, identity and identification; Cognitive social capital entails all resources providing shared representations, interpretations, and systems of meaning among parties thus, shared language, codes and narratives.

Van den Hooff and Huysman (2009) in their research used all three categories of social capital and next to that added organizational culture, organizational structure and the ICT-infrastructure of an organization, to their model. This thesis is loosely based on the model of Van den Hooff and Huysman (2009). However, in order to decrease the risk of issues in parameter estimation and therefore increase the chance of statistical significance of individual predictors, the choice was

made not to include as much antecedents of knowledge sharing. To ensure that this research covers all angles on knowledge sharing, from each of the three categories of social capital a variable was included in this model. Next to that, a dependent variable which covers the information technology angle of knowledge sharing is included. A small literature study was executed to map the variables from each angle, which are most often mentioned to influence knowledge sharing. The results are shown in appendix 2.

The level of frequency of communication amongst colleagues is included in this research from the angle of structural social capital; this angle looks at the intensity of a relationship. The level of trust amongst colleagues is included to cover the relational angle of knowledge sharing. The variable, level of shared values amongst colleagues is included to cover the angle of cognitive social capital and thus the method of communication. Next to that, also a variable concerning the ICT-infrastructure, namely 'use of IT-tools' was included in order to cover the more technical side of knowledge sharing. The following part of this thesis gives a further elaboration on these variables.

2.2.1 Frequency of communication between colleagues

The frequency of communication between colleagues is often mentioned as a factor with a large impact on the sharing of knowledge (Van den Hooff & Huysman, 2009; Radaelli, Mura, Spiller & Lettieri, 2011; Yu, Hao, Dong & Khalifa, 2013; Chang, Huang, Chiang, Hsu & Chang, 2012; Hu & Randel, 2014). When one searches the meaning of the word 'communication' the Oxford Dictionary (http://www.oxforddictionaries.com) presents the following; *'the imparting or exchanging of information by speaking, writing, or using some other medium'.* Based on this definition the frequency of communication between colleagues in this thesis is defined as the amount of times colleagues engage in an act of imparting or exchanging of information by speaking, writing, or using some other medium. In some papers this focus on characteristics of connections among members is referred to as structural social capital. Van den Hooff and Huysman (2009) explain how structural social capital is about the connections between actors – who and how can they be reached. Two competing mechanisms that operate between the level of frequency of communication and the level of knowledge sharing between colleagues have been suggested in the literature. On the one hand, papers mention that in order to be able to share knowledge and learn from one another as colleagues, employees must be closely connected and interact as frequently as possible (Chang, Huang, Chiang, Hsu & Chang, 2012). However, knowledge sharing is more than just communicating with one another. Knowledge is created when there is an interaction between individuals' beliefs and commitments and these messages (Ipe, 2003). Trough frequent interactions employees might be able to acquire tacit knowledge by observing, imitating and interacting with other employees (Chang, Huang, Chiang, Hsu & Chang, 2012). Next to this frequent interaction increases the likelihood of interaction between individuals' beliefs and commitments and the shared information, thus increasing the likelihood of creating and sharing knowledge. In addition, the frequent interactions between employees provide time and opportunities for exchanging explicit knowledge (Hu & Randel, 2014). Thus, the higher the frequency of communication amongst colleagues the higher the chance either tacit or explicit knowledge is shared. On the other hand, a high frequency of interaction might have

negative consequences for both tacit and explicit knowledge sharing. Because, maintaining and developing knowledge sharing relationships with many different colleagues might expose the employees to conflicting preferences and allegiances resulting in these employees showing less intention to share knowledge (Yu, Hao, Dong & Khalifa, 2013). This thesis combines both perspectives, stating that frequent interaction stimulates both tacit and explicit knowledge sharing to the point that employees are unable to maintain and develop their knowledge sharing relations with colleagues.

Hypothesis 1a: The relationship between the frequency of communication between colleagues and the level of tacit knowledge sharing is an inverted U-shape.

Hypothesis 1b: The relationship between the frequency of communication between colleagues and the level of explicit knowledge sharing is an inverted U-shape.

2.2.2 Trust amongst colleagues

Several authors stress that next to the frequency of interaction, relationships build on trust increase the willingness to provide useful knowledge (Chang, Huang, Chiang, Hsu & Chang, 2012; Lee, Gillespie, Mann & Wearing, 2010; Renzl, 2008). Mayer, Davis and Schoorman (1995) defined trust as 'the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party' (Mayer, Davis & Schoorman, 1995, P.712). If an employee trusts his or her colleagues, the colleague's approachability increases which is likely to increase the level of knowledge sharing amongst the employees (Chang, Huang, Chiang, Hsu & Chang, 2012). In line with this statement Hu and Randel (2014) mention that trust in coworkers and organizational commitment relates positively to tacit knowledge sharing. They describe how a high level of trust in colleagues and management might reduce perceived uncertainty, facilitate risk-taking behavior and foster a constructive orientation. As a result employees become confident in their individual value which makes them feel like they have something to contribute, subsequently enhancing the employees' willingness to share tacit knowledge with coworkers (Chang, Huang, Chiang, Hsu & Chang, 2012). Panahi, Watson and Partridge (2013) even go as far as stating that trust is one of the essential factors for knowledge sharing. This might not be the case for explicit knowledge sharing. Li, Poppo and Zhou (2010) in their paper discus how explicit knowledge is easily transferable if direct contact exist between colleagues, implying that trust is not particularly necessary. They do however recognize that a trusting relationship between colleagues is helpful no matter what type of knowledge is being shared. Thus, trust does facilitate knowledge sharing. However, trust has a stronger effect on tacit knowledge sharing than on explicit knowledge sharing. These statements lead to the following hypothesis which will be tested in this thesis:

Hypothesis 2a: Trust is positively related with the quantity of tacit knowledge sharing.

Hypothesis 2b: Trust is positively related with the quantity of explicit knowledge sharing.

Hypothesis 2c: Trust is stronger positively related with the quantity of tacit knowledge sharing than the quantity of explicit knowledge sharing.

2.2.3 Shared values amongst colleagues

Van den Hooff and Huysman (2009) found that next to trust between colleagues, shared values positively influences the level of knowledge sharing. According to Lowry, Roberts and Romano (2013) shared values can be defined as 'the artifacts, memories and activities of colleagues that are held in common'. Hu and Randal (2014) investigated the same relationship whilst making a distinction between tacit and explicit knowledge. They found support that shared values do relate to tacit knowledge sharing and do not relate to explicit knowledge sharing that much. According to Hu and Randel (2014) these findings stress the importance of shared values in order to increase tacit knowledge sharing. In line with these findings Chang, Huang, Chiang, Hsu and Chang (2012) found that employees with similar mental models about their work are more likely to share information on regular basis than are employees with different mental models and Tsai and Ghoshal (1998) found that possible miscommunications might be avoided when employees have similar perceptions about how to interact with one another resulting in more opportunities to exchange their ideas freely. Concluding the above mentioned, the following hypotheses are tested in this thesis. The footnote is made that the level of influences of shared values will be larger for tacit knowledge than for explicit knowledge:

Hypothesis 3a: Shared values are positively related with the quantity of tacit knowledge sharing.

Hypothesis 3b: Shared values are positively related with the quantity of explicit knowledge sharing.

Hypothesis 3c: Shared values are stronger positively related with the quantity of tacit knowledge sharing than the quantity of explicit knowledge sharing.

2.2.4 Information Technology tools

Davenport and Short (1990) define information technology tools as 'the capabilities offered by computers, software applications, and telecommunications'. Intranet is an example of one of the most prominent information technology tools to facilitate the sharing of knowledge (Hendriks, 1999). The use of such tools by hospitals in order to share knowledge has received little attention from researchers (Ali, Whiddett, Tretiakov &

Hunter, 2012). However, Van den Hooff and Huysman (2009) in their research found that the use of information technology tools enables knowledge sharing. Renzl (2008) similarly found that the documentation of knowledge is found to positively influence knowledge sharing. Thus indicating that organizations with an information technology context, facilitating documentation and transfer of knowledge, have employees working in an environment in which processes of knowledge sharing are stimulated (Van den Hooff & Huysman, 2009).

Ali, Whiddett, Tretiakov and Hunter (2012) mention that there are two dimensions by which an information technology context supports knowledge sharing namely, by using tools that facilitate the sharing of documented knowledge and by using tools which support discussions in order to transfer knowledge. As mentioned above explicit knowledge can be codified and captured in documentation, thus tools which facilitate the sharing of documentation likely increases the actual sharing of explicit knowledge. Similarly, information technologies which support discussions might be used to share explicit knowledge. While tacit knowledge is hard to codify, formal and a type of knowledge which can only be transmitted in direct interaction, one might expect that information technology tools which facilitate the sharing of documentation have no influence on the level of tacit knowledge sharing amongst employees. Next to this, while tacit knowledge can only be transmitted in direct interaction, one might expect that information technology tools which support discussions have a positive influence on the level of tacit knowledge sharing amongst employees. However, Griffith and Sawyer (2010) found that due to the need for socialization and direct interaction, which is harder to find through information technology tools, a positive influence of discussion facilitating tools on the level of tacit knowledge sharing is not likely. In line with the above mentioned findings, this thesis expects both information technology tools to positively influence the quantity of explicit knowledge sharing. However, it is expected that no increase in tacit knowledge sharing will be found for both information technology tools. Therefore, no hypotheses concerning these relationships are included. These statements lead to the following hypotheses:

Hypothesis 4a: Use of sharing documentation tools is positively related to the quantity of explicit knowledge sharing.

Hypothesis 4b: Use of discussion facilitation tools is positively related to the quantity of explicit knowledge sharing.

3. Methodological framework

3.1. Empirical setting and Research strategy

This research is a single case survey with additional interviews, which took place in a medium sized Dutch hospital, in this section referred to as the organization. The unit of analysis of this research is the employee. The organization entails roughly 3000 employees. The individual will be unit of observation within this research.

To answer the research question, data about knowledge sharing within the organization was gathered. The sample frame consists of all employees within the departments present on the organizational chart of the organization, which can be found in appendix 4. Looking at the organizational chart we can see that sectors which are present in the organization can be divided into 7 categories, namely:

1. Medical;
2. Medical support;
3. Medical and information technology;
4. Personnel and organization;
5. Purchasing department;
6. Finance;
7. Facility management.

Because the aim is to provide a sample of the target population in which all departments are represented, the goal was to include employees from all categories in this research. Therefore, stratified sampling was used. The overall population was divided in 7 subpopulations, strata. Each of these subpopulations represented one of the categories mentioned above. Within these strata convenience sampling was used. Employees of the organization were known to be not very willing to respond to electronic questionnaires. Based this previous experience with electronic questionnaires, the choice was made to distribute paper-based questionnaires in order to increase the response rate.

In addition to the questionnaires, four semi-structured interviews took place. These interviews were held to gain an in-depth understanding of results found after analyzing the questionnaires and to gain further insights on knowledge sharing within the organization. The respondents for the interviews were also chosen by stratified sampling. Since three control variables namely, age, years of employment and managerial position, seemed to have a significant influence on the level of knowledge sharing, these criteria were used to determine the respondents for the interviews. Thus, respondents with and without a managerial position; relatively young and somewhat older employees; employees which were working in the hospital shortly and employees working in the hospital for a longer period of time were included. Table 1 gives an overview of the respondents which participated in the interview phase. Since the questionnaires were answered anonymously it was not possible to use them in order to select respondents. Therefore, the researchers' contacts within the hospital and their networks were used. However, all respondents selected for an interview had previously filled in the questionnaire.

Table 1
Overview respondents for the interviews.

Respondent #	Managerial position	Age	Years of employment
Respondent 1	Yes	50-60	0-5
Respondent 2	No	40-50	15-20
Respondent 3	Yes	40-50	10-15
Respondent 4	Yes	20-30	0-5

3.2. Measures and validation

In order to ensure the applicability and understandability of the questionnaire two steps were taken. Firstly, several existing scales and items were altered in order to make them more applicable for this research. All alterations for each individual scale are discussed below in section 3.2. Second, all items were translated into Dutch. This was done to maximize the understandability of the items and ultimately the validity of data. The questionnaire, shown in appendix 3, enclosed seven general questions which were used as control variables. Next to this 34 questions were included to measure the dependent and independent variables.

- 4 questions to measure the level of tacit knowledge sharing amongst colleagues
- 4 questions to measure the level of explicit knowledge sharing amongst colleagues
- 4 questions to measure the level of frequency of communication amongst colleagues
- 6 questions to measure the level of trust amongst colleagues
- 6 questions to measure the level of shared vision amongst colleagues
- 3 questions to measure the use of sharing documentations tools
- 6 questions to measure the use of discussion facilitating tools.

Following the descriptions, the respondent was asked to score all of these questions on a 5-point Likert scale. Since not all line managers were eager on distributing the questionnaires on their departments themselves, the researcher walked around the entire hospital several times a week in order to distribute questionnaires. Unfortunately, the researcher was not able to find respondents in the purchasing department. Next to that, since all care units were included in the sample of a different research, which was also ongoing at the time and the board of the organization did not want to put too much pressure on its employees, the questionnaires could not be distributed in the care units. Leaving all outpatient clinics and non-medical units and excluding all ward nurses. Next to the exclusion of ward nurses almost no specialists were willing or able to take the time to fill in a questionnaire. As a result no perfectly representative sample of the population was included in this research. Gathering data from non-medical units did not seem to be a problem. However, gathering data from outpatient clinics was. The organization has decreased the amount of employees a little while ago. Therefore there are a limited number of employees working on the outpatient clinics and sometimes they even work for several specialisms. This reduction in staff combined with a high level of sick leave, and absent employees due to summer holidays, resulted into not enough employees and too much work. When visiting the outpatient clinics to distribute the questionnaires, often only two or three clinic assistants were present and they were very busy. In those situations five to ten questionnaires, depending on the size of the department, were left behind and appointments were made to pick them up a week later. Usually a week later no questionnaires were filled in due to the busy schedules. In the end the response rate increased by visiting the same outpatient clinics several times and by making clear arrangements with specific employees. However, still the amount of respondents was relatively low, when looking at the total number of employees present within the organization. The more respondents included in the research, the higher the statistical power during the analyses. Thus, the beforehand exclusion of a specific group of employees and some troubles during the data gathering might have influenced the results of this research.

The respondents had a maximum of 3 weeks to fill in the questionnaire. In order to increase the response rate two measures were taken. First, appointments were made concerning the hand in date of the questionnaire, resulting in a clear deadline, decreasing the chance of respondents forgetting the questionnaire. Second, departments at which questionnaires were distributed received an occasional reminder through phone or by a visit of the researcher.

215 of the total 3000 potential employees were approached to fill in the questionnaire. 126 questionnaires were completed and returned to the researcher. This means a response rate of 58,6% of all approached employees. Questionnaires were included in the data analysis if at least three items from each scale were answered. As a result all 126 questionnaires were included in the data analyses. However, four respondents did not complete the questions concerning the control variables these questionnaires were excluded from the regression analysis, leaving 122 questionnaires which could be included in the data analysis. From those 122 questionnaires, all questionnaires with scales for which at least 3 items were answered were included in the regression analysis.

Next, in order to ensure a reliable and valid measurement instrument was used, two tests were conducted. First, a confirmatory factor analysis was performed for each scale. A confirmatory factor analysis was chosen because only validated scales were used for this research and by doing so the researcher was able to test whether measures of a concept are consistent with its understanding of the nature of that concept. In appendix 6 the output of the factor analyses is presented. In section 3.2., the values found during the factor analyses for each individual concept is discussed.

After executing the factor analyses, the reliability of the scales was checked by the calculation of Cronbach's alpha. Cronbach's alpha should be equal to or above .7 in order to present an acceptably reliable scale (Pallant, 2010). Table 1 shows the results of the reliability analysis. As can be seen scores for all scales have a Cronbach's Alpha>0,7, except for the scale which measures discussion supporting tools. However, the Cronbach's Alpha for the scale which measures discussion supporting tools has a score near the 0,7. Therefore, all scales are seen as reliable. However, this lower reliability has to be taken into account when interpreting results. The output of the reliability tests is also presented in appendix 6.

Table 2
Results of the reliability analyses.

	Cronbach's Alpha	N of items
Tacit knowledge sharing	,806	4
Explicit knowledge sharing	,714	4
Frequency of communication	,718	4
Trust	,815	6
Shared vision	,789	6
Sharing documentation tools	,754	3
Discussion supporting tools	,661	6

3.2.1 The level of knowledge sharing

A variety of empirical indicators of knowledge sharing exists in the literature, ranging from a direct assessment of knowledge sharing (Al-Alawi, Al-Marzooqi & Mohammed, 2007) and knowledge sharing techniques (Davenport & Prusak, 1998) to willingness to share knowledge freely (Davenport & Prusak, 1998). The choice for the specific indicator used to

measure the level of knowledge sharing depends on the goals and context of the research in question. In the current study, I focused on how two different types of knowledge sharing, tacit and explicit, are influenced by antecedents of knowledge sharing from different perspectives. Thus, indicators related to tacit and explicit knowledge sharing were necessary to capture the level of knowledge sharing amongst colleagues in this study. The perception of the respondent on its own knowledge sharing behavior was a more adequate measure for the level of tacit knowledge sharing amongst employees. To validate this measure, I used Lin (2007) four-item tacit knowledge sharing scale, which he based on two other sources Bock and Kim (2002) and Daft (2001). To measure explicit knowledge sharing a scale developed by Lee (2001) was used. The scale consists of four questions which directly deal with the actual sharing of documented knowledge in forms which might be found in organizations (business proposals, reports, manuals and models).

In order to ensure the validity of the scale developed by Lee (2001) a confirmatory factor analysis was done. The 8 items used for the Knowledge Sharing Scale were subjected to a Principal Axis Factoring analysis (PAF). After the correlation matrix was inspected the researcher found that most coefficients were above .3. The Kaiser-Meyer-Oklin (Kaiser, 1970) value exceeded the recommended value of .6 with a found value of .822. Next to that, the Bartlett's Test of Sphericity (Bartlett, 1954) showed to be statistical significance, supporting the factorability of the correlation matrix. The PAF revealed two Eigenvalues exceeding 1, explaining 60,19% of the variance. An inspection of the screeplot revealed a clear break after the first factor and a small break after the second factor, inspection of the factor matrix showed all items loading quite strongly (above .4) on the first factor. Thus, the analyses showed that both one and two factors were plausible for this concept. Looking at the items in combination with the clear distinction which is made in the literature for tacit and explicit knowledge the researcher decided, a two-factor solution was maintained for this scale.

3.2.2 Frequency of communication amongst colleagues

As discussed above, the frequency of communication amongst colleagues represents the structural dimension of social capital. This dimension focuses on characteristics of the configuration of connections among members within a network. In order to measure the frequency of communication amongst colleagues a validated scale from Hu and Randel (2014) was used. The scale consisted of four items. A five-point Likert scale was employed ranging from 1, less than once a week or not at all; 2, once or twice; 3, three or four times; 4, five to six times and 5, six times or more. Since this scale was used to measure frequency of communication amongst team members instead of colleagues in general, the scale was slightly altered in the following ways to create a more adequate measure:

- First, in the items Hu and Randel (2014) refer to team meetings. In the used questionnaires team is altered to the somewhat broader concept 'colleagues'
- Second, the answer categories have been altered in order to decrease the influence of relativity. Therefore, quantitative answer categories were introduced.

- Third, in each statement the 'a week' is added in order to make the statement more clear and concrete.

After these alterations were made to the scale a confirmatory factor analysis was done. The 4 items used for the Frequency of communication Scale were subjected to a Principal Axis Factoring analysis (PAF). After the correlation matrix was inspected the researcher found that almost all coefficients were above .3. The Kaiser-Meyer-Oklin (Kaiser, 1970) value exceeded the recommended value of .6 with a found value of .670. Next to that, the Bartlett's Test of Sphericity (Bartlett, 1954) showed to be statistical significance, supporting the factorability of the correlation matrix. The PAF revealed one Eigenvalue exceeding 1, explaining 54,43% of the variance. An inspection of the screeplot revealed a clear break after the first factor, inspection of the factor matrix also showed all items loading on one factor. Therefore, a one-factor solution was maintained for this scale.

3.2.3 The level of trust amongst colleagues

Given my interest in the knowledge sharing implications of the relational point of view, respondents were asked to indicate the extent to which they trusted their colleagues. A five-point Likert scale was used with individually labeled answer categories ranging from "Strongly disagree" to "Strongly agree". In all cases, "Strongly agree" was coded as 5 while "Strongly disagree" was coded as 1. The scale consisted of six items and was used in previous research by Simons and Peterson (2000).

In order to ensure the validity of the scale developed by Simons and Peterson (2000) a confirmatory factor analysis was done. The 6 items used for the Trust Scale were subjected to a Principal Axis Factoring analysis (PAF). After the correlation matrix was inspected the researcher found that most coefficients were above .3 or close to .3. The Kaiser-Meyer-Oklin (Kaiser, 1970) value exceeded the recommended value of .6 with a found value of .791. Next to that, the Bartlett's Test of Sphericity (Bartlett, 1954) showed to be statistical significance, supporting the factorability of the correlation matrix. The PAF revealed one Eigenvalue exceeding 1, explaining 52,75% of the variance. An inspection of the screeplot revealed a clear break after the first factor, inspection of the factor matrix also showed all items loading on one factor. Therefore and because the researcher already expected to measure one factor a one-factor solution was maintained for this scale.

3.2.4 The level of shared values amongst colleagues

To capture the level of shared values among colleagues a validated scale from Chiu, Hsu and Wang (2006) was used. The scale consists of six items which can be scored on a five-point Likert scale ranging from 1 (not at all) to 5 (very much).

In order to ensure the validity of the scale developed by Chiu, Hsu and Wang (2006) confirmatory factor analysis was done. The 6 items used for the Shared Values Scale were subjected to a Principal Axis Factoring analysis (PAF). After the correlation matrix was inspected the researcher found that most coefficients were above .3 or pretty close to .3. The Kaiser-Meyer-Oklin (Kaiser, 1970) value exceeded the recommended value of .6 with a found value of .770. Also, the Bartlett's Test of Sphericity (Bartlett, 1954) showed to be

statistical significance, supporting the factorability of the correlation matrix. The PAF revealed two Eigenvalues exceeding 1, explaining 68,05% of the variance. An inspection of the screeplot revealed a clear break after the first factor and after the second factor, indicating one component. Next to that, the inspection of the factor matrix showed that all items loaded on one factor. Even though two eigenvalues exceeding 1 were found, since the screeplot and the factor matrix indicate one component, the researcher chose to maintain a one-factor solution for this scale.

3.2.5 The use of information technology tools

Ali, Whiddett, Tretiakov and Hunter (2012) in their paper discuss how the most commonly used knowledge sharing activities were associated with sharing documents electronically and electronic discussion facilitating tools. Therefore, in this research respondents were asked to rate the extent to which they use sharing documentation tools or discussion facilitating tools. A five-point Likert scale was used for both dimensions with individually labeled answer categories ranging from “not at all” to “very much”. In all cases, “very much” was coded as 5 while “not at all” was coded as 1. The scale for the use of sharing documentation tools consisted of three items. The scale for the use of discussion facilitating consisted of six items. Both scales were previously used by Ali, Whiddett, Tretiakov and Hunter (2012).

In order to ensure the validity of both scales developed by Ali, Whiddett, Tretiakov and Hunter (2012) a confirmatory factor analysis was done. The 9 items used for the use of information technology tools Scale were subjected to a Principal Axis Factoring analysis (PAF). The Kaiser-Meyer-Oklin (Kaiser, 1970) value exceeded the recommended value of .6 with a found value of .625. Next to that, the Bartlett’s Test of Sphericity (Bartlett, 1954) showed to be statistical significance, supporting the factorability of the correlation matrix. The PAF revealed three Eigenvalues exceeding 1, explaining 65,46% of the variance. An inspection of the screeplot revealed that is was difficult to find a clear break, a small break could be found after factor one and factor four. Looking at the content of the questions and the absence of clear breaks in the screeplot, the researcher decided to maintain a two-factor solution for this scale.

3.2.6 Control variables

Previous research on knowledge sharing has shown that there are several variables which influence knowledge sharing. In order to prevent from giving a distorted image of the influence of the independent variables used in this research on the level of knowledge sharing, these variables will be controlled for. First, research by Radaelli, Mura, Spiller and Lettieri (2011) has shown that age and experience have a positive influence on the level of knowledge sharing of an employee (Radaelli, Mura, Spiller & Lettieri, 2011). I therefore controlled for both age and experience by directly asking the respondents for their age and the years they are employed within the organization. Second, Srivastava, Bartol and Locke (2006) found that the educational background of employees has a positive impact on the level of knowledge sharing, meaning that more highly educated employees are more likely to share knowledge. Therefore this research also controlled for the educational

background of employees. In the questionnaire 7 answer categories were included to indicate the level of education of a respondent. However, after analyzing the questionnaires it became clear that some categories were chosen by only 1 or 2 respondents. As a result, in order to increase the power of the analyzed models the choice was made to compute the four 'lowest' answer categories and the option 'other…' into one, leaving 3 answer categories, namely, 1) Vocational education, 2) Polytechnic education and 3) University education. Third, women tend to be more likely to trust colleagues (Feingold, 1994). Whilst in this research trust is included as an antecedent of knowledge sharing, this research also controlled for gender. Fourth, this research controlled for the type of job an employee has. A distinction is made between jobs in which contact with patients is a part of the daily proceedings and jobs where contact with patients is not a part of the daily proceedings. Question five in the questionnaire simply asked respondents whether they deal with patients on a daily basis or not. Last, this research controls for the position of an employee. Meaning, does an employee have a managerial position or not. Employees in a managerial position are the link between layers and often the channel through which knowledge from the top of the organization is passed to the bottom of the organization and the other way around. It is assumed that as a result employees in a managerial position are more likely to have a higher level of knowledge sharing than employees that do not have a managerial position. Therefore, the researcher chose to control for the position of the respondent.

3.3. Analytical approach

The following section describes how the gathered data was analyzed.

3.3.1 Questionnaires

Spss22 was used to do a statistical analysis of the questionnaires. Before a regression analyses was executed, several steps were undertaken. First, the descriptive of the sample were analyzed, in order to determine whether action needed to be undertaken concerning any errors, missing values and outliers. No action needed to be undertaken. Also no, reversed items were included in the questionnaire. Thus, no items needed to be reverse recoded.

Second, since more than one independent variable was included in this research, a multiple regression analysis was necessary. For a multiple regression analyses several presuppositions apply (De Vocht, 2011). In order to execute the multiple regression analyses the researcher tested whether the data meets these presuppositions. The first presupposition states that all variables should have a ratio-scale, this is the case. The second presupposition states that multicollinearity should not be present. If multicollinearity is present two or more independent variables in the regression model strongly correlate. As a result the calculation of coefficients might be influenced since variables partially overlap, resulting in a decreased reliability. It was aimed to decrease possible multicollinearity concerns by measuring the bivariate correlation coefficients for each independent interval or ratio variable. However, no severe signs of multicollinearity were found (largest correlation = 0,626). The third presupposition states that al individual

relationships between the independent and dependent variables are normal distributed. If no normal distribution can be found there might be a strong deviation of the observed frequencies and the theoretically expected distribution, meaning that the distribution of the population might be leaning towards a maximum or minimum value. As can be seen in figure 2, a normal distribution can be found for both dimensions of knowledge sharing.

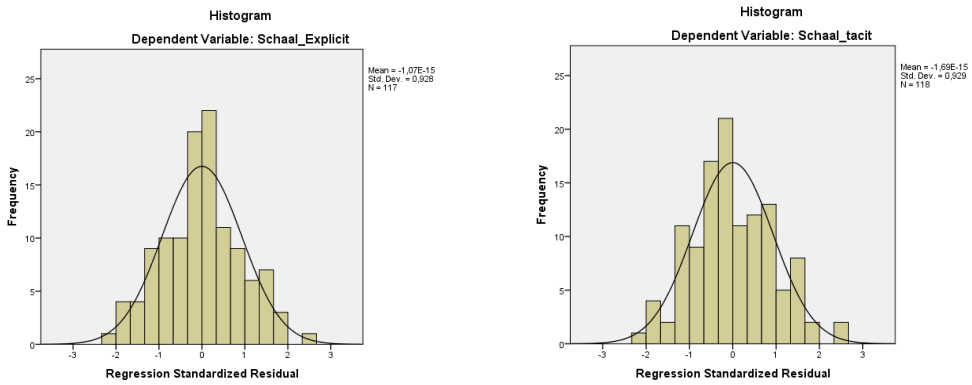

Figure 2 Histogram Tacit and Explicit knowledge sharing

Also, as discussed by Pallant (2010) a check for violation of the assumption of homoscedasticity should be done. In order to speak of homoscedasticity the variance of the residuals about predicted dependent variable scores should be the same for all predicted scores. A P-P plot was made for both tacit and explicit knowledge sharing in order to test for homoscedasticity. If a violation is found for the assumption of homoscedasticity, the standard error might not be accurate and therefore also tests for significance and reliability would not be accurate. However, as can be seen in figure 3, since all values within the P-P plot almost completely fit the line, no violation of the assumption of homoscedasticity is present.

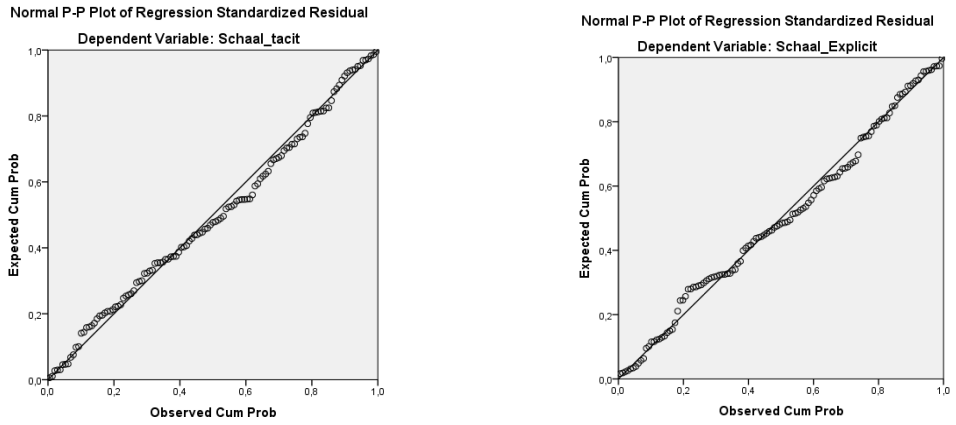

Figure 3 P-P plot test homoscedasticity

Concluding, the model meets all presuppositions. Therefore, an ordinary least squares regression analyses is suitable for this model. A squared value for the frequency of communication was included in the regression analyses, since an inverted U-shaped relationship was hypothesized for the relationship between the frequency of

communication and the level of both tacit and explicit knowledge sharing. The SPSS syntax which includes the steps taken during the analysis can be found in appendix 10.

Also, in this research two hypotheses were included which stipulate a relative rank order for predicted effects in term of their expected magnitude. Namely, hypothesis 2C which states that trust is stronger positively related with the quantity of tacit knowledge sharing than the quantity of explicit knowledge sharing, and hypothesis 3c which states that Shared values are stronger positively related with the quantity of tacit knowledge sharing than the quantity of explicit knowledge sharing. By comparing the regression coefficients for both concepts of knowledge sharing and the measured antecedent, this thesis aimed to make statements about both hypotheses.

3.3.2 Interviews

After analyzing the results of the questionnaire the choice was made to interview several respondent in order to gain an in-depth understanding of the found results and to gain further insights on knowledge sharing within the organization. Multiple steps have been taken to assure the quality of the analyses of the interviews. First, respondents gave their permission to record the interview, which made it possible to transcribe them afterwards. The transcription method chosen for this research is the Verbatim method, which means a word-for-word reproduction of verbal data, where the written words are an exact replication of the audio recorded words (Halcomb & Davidson, 2006). By recording and transcribing the interview the possibility of the researcher missing information during the interview, is reduced.

The coding analysis technique of Strauss and Corbin (1998, in Boeije, 2005) was used to analyze the data. First, open coding was used in order to analyze the different factors that influence the level of knowledge sharing. At this stage there was not yet a selection in terms of relevance. The texts were split into fragments, grouped and labeled. Second, in order to make the connections between categories, axial coding was used. Next to that, at this stage the labels were given a value in terms of relevance. The value was appointed to the labels by re-reading the transcripts and re-evaluating the already stated codes from the ‘open coding’ phase. Finally, selective coding based on the topic list was done. This leads to coding tables with labels concerning the variables used in this thesis. The outcomes of the coding processes are presented in the result section of the thesis. An overview of these labels and quotes from the interviews were used in order to help answer the research question. A code tree can be found in appendix 8 and several coding tables can be found in appendix 9.

4. Results

4.1 Results of the questionnaires

4.1.1 Sample characteristics

Table 3 presents some descriptive statistics of the respondents. There was a huge variety in respondents looking at their age and years of employment in the organization. Most respondents were female, 99 females against 23 male (4 unknown). Concerning the type of job, the data shows that most respondents did not have a managerial position.

Table 3

Descriptive statistics of sample firm.

	Mean	S.D.	Min.	Max.	n
Level of tacit knowledge sharing	4,03	,48	3	5	126
Level of explicit knowledge sharing	3,30	,73	1,75	5	125
Frequency of communication amongst colleagues	2,57	1,08	1	5	126
Level of trust amongst colleagues	3,79	,52	2,5	5	126
Level of shared vision amongst colleagues	3,78	,44	2,50	4,83	126
Use of sharing documentation tools	3,26	,82	1	5	125
Use of discussion supporting tools	1,37	,44	1	2,83	126
Gender[1]	,81	,39	0	1	122
Age	41,79	11,11	17	62	119
Education - Polytechnic education[2]	,29	,50	0	1	126
Education - University education[2]	,10	,31	0	1	126
Years of employment	12,5	10,54	1	37	121
Managerial position[3]	,16	,37	0	1	122
Contact with patients[4]	,56	,50	0	1	122

[1] male is the reference category,
[2] Vocational education is the reference category,
[3] A non-managerial position is the reference category,
[4] No contact with patients on a daily basis is the reference category.

Table 4 presents the correlations among the variables included in the statistical analysis. The correlation matrix shows that the strongest positive correlation can be found between the variables shared vision and trust ($r = 63$, $n = 126$, $p < 0,05$). So, high levels of a shared vision are associated with high levels of trust amongst colleagues. Furthermore, there was an almost as strong positive correlation between the variables years of employment and age ($r = .62$, $n = 126$, $p < 0,05$). Meaning, high level of years of employment is associated with a high level of age.

Moreover, the correlation matrix shows that the strongest negative correlation appears to be between the variables sharing documentation tools and discussion facilitating tools ($r = -.36$, $n = 126$, $p < 0,05$). So, high levels of sharing documentation tools are associated with low levels of sharing documentation tools. The second strongest negative correlation can be found between the control variable contact with patients and the dependent variable explicit knowledge sharing ($r=-.32$, $n=126$, $p<0,05$). Thus, contact with patients is associated with a low level of explicit knowledge sharing.

Table 4
Correlations[a].

	1	2	3	4	5	6	7	8	9	10	11	12
1. Tacit knowledge sharing												
2. Explicit knowledge sharing	,57*											
3. Frequency of communication	,09	,34*										
4. Trust	,32*	,19*	,09									
5. Shared vision	,30*	,29*	,05	,63*								
6. Sharing documentation tools	,09	,39*	,55*	,18*	,29*							
7. Discussion supporting tools	,04	,16†	,24*	,05	,02	-,36*						
8. Gender	,05	-,11	-,23*	-,11	,01	-,26*	-23*					
9. Age	,18†	,17†	-,01	-,05	,19*	,06	-,22*	-,12				
10. Education	-,03	,18*	,37*	,05	-,03	,28*	,09	-,10	-,05			
11. Years of employment	-,00	,06	,03	-,03	,06	,20*	-,05	-,05	,62*	-,14		
12. Managerial position	,13	,18*	,41*	,01	-,01	,34*	-,03	-,29*	,18*	,17†	,06	
13. Contact with patients	-,08	-,32*	-,22*	-,02	-,04	-,17†	,05†	,13	-,17†	-,24*	,03	-,19*

[a] N = 126,
† p < .10,
** p< .05.*

4.1.2 Hypothesis testing

The hypotheses were tested using an ordinary least squares regression analysis. Separate models were estimated for tacit and explicit knowledge. In table 5, I report the results of the multiple linear regression analyses predicting the level of tacit knowledge sharing as well as the level of explicit knowledge sharing. Model 1 and 4 constitute the baseline models with only the control variables. Next, model 2 adds the main effects of tacit knowledge sharing by including the independent variables to test the hypotheses. Model 3 also adds to the main effects of tacit knowledge sharing by including the independent variables to test the hypotheses. However, in this model a squared measure for frequency of communication is included as well, to enable testing for an inverted U-shaped relationship. Next, model 5 adds the main effects of explicit knowledge sharing by including the independent variables to test the hypotheses. Finally, model 6 also adds to the main effects of explicit knowledge sharing by including the independent variables to test the hypotheses. However, in this model, similar to model 3, a squared measure for frequency of communication is included to enable testing for an inverted U-shaped relationship. The hypothesis testing is based on model 3 and model 6 because these models are most complete and in line with the hypothesis.

Hypotheses 1a and 1b postulate an inverted U-shaped relationship between the frequency of communication amongst colleagues and the level of both tacit and explicit knowledge sharing. Both, model 3 and model 6 of table 5 show that no significant inverted U-shape relationship is to be found ($b_{\text{frequency squared tacit}}$=,049, p>0,1; $b_{\text{frequency squared explicit}}$=-,066, p>0,1). Therefore, no support

was found for both hypotheses 1a and 1b. Adding to this, the linear variable of the frequency of communication was also included in the regression analyses. Model 2 and model 5 of table 5 show that also when hypothesizing a linear relation, no significant influence of the frequency of communication on the level of either tacit or explicit knowledge sharing can be found ($b_{frequency\ tacit}$=,067, p>0,1; $b_{frequency\ explicit}$=,116, p>0,1).

Table 5
Results of regression predicting both tacit and explicit knowledge.

Variables	Tacit knowledge sharing			Explicit knowledge sharing		
Step 1: Controls	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	3,697*** (,231)	1,854*** (,474)	1,487* (,566)	3,033** (,342)	,516* (,704)	0,029 (,835)
Gender[1]	,130 (,119)	,240* (,119)	,268* (,121)	-,056 (,176)	,101 (,175)	,138 (,178)
Age	,012* (,005)	,016** (,006)	,016** (,006)	,007 (,008)	,013 (,008)	,013 (,008)
Polytechnic education[2]	-,091 (,102)	-,101 (,098)	-,086 (,099)	-,082 (,151)	-,142 (,144)	-,122 (,145)
University education[2]	-,252 (,160)	-,286† (0,155)	-,287† (,154)	,270 (,236)	,113 (,227)	,111 (,227)
Years of employment	-,009 (,006)	-,012* (,006)	-,012* (,006)	,003 (,008)	-,004 (,008)	-,005 (,008)
Managerial position[3]	,065 (,127)	,023 (,122)	,012 (,122)	,492* (,188)	,409* (,179)	,394* (,179)
Contact with patients[4]	-,176† (,096)	-,154 (,098)	-,169† (,099)	-,115 (,143)	,004 (,148)	-,014 (,149)
Step 2: Main effects						
Frequency of communication		,067 (,050)	,336 (,233)		,116 (,073)	,478 (,343)
Trust		,245* (,110)	,236† (,110)		,056 (,164)	,043 (,164)
Shared Values		,096 (,136)	,130 (,139)		,237 (,201)	,282 (,205)
Sharing documentation tools		-,006 (,073)	-,025 (,074)		,168 (,108)	,144 (,111)
Discussion facilitating tools		,117 (,108)	,118 (,108)		,176 (,158)	,176 (,158)
Frequency of communication squared		/	,049 (,042)		/	-,066 (,061)
R^2	,101	,249	,259	,140	,291	,299
Adj. R^2	,044	,163	,166	,085	,209	,210
F	1,772	2,900**	2,795**	2,551†	3,555***	3,377***
N[5]	119	118	118	118	117	117

[1] male is the reference category,
[2] another type of education is the reference category,
[3] A non-managerial position is the reference category,
[4] No contact with patients on a daily basis is the reference category,
[5] As a result of missing values several values for N are found. As much questionnaires as possible for each model were included to maximize the statistical power. All questionnaires with scales for which at least 3 items were answered were included in the research. A conservative regression analysis (n=116) is done as well in order to test for significant changes in the results of the regression, no significant changes in results were found,
† p < .10,
** p < .05,*
*** p < .01,*
**** p < .001.*

Next, hypothesis 2a and 2b propose that trust is positively related with the quantity of tacit as well as explicit knowledge sharing. Consistent with hypothesis 2a, model 2 of table 5 shows that the linear by linear interaction between the level of trust amongst colleagues and the level of tacit knowledge sharing, is positive and significant (b_{trust}=,245, p>0,05). Based on model 3 a similar relationship was found only this effect is weakly significant (b_{trust}=,236, p>0,10). Thus support was found for hypothesis 2a. Dissimilar results were found for hypothesis 2b. Model 5 of table 5 shows that the linear by linear interaction between the level of trust amongst employees and the level of explicit knowledge sharing is positive and not significant (b_{trust}=,056, p>0,1). Looking at model 6 again a positive but non-significant effect is found (b_{trust}=,043, p>0,1). Thus, hypotheses 2b found no support. For this antecedent of knowledge sharing another hypothesis was created, hypothesis 2c, which stated that trust is stronger positively related with the quantity of tacit knowledge sharing than the quantity of explicit knowledge sharing. A significant result was found for the influence of trust amongst colleagues on tacit knowledge sharing (b_{trust}=,245, p>0,05) but no significant support has been found for the influence of trust amongst colleagues on explicit knowledge sharing (b_{trust}=,056, p>0,1), indicating that there might not be a relationship between trust and explicit knowledge sharing. Therefore, the conclusion is made that indeed trust is stronger positively related with the quantity of tacit knowledge sharing than the quantity of explicit knowledge sharing, since no effect has been found between trust and explicit knowledge sharing, thus supporting hypothesis 2c.

Next, hypothesis 3a and 3b propose that shared values are positively related with the quantity of tacit as well as explicit knowledge sharing. As can be seen in model 2 of table 5, inconsistent with hypothesis 3a, the linear by linear interaction between the level of shared values amongst colleagues and the level of tacit knowledge sharing is positive but not significant ($b_{Shared\ values}$=,096, p>0,1). Similar results were found when looking at model 3 of table 5 ($b_{Shared\ values}$=,130, p>0,1). Also for hypothesis 3b similar result were found when looking at both model 5 and model 6 of table 5 ($b_{Shared\ values}$=,237, p>0,1 and $b_{Shared\ values}$=,282, p>0,1). Thus hypotheses 3a and 3b were not supported. Again, for this antecedent of knowledge sharing another hypothesis was created, hypothesis 3c, which stated that shared values are stronger positively related with the quantity of tacit knowledge sharing than the quantity of explicit knowledge sharing. Since no significant support has been found for the influence of shared values amongst colleagues on either tacit or explicit knowledge sharing, no statements can be made about the relative strength of both relationships when comparing them. Therefore, in this thesis also no support has been found for hypothesis 3c.

Next, hypothesis 4a proposes that the use of sharing documentation tools is positively related with the quantity of explicit knowledge sharing. As shown in model 5 and model 6 of table 5, no support was found for this hypothesis ($b_{sharing\ documentation\ tools}$=,168, p>0,1 and $b_{sharing\ documentation\ tools}$=,144, p>0,1). Finally, model 5 and 6 in table 5 shows how no support is found for hypotheses 4b, which states that the use of discussion facilitation tools is positively related to the quantity of explicit knowledge sharing. The analysis shows that that the

Table 6 Summary results hypotheses

Hypotheses	Conclusion
Hypothesis 1a	Not supported
Hypothesis 1b	Not supported
Hypothesis 2a	Supported
Hypothesis 2b	Not supported
Hypothesis 2c	Supported
Hypothesis 3a	Not supported
Hypothesis 3b	Not supported
Hypothesis 3c	Not supported
Hypothesis 4a	Not supported
Hypothesis 4b	Not supported

use of discussion facilitating tools has no significant influence on the quantity of explicit knowledge sharing (in both models $b_{\text{discussion facilitating tools}}$=,176, p>0,1).

Concluding the above, table 6 gives an overview of the hypothesis and whether support has or has not been found.

4.1.3 Control variables

Next to the hypothesized relationships some control variables were included in this research. Some significant influences from these control variables on the level of tacit knowledge sharing has been found. First, gender and age were found to have a positive significant effect on tacit knowledge sharing. Indicating that female employees have a higher level of knowledge sharing and that older employees have a higher level of knowledge sharing. Second, an university education was found to have a negative but weakly significant effect on the level of tacit knowledge sharing, meaning that as compared to employees with another level of education, employees with a university education share less tacit knowledge. Third, a negatively significant influence from years of employment on tacit knowledge sharing has been found. Thus, the longer someone is employed within this organization, the less tacit knowledge will be shared by this person. Last, contact with patients is found to have a negative weakly significant effect on tacit knowledge sharing, indicating that employees that have contact with patients on a daily basis do share less tacit knowledge sharing as compared to their colleagues that have no contact with patients on a daily basis.

Also, a significant influence from one control variable on the level of explicit knowledge sharing has been found. The analysis of the data showed that a managerial position has a positive significant influence on the level of explicit knowledge sharing. Indicating that employees in a managerial position share more explicit knowledge as compared to employees without a managerial position.

4.2 Results of the interviews

Additional to questionnaires, interviews were held to gain an in-depth understanding of results found after analyzing the questionnaires and to gain further insights on knowledge sharing within the organization. During the interviews at first the respondents were asked for their opinion on knowledge sharing within the organization. Second, the hypothesized relationships were discussed. Third, the control variables, for which support was found, were discussed. And last, respondents were asked which other factors they feel influences the level of knowledge sharing. These steps will also be used to structure this particular section. Table 7 gives a brief overview of the results of the interviews.

As can be seen in the table, some topics were only discussed by one or two respondents. Even though similar topic lists were used for all interviews, respondents contributed a diversity of factors to the interviews. This might be explained by their background, position within the organization or amount of years they are employed within the organization.

Table 7
Brief overview results interviews

Variables	Subject	Findings	Resp.
Knowledge Sharing	Definition	Four different definitions, reciprocity the common nominator	1, 2, 3, 4
	Conscious use of knowledge	Operational vs. strategic knowledge	1, 3, 4
	Reciprocity	Concerning operations agreements are made to share knowledge	1, 2
	Attitude	Knowledge sharing depends on the attitude	2
	importance	If perceived important knowledge is shared	1, 2, 4
	Different ways	Formal vs. informal knowledge sharing	4
Frequency of communication	Goal of meeting	Sometimes meetings just because that's the way it goes, goal unclear	1
	Efficiency	Some meetings were arranged to often, even though there was nothing to share	1, 3
	Contact	Face-to-face vs. e-mail communication	2, 3
	Non-Spontaneous	Non-spontaneous communication which should be arranged might decrease knowledge sharing as compared to frequent, informal and spontaneous contact	4
	Inverted U-shaped	Sharing knowledge with two individuals is no problem. However when there are there will be a moment knowledge will not be shared with everyone anymore.	4
Trust amongst colleagues	Misuse	No trust in a colleague might make more careful. You might think twice before you share important information because you cannot be sure if it will be used against you.	4
	Positive	If you trust colleagues than you are more likely to share your knowledge.	2, 3, 4
	Content	A distinction has to be made in the content of the knowledge. Operational vs. political	1
	Reciprocity	Trust and the sharing of knowledge between colleagues goes both ways	1, 3
	Form of knowledge	Tacit and explicit knowledge sharing are perceived to be equally influenced by trust. However sharing documents is easier.	2
Shared values	Importance	If perceived that shared knowledge with colleagues with different values, will not be used it will not be shared.	2
	Conscious use of knowledge	If it is felt that it might benefits one's vision not to share knowledge then that knowledge won't be shared	1
	Similar levels	If you have the same vision than you are on a similar level and you want to reach the same goal which makes it easier to share knowledge.	2, 3, 4
Use of IT-tools	Actual use	The organization has several tools to share knowledge but many of them are not used	1, 2, 3, 4
	Tool not antecedent	It is perceived that these tools do not result in more knowledge sharing but are just used when to share knowledge. It is still just a mean like sending a letter.	4
	Source of reference	SharePoint is an easy tool to bundle information, than it can be found in one place.	1, 2, 3
Control variables	Age	Experience and motivation as a result of aging decreases the level of knowledge sharing. However, older people might own more knowledge to share and thus share more.	1, 2, 3, 4
	Years of employment	Routine's and experience within the organization might decrease the level of knowledge sharing	1, 2, 3, 4
	Managerial position	It depends on the type of manager whether knowledge is or is not shared. Some focus on the operations others on strategy and politics	1, 2, 3, 4
Other	Direct vs. indirect	Results should differ for direct and indirect colleagues. Indirect colleagues are more difficult to form an opinion about	1, 2, 3, 4
	Reorganization	Reorganizations bring insecurity's. In some cases as a result people share less and some cases more knowledge	1, 2, 3, 4
	Motivation	If someone is not motivated knowledge sharing might decrease.	2
	IQ	People with a lower education might be less aware on how to use knowledge to benefit from it.	4
	Character	The assumption is made by a respondent that personality might influence the level of knowledge that is shared	4

4.2.1 Knowledge sharing within the organization

During the interviews, respondents indicated that they felt that the level of knowledge sharing within the organization is good.

> *'..In general I think it is good. People should be open to share knowledge and I feel like they are..' (Respondent 2, October 13th)*

During the interviews all respondents were asked to give their definition of knowledge sharing. All respondents came with a different definition. Although the common nominator seemed to be reciprocity, knowledge sharing goes both ways. Respondent 1 mentioned the following.

> *'..If I miss certain information, employees within this hospital that have that knowledge should provide it to me. The other way around I do not feel that I have the right to keep knowledge concerning operations from my colleagues. So it has to be open and transparent from both sides...' (Respondent 1, October 9th)*

4.2.2 The hypothesized relationships

First, the frequency of communication amongst employees was included in this research as an antecedent. When asked about the frequency of communication possibly influencing the level of knowledge sharing, most respondents at first did feel like a high frequency only positively influences the level of knowledge sharing. However, after thinking about it for a while some respondents came with examples illustrating that too much communication could also decrease the level of knowledge sharing. Respondent 1 for example mentioned the following:

> *'..Initially I am inclined to say that I did not experience to much communication yet. However, when I think about it for a while, there are people which I sometimes see so often and for such a long period of time that it sometimes has a restrictive influence on the amount of knowledge we share..' (Respondent 1, October 9th)*

According to the respondents after a certain frequency of communication amongst colleagues, less knowledge is shared simply because there is no more knowledge left to share. Respondent 3 mentioned:

> *'…Within our team we used to have meetings once a week. After a while we decided to decrease the amount of meetings to once every two weeks because we should not have a meeting just for having a meeting. There should be enough information which can be discussed during these meetings…' (Respondent 3, October 13th)*

During the interviews it became clear that respondents felt like knowledge sharing benefits from a high frequency of communication. But in some cases employees do meet with each other that often that after a while there is nothing left to discuss.

Second, the effect of trust on the level of knowledge sharing was included in this research and discussed during the interviews. Respondents indicated that they felt like trust determines whether knowledge is or is not shared, even though some of them were a little hesitant concerning this topic.

> *'…On the hand I do think it helps if you trust each other…yeah I think it does. I also think you might receive more knowledge if the other person trusts you…… because you know what to expect from one another…' (Respondent 3, October 13th)*

Although according to the respondents a distinction in the type of knowledge sharing has to be made. Knowledge concerning operations generally is shared, even if no trusting relationship between colleagues is present, but for sharing knowledge concerning politics and strategy a trusting relationship is needed.

> *'…uhm, a distinction has to be made because if you do not trust somebody for me there is no reason to keep operational knowledge from them. However, the other type of knowledge especially the political and organizational knowledge, that's different. In that case I might become more reluctant to share knowledge...' (Respondent 1, October 9th)*

In general, the respondents did feel like the level of knowledge sharing does benefit from a high level of trust amongst colleagues, especially when this sharing of knowledge concerns the sharing of political and organizational knowledge.

The third antecedent included in this research is the shared vision amongst employees. Respondents mentioned how sharing a vision according to them makes it easier to share knowledge.

> *'…if you share a vision with a colleague, you are on a similar level concerning a topic and you want to achieve the same thing, which makes it easier to share knowledge…' (Respondent 2, October 13th)*

One of the respondents felt strongly about the influence of a shared vision on knowledge sharing, adding that the type of knowledge is very important. Even though the respondents did feel like a shared vision definitely helps with knowledge sharing, the side note was made that this is not the case for all types of knowledge. Respondent 1 mentioned that operational knowledge should be shared no matter what, just because that's agreed upon within the organization. However, in case of political and operational knowledge it seems to be a different story. Respondent 1 exemplified this, high lighting the fact that, when more in line with his or her own vision, in some cases knowledge is kept from others.

> *'…I completely agree with that statement. I do recognize this since I do not share the same vision with certain colleagues, which sometimes influences the amount of knowledge I share with these colleagues. If I feel that not sharing certain information is more in line with my vision, comparing with their vision, every once in a while chose not to share this knowledge and I will keep the facts to myself. However, this is the case for political and organizational knowledge rather than for operational knowledge…' (Respondent 1, October 9th)*

The fourth antecedent of knowledge sharing included in this research is the use of IT-tools. A distinction was made between discussion facilitating and sharing documentation tools. When asked, respondents mentioned that there are several tools which can be used for knowledge sharing. SharePoint was a tool which was mentioned most often. This is what respondent 2 said about using SharePoint:

> *'…It certainly has its advantages however I should use it more often …' (Respondent 2, October 13th)*

Respondents were not completely sure whether such tools in a way actually influenced knowledge sharing, since they do not actually use many of these tools. However they did expect the tools to beneficial for knowledge sharing.

> *'…SharePoint, Yes that does help, especially as a source for reference concerning projects. That way you can be certain that everybody is working with the same information…' (Respondent 1, October 9th)*

Adding to this, respondent 4 stated that information technology tools might not directly influence the amount of knowledge that is shared but are just which help when knowledge needs to be shared. However, in a way the respondent feels like in the end it thus might actually increase knowledge sharing just because it is now easier. The respondent exemplifies this by mentioning social media and the amount of knowledge which is shared trough that medium.

> *'…I do feel like these tools do not result in more knowledge sharing but are just used when to share knowledge. It is still just a mean like sending a letter. However a tool might in the end also increase the amount of knowledge that is shared just because it is easier….' (Respondent 4, October* 20th)

4.2.3 The control variables

During the analysis, the interpretation of the data concerning the control variables changed occasionally. Therefore, during the interviews respondents were confronted with two directions for the influence of the control variables on tacit and explicit knowledge sharing. The first control variable discussed in the interviews was age. When confronted with this variable and its influence on knowledge sharing respondent two stated;

> *'…I would say that the older one is the more knowledge he or she has to share. Looking at myself I cannot say that the amount of knowledge I share has increased by the years I have aged. I am still developing and gaining knowledge which in turn can be shared….' (Respondent 2, October 13th)*

Two respondents mentioned opposite results; indicating that they expected the experience or a decreased motivation from older employees to decrease the level of knowledge sharing.

'…I can imagine that older people share less knowledge because of their experiences with live. Younger people are less aware of that fact that knowledge can be used against but also for you. Older people are more aware of this and therefore might choose not to share certain knowledge…' (Respondent 1, October 9th)

~

'… Some older people just come and do their job. The older they are the less motivated to do something extra and share knowledge. It also matters whether you are in the primary process or in a different function in which after several years there might still be some challenges…' (Respondent 3, October 13th)

The second control variable the respondents were confronted with was the years of employment of the employee and its effect of knowledge sharing. One respondent mentioned that he has not been employed in the organization for that long and therefore does not feel like he can make statements concerning this topic. The second respondent felt like the longer someone is employed in one organization the more knowledge there is to share. Two respondents mentioned how they felt that the longer somebody is employed within the organization, the less knowledge is shared. They indicated that again experience and a decreased motivation might be the cause for the amount of knowledge sharing to decrease.

'…it has to do with knowing how to use knowledge. After a while you know what the intentions of your colleagues are. The older you are the more careful you become…' (Respondent 4, October 20th)

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'…I recognize this because at one point your job becomes a routine and you might not even be aware of the fact that you for example do not share that much knowledge anymore. …' (Respondent 3, October 13th)

The last control variable the respondents were confronted with was the position of the employee, managerial or not, and its effect on the level of knowledge sharing. Several reactions were given.

'…Some identify with operational employees and others are tactically focused. (Respondent 1, October 9th)

~

'…Maybe they have bits of knowledge and forget to share it…' (Respondent 2, October 13th)

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'…It is a manager's task to build a network. That is not always done by sharing knowledge….' (Respondent 3, October 13th)

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'…managers might have to keep information from others cause of their task…' (Respondent 2, October 13th)

4.2.4 Other possible antecedents of knowledge sharing

During the interviews respondents were also asked whether they felt like there are other factors, not included in this research, to influence the level of knowledge sharing. Four different factors were mentioned. First, all four respondents felt like both the previous reorganizations and insecure situation as a result of the purchase of a new IT-system, do influence the level if knowledge sharing. However, they do not feel like it influences their knowledge sharing behavior.

> *'…I am not really bothered by those situations but I do feel that colleagues in insecure situations become more restrained in what they do and do not share. They become shivery in their knowledge sharing to ensure their position…' (Respondent 1, October 9th)*
>
> ~
>
> *'…All changes bring new opportunities, however it can also cost somebody their job. When afraid to lose their job I can imagine that employees will stop sharing knowledge…' (Respondent 2, October 13th)*
>
> ~
>
> *'…As a result some people decrease the amount of knowledge they share. Others increase the amount of knowledge they share. It both happens….' (Respondent 3, October 13th)*
>
> ~
>
> *'…I do think the insecurity makes people that want to keep their position, share less knowledge …' (Respondent 2, October 13th)*

Second, respondent 4 mentioned that the level of intelligence of a person might influence the level of knowledge sharing of this person. The respondent expects that employees with a lower intelligence might not be as aware on how to use knowledge to benefit from it when compared to employees with a higher intelligence.

> *'…Maybe the intelligence also influences the knowledge sharing of a person. Maybe people with a lower education are less aware how to use knowledge to benefit from it …' (Respondent 4, October 20th)*

Third, respondent 4 also felt like the character of an employee might influence the level of knowledge they share. The respondent felt like some people are naturally more inclined to share knowledge than others.

> *'…And maybe personality influences whether one does or does not share knowledge. Extrovert people are probably more likely to share as compared to introvert people…' (Respondent 4, October 20th)*

Fourth and last, respondent 2 mentioned that the motivation of an employee might determine whether they do, or do not share knowledge. And this motivation goes together with how comfortable an employee feels within an organization and how satisfied one is with his or her job.

> *'…If you like your job you are likely to be very motivated to do your job and share knowledge. I can imagine that if someone is not motivated that knowledge sharing decreases. …' (Respondent 4, October 20th)*

4.3 Synthesis

Table 8 gives an overview of the results of both the questionnaire data and the interview data. As can be seen in the table in some cases no significant support was found during the analysis of the questionnaire data. However, during the interviews some respondents did feel like the hypothesized relationships were plausible. These results will be discussed in section 5.

Table 8
Synthesis of the questionnaire and interview data

Variables	Hypothesis	Findings interview	
Knowledge Sharing	None	Definition	Four different definitions, reciprocity the common nominator
		Conscious use	Operational vs. strategic and Formal vs. informal knowledge sharing
		Attitude	Knowledge sharing depends on the attitude
		importance	If perceived important knowledge is shared
Frequency of communication	H1a: Not supported H1b: Not Supported	Respondents mention that meetings are arranged without a clear goal. As a result in some cases there was nothing to discuss and no knowledge to share. Also it was mentioned that non-spontaneous communication, thus planned meetings might decrease the amount of knowledge which is shared when compared to frequent, informal and spontaneous contact.	
Trust	H2a: Supported H2b: Not supported H2c: Supported	Respondents indicate that a lack of trust in a colleague might make an employee more careful concerning the amount and type of knowledge which is shared. Because one might be afraid that this knowledge will be used against them. However, a distinction has to be made in the content of the knowledge, namely operational versus political knowledge.	
Shared values	H3a: Not Supported H3b: Not Supported H3c: Not Supported	Respondents mention that in some cases, if colleagues have a different vision, knowledge will not be shared because the employee feels like the knowledge will not be used anyway. Also, If it is felt by the employee that it might benefit one's vision not to share specific knowledge, it won't be shared. However, if colleagues do have the same vision, than they are on a similar page concerning some topics which makes it easier to share knowledge.	
Use of IT-tools	H4a: Not supported H4b: Not supported	Respondents mention that the organization has several tools to share knowledge but many of them are not used. It is perceived by one respondent that these tools do not result in more knowledge sharing but are just used when knowledge is shared. However, these tools, for example SharePoint, are perceived to be very useful for the bundling of information.	
Control variables	None	Age	Respondents mention that experience and motivation as a result of aging, decreases the level of knowledge sharing that is shared. However, older people might own more knowledge to share and thus share more.
		Years of employment	Respondents indicate that routine's and experience within the organization, as a result of a high amount of years of employment, might decrease the level of knowledge sharing
		Managerial position	Respondents indicate that the level of knowledge sharing by managers depends on the type of manager they are. Some managers focus on the operations others on strategy.
Other variables influencing knowledge sharing	None	Direct vs. indirect	Respondents indicate that the given answers in the questionnaires would differ for direct and indirect colleagues. Because Indirect colleagues are more difficult to form an opinion about.
		Reorganization	Respondents feel like reorganizations bring insecurity's. These insecurity's in some cases result in employees sharing less and in some cases sharing more knowledge.
		Motivation	Respondents feel that if someone is not motivated knowledge sharing might decrease.
		IQ	Respondents feel like people with a lower education might be less aware on how to use knowledge to benefit from it.
		Character	The assumption is made by a respondent that personality might influence the level of knowledge that is shared

5. Discussion

In light of the increasing demands for quality in the health care sector and an increased level of competition amongst hospitals, the need for efficient mechanisms within hospitals to maintain competence and competitive advantage increases. An increased level of knowledge sharing within an organization is indicated in the literature as a way to increase the competitive advantage. Although many antecedents of knowledge sharing are mentioned, few of them were tested in the health care sector. In short, the goal of this research was to study which antecedents influence knowledge sharing within a hospital, determining which 'buttons' organizations can push in order to possibly increase the level of knowledge sharing. Based on the analysis no antecedents included in this research except of trust, were found to have a significant effect on the level of tacit knowledge sharing. Also, no antecedents included in this research were found to have a significant effect on the level of explicit knowledge sharing. However, five control variables were found to have a strong significant effect on the level of knowledge sharing. The theoretical implications of these findings are discussed below, along with the limitations of the study and suggestions for future research.

5.1 Theoretical implications

5.1.1 Significant results

Trust is the only antecedents included in this research for which a significant effect was found. In line with findings of Hu and Randel (2014), results of this thesis showed that trust amongst colleagues relates positively to tacit knowledge sharing, indicating that a high level of trust means a high level of tacit knowledge sharing. Also during the interview respondents emphasized the importance of trust, as far as mentioning that a lack of trust amongst colleagues might make an employee think twice before sharing important information, because one cannot be sure whether this knowledge will be used against them. Respondents however indicated that this was not the case for all types of knowledge. In this research a distinction was made between two dimensions of knowledge, tacit and explicit. Be that as it may, during the interviews respondents emphasized that a distinction in content of knowledge should be made, instead of in the tangibility of knowledge. With content of knowledge they referred to knowledge which is either used for daily operations and knowledge which concerns politics and strategy. Knowledge concerning operations is mentioned to be shared regardless of the level of trust amongst employees, since everybody has its task to perform. However, comprehensible, they argued that trust plays an important role when sharing knowledge which has a political or strategic content, since in some cases, when this type of knowledge falls in the wrong hands, it might influence the position of the individual sharing knowledge. This finding contributes to the literature on knowledge sharing by emphasizing the importance of making a distinction in content of knowledge.

Besides, this research contributes to the literature on knowledge sharing by finding significant effects for age, the years of employment and gender on the level of knowledge sharing. The findings concerning age are in line with the findings of Radaelli, Mura, Spiller and Lettieri (2011). They also found that age has a positive influence on the level of

knowledge sharing of an employee. First, in this thesis, the age of an employee is found to positively influence the employees' level of tacit knowledge sharing. This implies that older employees do share more tacit knowledge when compared to younger employees. However, during the interviews respondents mentioned that opposite results might also be possible. They mentioned that older employees are more experienced and more aware of how knowledge might be used in their advantage and also in their disadvantage. As a result of this increased experience, employees might knowingly withhold knowledge from others. Again these responses might be linked to a distinction which should be made in the content of knowledge. Knowledge concerning operations might be shared regardless and the older the employee, the more knowledge there is to share. However, when sharing knowledge which has political or strategic content, older employees are more aware of, and experienced with possible results of sharing such knowledge and therefore might choose not to, decreasing the amount of knowledge that is shared. Thus, indicating that older employees might have a decreased level of knowledge sharing if it concerns political or strategic knowledge, when compared to their younger colleagues.

Next to this, the findings concerning years of employment are contradicting the findings of Radaelli, Mura, Spiller and Lettieri (2011). They found that years of employment has a positive influence on the level of knowledge sharing of an employee. Only this thesis found that the amount of years a respondent is employed within the organization is found to negatively influence the employees' level of tacit knowledge sharing, which implies that respondents which are employed in the organization for a while do share less tacit knowledge when compared to respondents which have not been employed in the organization for that long. Similar to what was mentioned for the variable age, people which are employed in the organization for a longer period of time might have more knowledge to share. As discussed in the results section, the respondents did give several examples why this might not be the case, one of them being an increased awareness of the organization and knowledge which can be used in one own advantage but also against them. These results might be explained by the ever changing environment of the organization and reorganizations which took place in the last few years, possibly resulting in employees feeling vulnerable in their position and therefore becoming more aware of the damage that knowledge in some cases can do. As a result they may have, or may have seen others, to withhold information if they felt it might benefit them. This situation might have caused the negative influence of years of employment on knowledge sharing. Thus again, the content of knowledge might play an important role in the causal mechanisms for years of employment.

Also, as mentioned in section 3.2.6 this thesis expected that the position of an employee, so does an employee have a managerial position or not, influences the amount of knowledge that is shared. This was expected because employees in a managerial position are the link between layers and often the channel through which knowledge from the top of the organization is passed to the bottom of the organization and the other way around. This expectation has been confirmed during the analysis of the gathered data. This finding contributes to the literature on knowledge sharing by emphasizing the importance of

controlling for the position of the employee, in order to prevent from giving a distorted image of the level of explicit knowledge sharing.

Last, in line with the findings of Feingold (1994) this thesis shows that women tend to be more likely to share tacit knowledge. However, worth mentioning is the fact that only 23 respondents were of the male gender and 99 were female. This disproportional distribution might have influenced the results that were found concerning the influence of gender on the level of tacit knowledge sharing. Whether this has to do with trust as proposed by Feingold (1994) is not sure.

5.1.2 Non-significant results

The analysis on the effect of all antecedents included in this research but trust, found no significant effects. First, no significant effect for the hypothesized inverted U-shaped relationship between frequency of communication and knowledge sharing was found. The combination of the scale of frequency of communication and the definition for colleagues used in this research might have influenced the significance of the results. The scale consisted of several questions asking to indicate how often one talks, calls or e-mails their colleagues and how often there are meetings with colleagues. The definition of colleagues, mentioned in the questionnaires, was all other colleagues within the organization. However, the organization might have been too large to use this definition of colleagues. The organization is rather large and complex, it entails over 3000 employees and over a hundred different departments. Some of these departments have the same core business, for example providing care to patients. But, for other departments the core business might be human resource management or information technology. Some people might even say that the organization can be seen as one large organization containing of several small organizations, all with their own culture and dynamics. Since the organization is this big and an island culture seems to be present, it might have been difficult for respondents to answer the questions concerning how often they talk, call or e-mail their colleagues and how often there are meetings with colleagues, with all other employees in mind. Possibly different results were to be found if the level of analysis was the department or maybe even the team and thus a different definition for colleagues was chosen. Recognition of the possible influence this diversity of departments and the existence of an island culture is important, because it underlines the complexity of the organization and highlights the difficulties that are associated with knowledge sharing across boundaries, therefore contributing to the existing literature in knowledge sharing in large and complex organizations.

Second, although it was expected no significant effect was found for the effect between trust and explicit knowledge sharing. This might be a result of the turbulent time the organization is going through. During the data collection of both the questionnaires and the interviews, it became clear that a lot is happening within the organization, reorganizations took place and some jobs were declared to be redundant. The organization over the years has been employing many locals and sometimes even complete families. The past reorganization was the first time in many years that these people felt vulnerable

in their positions and that working within this organization was not a matter of course anymore. Respondents indicated that in some situations they chose not to share explicit knowledge since mostly explicit knowledge means sharing knowledge in writing. In situations in which respondents feel vulnerable and knowledge might be held against them, they prefer not sharing any. This insecure situation, possibly resulting in a lack of explicit knowledge sharing, might be the cause that no significant effect was found. If barely any explicit information is shared it becomes rather difficult to determine which factors determine whether the knowledge is shared. This finding contributes to the literature on knowledge sharing by emphasizing the influence that the feelings of insecurity and vulnerability might have on the relationship between trust and explicit knowledge sharing.

Third, no significant effects were found for the hypothesized relationship between shared values and knowledge sharing. The sig. value found for the influence of shared values on explicit knowledge sharing was ,17. A higher power in the analysis of the data might have resulted in a significant result. Even though the response rate was pretty high, looking at the amount of variables included in this research it might not have been high enough. Gathering data from outpatient clinics was difficult as a result of many absent employees and the holiday season. Next to that, reorganizations and other insecurities paired with the purchase of a new IT-system might also have influenced the response rate. This combination of reticence and a somewhat decreased sample population might have resulted in a smaller response rate than possible at another moment in time. The response rate for the questionnaires determines the power of the statistical analysis. Based on the results of the questionnaires combined with the result of the interviews, a significant effect for the relationship between shared values and explicit knowledge sharing should not be ruled out yet. However, the sig. value found for the influence of shared values on tacit knowledge sharing was ,35. The fact that no significant results were found again might be a result of the used definition of colleagues in this research. The scale consists of questions asking to indicate on a scale from 1 to 5 to extend to which they agree with certain statement. For example ‘’my colleagues and I share the vision of helping others with solving their professional problems’’. The used definition of colleagues was too far-reaching. Conceivably, a respondent sharing a similar vision with all other employees within the organization is almost impossible. Possibly different results were to be found if the definition for colleagues was altered to ‘all colleagues from your departments’ or ‘all colleagues in your team.

Fourth, contrary to expected no significant results were found for the influence of information technology tools on the level of knowledge sharing. During the interviews respondents indicated that the organization owns several discussion facilitating- or sharing documentation tools but that most of them are barely used. This statement might explain the lack of significance concerning this hypothesized relationship. If none of these tools are used, since the use of these tools is no part of the daily routine of employees, no statements can be made on their influence on the knowledge sharing within the organization. Even though, the availability of these tools might make it easier to share knowledge.

Last, during the interviews it became clear that respondents perceive the level of knowledge sharing within the organization to be good. However, it appeared that all respondents had their own definition of knowledge sharing. The only common factor in almost all of their definitions was reciprocity, implying that knowledge sharing goes both ways. Therefore, the current study shows that knowledge sharing is an ambiguous and broad concept. Recognition of this ambiguity is important, because it underscores the complexity of measuring the level of knowledge sharing within an organization.

5.2 Limitations and future research

The contribution of this study must be viewed against some limitations. First, as discussed in section 5.1, the concept of knowledge sharing appeared to be very ambiguous and broad. Also, next to the distinction between tacit and explicit knowledge within this research a distinction in content of knowledge should be made since the content of knowledge was often mentioned to be the determining factor in knowledge sharing. Therefore, future research should reevaluate the used definition of knowledge sharing and include a distinction in content of knowledge, for example operational knowledge versus political knowledge. By doing so, a more in-depth understanding of the mechanisms of knowledge sharing might be obtained.

Second, in future research, not only the concept of knowledge sharing should be altered but also the concept of colleagues could use some alterations. The reliability of this thesis was aimed to be increased by using variables with clear definitions which are supported by theory. Consequently the chance of respondents having different conceptual views about the concepts within this thesis was decreased. However, there seemed to be some confusion concerning some questions in which the research referred to colleagues. Even though the questionnaires clearly stated that colleagues meant all other employees within the hospital. This definition of colleagues was chosen since the research's scope was the whole organization and not individual departments. After discussing this 'problem' during the interviews it became clear that since the organization is so big and an island culture seems to be present, respondents felt like they could not answer the questions with all other employees in mind. This was the case because there are so many employees and the respondents are not able to form an opinion about 'indirect' colleagues. Next to this, respondents indicated to trust there direct colleagues but distrust their indirect colleagues, which possibly resulted in fairly moderate answers, especially on the trust scale. Thus, this definition of colleagues might have influenced the result of this research. Therefore, future research should make a distinction between direct and indirect colleagues and possibly including both types of colleagues. By doing so the chance of confusion concerning this definition might be decreased. Next to that, a distinction in departments or teams allows the researcher to make comparisons between teams or departments which might create new insights.

Third, as mentioned in section 5.1, this research found no strong significant support for almost any of the hypothesized relationships and some of these results might be explained by a lack of power. Therefore, in order to rule out the possibility that no effects were found as a result of the power of the statistical analyses future research should aim to include more respondents in this research. Possibly, if this research is to be repeated, in advance a larger time frame can be reserved

for the data gathering and other measures to increase the response rate, for example rewards, can be included.

Last, since this is a single case survey the generalizability is relatively low due to the fact that this research took place within one organization. However, by describing the research in a structured way and by explaining the context of the research the generalizability is kept as high as possible. To make it possible to in the future generalize results of this research, a theoretical framework and reference list were made. Adding to this, every step of the research is described making it replicable and therefore increasing the reliability of this research. In order to make it possible to generalize the result of this research, the research should be executed in several organizations.

5.3 Managerial implications

A direct implication of this research is that trust amongst employees is beneficial for the level of knowledge sharing within this organization, implying that a higher level of trust amongst colleagues increases the level of knowledge which is shared within the organization. This research thus underlines the importance of trust amongst colleagues. However, as can be concluded from the findings of this research, this is specifically the case if it concerns knowledge about strategy and politics. As mentioned by the respondents, employees might keep certain information, especially concerning strategy and politics, in those situations in which they feel vulnerable. Previous reorganizations and insecurity's as a result of the upcoming implementation of an EHR are named as situations which provoke these feelings of vulnerability and therefore might indirectly decrease the amount of knowledge that is shared. Consequently, the findings of this research can be used as a way to gain insights in the dynamics behind knowledge sharing within this particular organization. According to Adkins, Werbel and Farh (2001) the employees perceptions of receiving sufficient and correct information might increase trust in the organization and decrease perceived vulnerability. Thus, for the organizations, when willing the increase the level of knowledge sharing, it might be useful to emphasize the importance of sharing sufficient and correct information, to line management. If managers are more open and do share more, employees are likely to as well share more knowledge. Especially communication concerning the implementation of the new EHR might be use full. Possibly a bulletin board in the staff restaurant or the hallway of the hospital, which specifically includes information concerning the implementation of the EHR might decrease the insecurity and lack of information, as a result decreasing the trust within the organization. However, the level of sufficient sharing might differ for departments. Thus, first management might strive to ascertain when sharing is perceived as too much and too little. Also, trust is build trough recognition in similarities which in most cases is only possible trough face-to-face contact (Gibson & Manuel, 2003). In this electronic age, the amount of face-to-face meetings decreases. Preferably the organization facilitates and encourages face-to-face meetings. This might be done through the organization of monthly drinks or other activities. Consequently, the level of trust amongst colleagues will increase and the amount of knowledge sharing as well. Concluding, in order to increase the level of trust within the organization management should consider decreasing insecurities by being more transparent and sharing more information and encourage their employees to do so as well. Next to that, management should consider encouraging face-to-face meetings and informal gatherings.

In addition, from personal experience with the researched organization, it became clear that this organization employs many locals which intend to work here for a long period of time, resulting in a relatively high average years of employment amongst employees. Findings of this research emphasized that employee's which are employed in this organization for a longer period of time, do tend to share less knowledge as compared with their colleagues which are relatively new. Respondents mentioned an increased experience and awareness concerning knowledge and how it can be used, and a decreased motivation as possible explanations for this result. Motivation is a topic which can be influenced by the organizations management, in order to avoid the level of knowledge sharing from decreasing. Line management should consider thinking about ways in which they can keep their employee's motivated. Employees changing jobs within the organization might be a possible solution. By doing so, the employee faces new challenges and can continue learning. However, this option might not be feasible for all employees since many specialized jobs can be found within this organization. However, goal setting might be a feasible solution worth considering. All intentionally motivated behavior is presumably goal oriented, whether goals are self-generated or assigned by others (Meyer, Becker & Vandenberghe, 2004). Line management could arrange evaluation meetings with their employees several times a year. During these meetings targets can be set, which will be evaluated during the next meeting. Rewards can be linked to reaching the set target. This might be a financial reward but it might also be another form of recognition, for example an election for employee of the month or a coupon for a restaurant.

6. Conclusion

Within this chapter, an answer to the following research question is given.

'To what extent do the frequency of communication amongst colleagues, the level of trust amongst colleagues, the level of shared vision amongst colleagues and the use of IT-tools influence the level of both tacit and explicit knowledge sharing amongst employees? '

Based on the results and discussion presented earlier in this thesis, some conclusions can be drawn. First, the regression results found no support for a significant effect from the frequency of communication, the level of shared vision and the use of IT-tools, on the level of knowledge sharing amongst employees. Second, the questionnaires did find support for the influence of the level of trust on tacit knowledge sharing and no support for the influence of trust on explicit knowledge sharing. So, based on the regression results one can state all antecedents used in this research but trust, do not influence the level of either tacit or explicit knowledge sharing amongst employees within this organization. However, additional to questionnaires, interviews were held to gain an in-depth understanding of results found after analyzing the questionnaires and to gain further insights on knowledge sharing within the organization

First, even though no significant support was found, respondents recognized that the frequency of communication positively influences the level of knowledge sharing. All respondents but one also mentioned that there is a certain level of communication amongst colleagues at which the sharing of knowledge decreases. These statements are in line with the hypothesized inverted U-shape relationship. Even though no support was found for the relationship between the frequency of communication amongst colleagues and the level of knowledge sharing amongst employees, the respondents feel like an inverted U-shaped relationship is plausible.

Second, respondents recognized that the level of shared values amongst colleagues does positively influence the level of knowledge sharing. They mentioned how shared values often mean that you are on the same page and want to reach the same goal. Because of that, it is worth to share your knowledge since it is used for a 'goal' you also support. Thus, although no significant results were found, the respondents do feel like the level of shared values amongst colleagues does positively influence the level of knowledge sharing amongst colleagues.

Last, also no support was found for the hypothesized influence of IT-tools on the level of knowledge sharing. Respondents mentioned they felt that knowledge sharing did benefit from these tools. However, they felt like they could not make supported statements concerning this relationship since they have the tools but all of them are barely used. Thus, respondents do feel there is a positive influence on the level of knowledge sharing but these are just expectations.

Thus, based on the results of the questionnaires combined with the result of the interviews, a significant effect for all antecedents included in this research should not be ruled out yet. The ambiguous concepts of knowledge sharing, a relatively low response rate and the complexity and magnitude of this organization might have influenced the results of this research. Therefore, in order to be able to make more founded statements, a similar research with a few alterations, should be performed once more.

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Appendix 1 Operationalization Table

Concept	Definition	Dimensions Subcategories/indicators	Measurement/ calculation of scores
The level of Knowledge Sharing (dependent variable)	Knowledge sharing in general 'the provision of task information and know-how to help others and to collaborate with others to solve problems, develop new ideas, or implement policies or procedures' Wang and Noe, 2010 Tacit knowledge 'knowledge which is very difficult to articulate, formalize and communicate, such as technical know-how, tactics for market promotion, managerial techniques, and the way people do things in the company (corporate culture)" Hu and Randel (2014) Explicit knowledge "knowledge codified and transferable in formal systematic methods, such as computer programs, codified work procedures, customer databases, and company rules and policies" Hu and Randel (2014)	1. Tacit knowledge 2. Explicit Knowledge	1. Tacit knowledge sharing (validated scale from Lin, 2007) - I share my job experience with my co-workers. - I share my expertise with my co-workers. - I share my ideas about jobs with my co-workers - I share my tips on jobs with my co-workers. 2. Explicit knowledge sharing (validated scale from Lee, 2001) - I share business reports with my colleagues. - I share business manuals, models and methodologies with my colleagues. - I share success and failure stories with my colleagues. - I share business knowledge obtained from newspapers, magazines, journals and television with my colleagues. Each item is scaled 1 (not at all) to 5 (very much).
Frequency of communication between colleagues	the amount of times colleagues engage in an act of imparting or exchanging of information by speaking, writing, or using some other medium. Based on the Oxford dictionary	/	The frequency of team member communication (validated scale from Hu & Randel, 2014) - Indicate how often a week meetings with colleagues take place. - Indicate how often a week you call or e-mail other colleagues. - Indicate how often a week you walk up to colleagues to give updates. - Indicate how often a week you write notes to update colleagues.

			Each item is scaled 1 (less than once a week or not at all), 2 (once or twice), 3 (three or four times), 4(five to six times) and 5 (six times or more). This scale has slightly been adjusted in several ways. - First, in these statements Hu and Randel (2014) refer to team meetings. In the used questionnaires team is altered to the somewhat broader concept 'colleagues' - Second, the scale to rate these statements is altered in order to decrease the influence of relativity on for example much gained from previous experiences. - Third, in each statement the 'a week' is added in order to make the statement more clear and concrete.
Trust	'the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party' Mayer, Davis and Schoorman (1995)	/	Trust (validated scale from Simons & Peterson, 2000) - Each one of my colleagues shows absolute integrity. - Amongst colleagues we expect the complete truth from each other. - I am certain that I can fully trust my colleagues. - I am not worried that my colleagues will take advantage of me. - I absolutely respect competences of my colleagues. - I can rely on my colleagues. Each item is scaled 1 (not at all) to 5 (very much). Several authors use dimensions for the concept of trust. These dimensions can for example be integrity, competence etc. However, in the contemporary literature dealing with knowledge sharing and trust amongst colleagues no questionnaires were found which used several dimensions.
Shared values	'the artifacts, memories and activities of colleagues that are held in common' Lowry, Roberts and Romano (2013)	/	Shared values (validated scale from Chiu, Hsu & Wang, 2006). - My colleagues and I share the vision of helping others with solving their professional problems. - My colleagues and I share the same goal of learning from each other. - My colleagues and I share the same value that helping others is pleasant. - My colleagues and I share the same ambitions and vision

			- My colleagues and I are enthusiastic about pursuing the collective goals and missions of the whole organization. - My colleagues and I pursue collective goals and missions. Each item is scaled 1 (not at all) to 5 (very much).
Information technology tools	'the capabilities offered by computers, software applications, and telecommunications'. Davenport and Short (1990)	1. Sharing documents tools 2. Supporting discussions	1.Sharing documents (validated scale from Ali, Whiddett, Tretiakov & Hunter, 2012) - While carrying out my job I access documents published by my colleagues on computer networks (via shared drives, web sites, groupware, social networking sites, etc.) - In order to carry out our jobs my colleagues and I exchange documents as email attachments. - In order to carry out our jobs my colleagues and I publish documents on computer networks (via shared drives, web sites, groupware, social networking sites, etc.) to share them with our colleagues 2.Supporting discussions (validated scale from Ali, Whiddett, Tretiakov & Hunter, 2012) - My colleagues and I use blogs to share opinions/information. - My colleagues and I discuss issues via chatrooms. - My colleagues and I discuss issues via email lists. - My colleagues and I discuss issues via electronic forums. - My colleagues and I use teleconferencing to discuss issues. - My colleagues and I use videoconferencing to discuss issues. Each item is scaled 1 (not at all) to 5 (very much).
Control variables	- Gender - Age - Education - Years of employment in this hospital - Position		

Appendix 2 Categorization contemporary literature

Y	+	-	No relation
Structural social capital =	**Structural social capital in general:** Van den Hooff & Huysman (2009) *The level of structural social capital positively influences knowledge sharing* Radaelli, Mura, Spiller & Lettieri (2011) *Practitioners' perception of the social capital of the organization positively affects their sharing of knowledge.* Yu, Hao, Dong & Khalifa (2013) *The relationship between an individual's structural capital in a team and his/her knowledge sharing in the team is in an inverted U-shape.*		Chang, Huang, Chiang, Hsu & Chang (2012) *Social interaction is positively related to knowledge sharing. → not significantly supported* Hu & Randel (2014) *Knowledge sharing mediates the relationship between structural social capital in teams and team innovation. → Not supported*
Relational social capital =	**Identification:** Rosendaal (2009) *The more that team members identify themselves with their team, the more they are inclined to share their knowledge with the other team members.* Yu, Hao, Dong & Khalifa (2013) *An individual's affective commitment to the belonging team will enhance his/her knowledge sharing in the team.*		
	Cooperative norms: Yu, Hao, Dong & Khalifa (2013) *The stronger cooperative norms within a team will increase the nested individuals' knowledge sharing in the team. → partially supported*		
	Relational social capital in general: Yu, Hao, Dong & Khalifa (2013) *An individual's perceived shared cognition with other members in a team will enhance his/her knowledge sharing in the team.* Hu & Randel (2014) *Knowledge sharing (tacit and explicit) mediates the relationship between relational social capital in teams and team innovation. → partially supported*		

	Van den Hooff & Huysman (2009) *The level of relational social capital positively influences knowledge sharing*		
	Willingness to share knowledge: Van Den Hooff, Schouten & Simonovski (2012) *Both eagerness and willingness to share knowledge will be higher in the high pride than the low pride condition.* ***&*** *Both eagerness and willingness to share knowledge will be higher in the high empathy than the low empathy condition.* King & Marks (2008) *The level of perceived organizational support is positively associated with the frequency knowledge sharing.*		
	Trust: Renzl (2008) *Trust in management reduces fear of losing one's unique which in turn has a positive impact on knowledge sharing.* *&* *The relationship between trust and knowledge sharing is mediated by knowledge documentation and fear of losing one's unique value.* Lee, Gillespie, Mann & Wearing (2010) *The impact of the leader's knowledge builder role on team knowledge sharing will be mediated by (1) reliance-based trust and (2) disclosure-based trust in the team.* Chang, Huang, Chiang, Hsu & Chang (2012) *Trust is positively related to knowledge sharing.* Panahi, Watson & Partridge (2013). *Trust positively influences tacit knowledge sharing* Li, Poppo & Zhou (2010). *Trust increases goodwill and therefore knowledge sharing for tacit as well as explicit knowledge.*		
Cognitive social capital =	**Cognitive social capital in general:** Van den Hooff & Huysman (2009) *The level of cognitive social capital positively influences knowledge sharing* Hu & Randel (2014) *Knowledge sharing (tacit and explicit) mediates the relationship between cognitive social capital in teams and team*		

	innovation. → partially supported		
	Shared vision Chang, Huang, Chiang, Hsu & Chang (2012) *Shared vision is positively related to knowledge sharing.* Yu, Hao, Dong & Khalifa (2013) *A higher level of cognition commonality within a team will increase the nested individuals' knowledge sharing in the team*		
	Knowledge sharing climate Radaelli, Mura, Spiller & Lettieri (2011) *Practitioners' perception of the organizational knowledge sharing climate positively affects their sharing of knowledge.*		
Other knowledge sharing facilitating tools	King & Marks (2008) *The level of supervisory control is positively associated with the frequency knowledge sharing.* Srivastava, Bartol, & Locke (2006) *We found empowering leadership in management teams to be positively related to knowledge sharing in teams.* Renzl (2008) *Documentation of knowledge has a positive impact on knowledge sharing.*		

Appendix 3 Questionnaire

Beste collega's,

Allereerst wil ik u bedanken dat u mee wilt doen aan dit onderzoek. Deze vragenlijst gaat over de factoren die bijdragen aan de kennisdeling binnen dit ziekenhuis. Graag wil ik u vragen alle antwoorden in te vullen, de door u verstrekte informatie zal strikt vertrouwelijk en anoniem behandeld worden en niet aan derden worden verstrekt.

Bij elke vraag dient één antwoord te worden gegeven. In deze vragenlijst zijn geen juist of onjuiste antwoorden mogelijk. Wanneer u het antwoord wilt wijzigen kunt u door het verkeerde antwoord een kruis zetten en vervolgens het juiste antwoord omcirkelen. Het invullen van de vragenlijst neemt ongeveer 10 minuten in beslag. Wanneer u nog vragen of opmerkingen heeft of u wilt op de hoogte blijven van de resultaten van het onderzoek, stuurt u een e-mail naar; a.lelkens@tilburguniversity.edu.

Bij voorbaat dank!

Met vriendelijke groet,

Anouk Lelkens
Student Organisatiewetenschappen

Onderdeel A

1. **Wat is uw geslacht?**

- ○ Man
- ○ Vrouw

2. **Wat is uw leeftijd?**

_____ Jaar

3. **Wat is de hoogste opleiding die u heeft afgerond?**

- ○ Lager beroepsonderwijs (bv. LBO, LEAO, LTS)
- ○ Voorbereidend middelbaar beroepsonderwijs (bv. MAVO, MULO, VMBO)
- ○ Voortgezet onderwijs (bv. HAVO, VWO)
- ○ Middelbaar beroepsonderwijs (bv. MBO, MEAO, MTS)
- ○ Hoger beroepsonderwijs (bv. HBO, HEAO, HTS)
- ○ Wetenschappelijk onderwijs (WO)
- ○ Anders, namelijk _____

4. **Hoeveel jaren bent u werkzaam bij het [redacted]?**

_____ Jaar

5. **Is contact met patiënten een onderdeel van uw dagelijkse werkzaamheden?**

- ○ Ja
- ○ Nee

6. **Wat is uw huidige functie?**

_____

7. **Op welke afdeling bent u op dit moment werkzaam?**

- ○ [redacted]
- ○ [redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- Anders, namelijk _____

Onderdeel B

Onderstaand vindt u stellingen waarmee u het eens of oneens kan zijn. Geef alstublieft aan in welke mate u het (on)eens bent met de stelling door een antwoord aan te kruisen dat het meest overeenkomt met uw mening ten opzichte van het standpunt. Wanneer binnen deze stelling wordt verwezen naar collega's worden hiermee alle medewerkers binnen het [redacted] bedoeld en niet alleen uw directe collega's.

Stelling	Nooit	Weinig	Soms	Vaak	Altijd
8. Ik deel mijn werkervaringen met mijn collega's	O	O	O	O	O
9. Ik deel mijn deskundigheid met mijn collega's	O	O	O	O	O
10. Ik deel werk gerelateerde ideeën met mijn collega's	O	O	O	O	O
11. Ik deel mijn tips over het uitvoeren van werk met mijn collega's	O	O	O	O	O
12. Ik deel bedrijfsplannen met mijn collega's	O	O	O	O	O
13. Ik deel handleidingen, werkprocessen en methodes van werken met mijn collega's	O	O	O	O	O
14. Ik deel werk gerelateerde verhalen over successen en mislukkingen met mijn collega's	O	O	O	O	O
15. Ik deel kennis opgedaan uit media (bv. vakbladen, kranten, tijdschriften, internet, televisie) met mijn collega's	O	O	O	O	O

1. **Kruis alstublieft aan hoe vaak per week een vergadering met collega's plaats vindt.**

- ○ Minder dan 1 keer per week of helemaal niet
- ○ 1 a 2 keer per week
- ○ 3 a 4 keer per week
- ○ 5 a 6 keer per week
- ○ Meer dan 6 keer per week

2. **Kunt u aangeven hoe vaak u per week collega's belt of e-mailt.**

- ○ Minder dan 1 keer per week of helemaal niet
- ○ 1 a 2 keer per week
- ○ 3 a 4 keer per week
- ○ 5 a 6 keer per week
- ○ Meer dan 6 keer per week

3. **Geef alstublieft aan hoe vaak u per week collega's opzoekt om werk gerelateerde updates te geven.**

- ○ Minder dan 1 keer per week of helemaal niet
- ○ 1 a 2 keer per week
- ○ 3 a 4 keer per week
- ○ 5 a 6 keer per week
- ○ Meer dan 6 keer per week

4. Geef alstublieft aan hoe vaak u per week een boodschap noteert voor een van uw collega's om een van uw collega's te updaten.

- Minder dan 1 keer per week of helemaal niet
- 1 a 2 keer per week
- 3 a 4 keer per week
- 5 a 6 keer per week
- Meer dan 6 keer per week

Stelling	Sterk oneens	Oneens	Niet eens en niet oneens	Eens	Sterk eens
20. Al mijn collega's zijn volkomen eerlijk en oprecht	O	O	O	O	O
21. Ik verwacht altijd de volledige waarheid van mijn collega's en mijn collega's verwachten dit ook van mij	O	O	O	O	O
22. Ik ben er zeker van dat ik mijn collega's volledig kan vertrouwen	O	O	O	O	O
23. Ik maak me geen zorgen dat mijn collega's misbruik van mij zullen maken	O	O	O	O	O
24. Ik respecteer de competenties en vaardigheden van mijn collega's volkomen	O	O	O	O	O
25. Op mijn collega's kan ik bouwen	O	O	O	O	O
26. Mijn collega's en ik delen de visie om andere collega's te helpen met het oplossen van werk-gerelateerde problemen	O	O	O	O	O
27. Mijn collega's en ik delen het doel om van elkaar te leren	O	O	O	O	O
28. Mijn collega's en ik delen dezelfde waarde dat het helpen van andere een voldaan gevoel geeft	O	O	O	O	O
29. Mijn collega's en ik delen de zelfde visie en ambities	O	O	O	O	O
30. Mijn collega's en ik zijn enthousiast over het nastreven van het doel en de missie van het [redacted]	O	O	O	O	O
31. Mijn collega's en ik streven dezelfde collectieve doelen en missies na	O	O	O	O	O

Stelling	Nooit	Weinig	Soms	Vaak	Altijd
32. Tijdens het uitvoeren van mijn werk kijk ik regelmatig in documenten die door collega's op de computer zijn gezet (Gedeelde schijven, internet pagina's, intranet)	O	O	O	O	O
33. Tijdens het uitvoeren van mijn werk wissel ik regelmatig e-mails met documenten als bijlage uit met mijn collega's	O	O	O	O	O

Stelling	Nooit	Weinig	Soms	Vaak	Altijd
34. Tijdens het uitvoeren van ons werk plaatsen mijn collega's en ik regelmatig documenten op de computer om te delen met andere collega's (Gedeelde schrijfen, internet pagina's, intranet)	O	O	O	O	O
35. Mijn collega's en ik gebruiken blogs om meningen en informatie te delen	O	O	O	O	O
36. Mijn collega's en ik voeren discussies via chatrooms	O	O	O	O	O
37. Mijn collega's en ik voeren discussies per e-mails	O	O	O	O	O
38. Mijn collega's en ik voeren discussies via elektronische fora	O	O	O	O	O
39. Mijn collega's en ik voeren teleconferenties om issues te bespreken	O	O	O	O	O
40. Mijn collega's en ik voeren videoconferenties om vraagstukken te bespreken	O	O	O	O	O

41. Heeft u nog opmerkingen of vragen over de vragenlijst of het onderzoek?

……

……

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……

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Bedankt voor uw medewerking!

Met vriendelijke groet,
Anouk Lelkens

Email: a.lelkens@tilburguniversity.edu
Telefoon: 5847

Appendix 5 Topic list

The goal of the interviews is to:

- Find out how knowledge sharing in the hospital is seen by the employees. How do they define it, do they see a difference in tacit and explicit knowledge sharing and do they see any other trigger for knowledge sharing than trust, frequency of communication, shared values and facilitating tools?

- Gain more insight in the factors influencing the level of tacit and explicit knowledge sharing in a hospital. For example, are there any feasible factors that explain a high level of knowledge sharing? And because most of the hypotheses are not accepted, can the employees name an explanation for this?

- The questionnaires often included the side note added by employees that it was hard to answer the questions because employees would give different answers to the questions when concerning their direct colleagues than when the questions concerned indirect colleagues. Find out how come they would answer these questions differently and what their answers would be. Do they feel like their knowledge sharing would differ between direct and indirect colleagues? And if so how come?

- During the analyses of the control variables it was found that age and years of employment have a negative influence on tacit knowledge sharing and that managerial position has a negative influence explicit knowledge sharing. Find out if employees agree with these findings and is so why?

Set-up of the interviews:

Introduction

- Introduction and role in the organization
- Introduction to the interview and mentioning it is anonymous.
- Results questionnaire.

Knowledge sharing

- How does the respondent perceive and define knowledge sharing
- Do they reckon there are two types of knowledge sharing (tacit and explicit) and do they feel there is a difference?
- What is the opinion of the employee on how knowledge is shared within the hospital?
- What makes that the employee doe share knowledge? Is this an rational decision?

Frequency of communication

- The literature states that the frequency of communication is an inverted u-shaped relationship. At first more contact means a more possible to share knowledge thus more sharing. However, more contact with lots of people means an overload which makes it hard to maintain knowledge sharing relations resulting in less knowledge sharing, how does the respondent view this relationship? What is his/her vision?
- Does the employee have the feeling that frequency of communication in colleagues does influence whether knowledge is shared?

Trust

- The literature states that trust positively influences knowledge sharing, how does the respondent view this relationship? What is his/her vision?
- Does the employee have the feeling that trust in colleagues does influence whether knowledge is shared?

Shared vision

- The literature states that a shared vision positively influences knowledge sharing, how does the respondent view this relationship? What is his/her vision?
- Does the employee have the feeling that a shared vision with colleagues does influence whether knowledge is shared?

Knowledge facilitating tools

- The literature states that discussion facilitating tools (fora, e-mail, chatrooms, etc) positively influences knowledge sharing, how does the respondent view this relationship? What is his/her vision?
- The literature states that sharing documentation tools (gedeelde schijven, intranet, Sharepoint, etc) positively influences knowledge sharing, how does the respondent view this relationship? What is his/her vision?
- Does the employee have the feeling that these facilitating tools actually do influence whether knowledge is shared?

Control variables

- During the analyses it was found that has a negative influence on tacit knowledge sharing (skills etc.). Thus meaning the older the employee the less they share, can you relate to this statement?
- During the analyses it was found that years of employment has a negative influence on tacit knowledge sharing (skills etc.). Thus meaning the longer one is employed in the hospital the less they share, can you relate to this statement?

- During the analyses it was found that managerial position has a negative influence on explicit knowledge sharing (tangible, documents, e-mails etc.). Thus employees in a managerial position share less knowledge, can you relate to this statement?

Direct vs. Indirect colleagues

- Often mentioned that the answer to the question depends on direct or indirect colleagues, does one relate to these side notes?
- If so, how come these questions would be answered differently?
- What would their answers be?
- Looking at the antecedents for knowledge sharing included in this thesis. How would these differ in influence on knowledge sharing with direct and indirect colleagues?

Closing

- Questions about the interview or research?
- Thank the interviewee for his or her time.

Appendix 6 Output factor analyses and reliability analysis

6.1 Knowledge sharing

6.1.1 Factor analyses knowledge sharing

Communalities

	Initial	Extraction
Tacit1	,338	,240
Tacit2	,412	,434
Tacit3	,623	,694
Tacit4	,603	,769
Explicit1	,369	,548
Explicit2	,381	,399
Explicit3	,354	,286
Explicit4	,346	,461

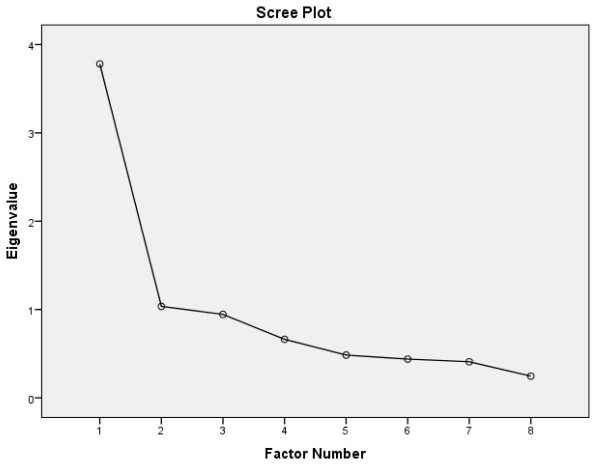
Extraction Method: Principal Axis Factoring. Total Variance Explained

Factor Matrix[a]

	Factor	
	1	2
Tacit1	,464	-,156
Tacit2	,649	-,111
Tacit3	,818	-,156
Tacit4	,804	-,349
Explicit1	,604	,428
Explicit2	,630	,038
Explicit3	,523	,109
Explicit4	,565	,376

Extraction Method: Principal Axis Factoring.

a. 2 factors extracted. 12



KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,822
Bartlett's Test of Sphericity	Approx. Chi-Square	335,017
	df	28
	Sig.	,000

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3,780	47,252	47,252	3,308	41,352	41,352	3,083
2	1,035	12,939	60,191	,521	6,518	47,870	2,430
3	,945	11,811	72,002				
4	,663	8,283	80,285				
5	,484	6,053	86,338				
6	,439	5,483	91,821				
7	,409	5,107	96,928				
8	,246	3,072	100,000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

6.1.2 Reliability analyses tacit knowledge sharing

Reliability Statistics

Cronbach's Alpha	N of Items
,806	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Tacit1	12,02	2,595	,437	,836
Tacit2	12,02	2,330	,618	,760
Tacit3	12,02	2,000	,708	,712
Tacit4	12,12	1,877	,744	,692

6.1.3 Reliability analyses explicit knowledge sharing

Reliability Statistics

Cronbach's Alpha	N of Items
,714	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Explicit1	10,46	4,267	,582	,601
Explicit2	9,49	5,685	,469	,670
Explicit3	9,58	6,096	,437	,689
Explicit4	10,12	4,870	,541	,626

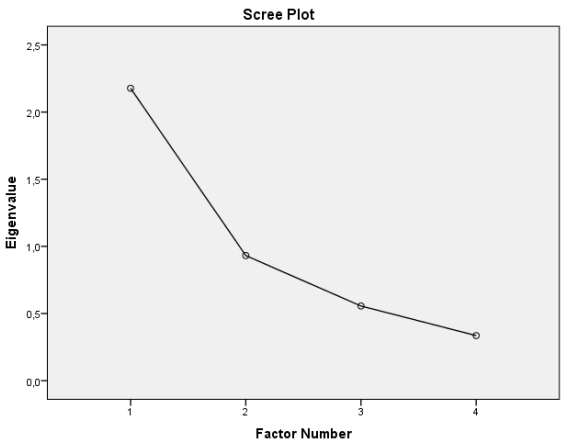
6.2 Frequency of communication

6.2.1 Factor analyses frequency of communication

Communalities

	Initial	Extraction
Frequency1	,169	,145
Frequency2	,432	,538
Frequency3	,510	,844
Frequency4	,236	,225

Extraction Method: Principal Axis Factoring.



KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,670
Bartlett's Test of Sphericity	Approx. Chi-Square	111,652
	Df	6
	Sig.	,000

Factor Matrix[a]

	Factor 1
Frequency3	,919
Frequency2	,734
Frequency4	,474
Frequency1	,381

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 19 iterations required.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sum		
	Total	% of Variance	Cumulative %	Total	% of	
1	2,177	54,427	54,427	1,752	43,797	43,797
2	,932	23,288	77,715			
3	,556	13,899	91,613			
4	,335	8,387	100,000			

Extraction Method: Principal Axis Factoring.

6.2.2 Reliability analyses frequency of communication

Reliability Statistics

Cronbach's Alpha	N of Items
,718	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Frequency1	8,80	15,172	,324	,746
Frequency2	7,08	9,097	,625	,579
Frequency3	7,64	9,257	,711	,514
Frequency4	7,81	12,859	,412	,709

6.3 Trust

6.3.1 Factor analyses trust

Communalities

	Initial	Extraction
Trust1	,570	,545
Trust2	,353	,354
Trust3	,607	,600
Trust4	,319	,336
Trust5	,229	,229
Trust6	,478	,579

Extraction Method: Principal Axis Factoring.

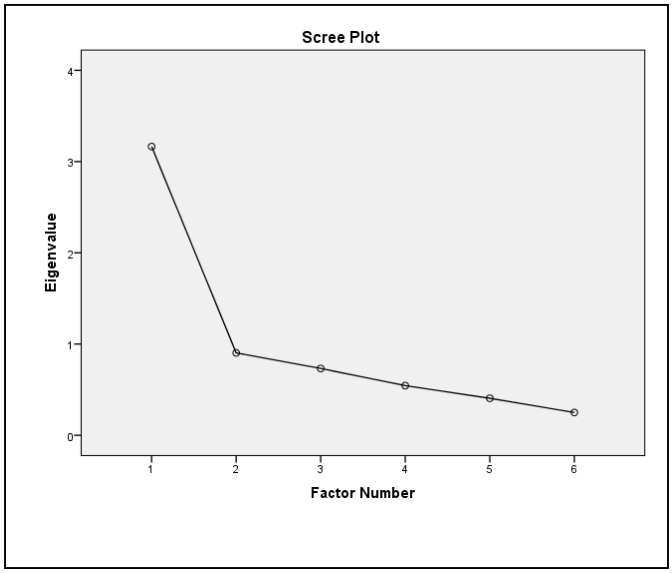
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,791
Bartlett's Test of Sphericity	Approx. Chi-Square	257,350
	Df	15
	Sig.	,000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,165	52,749	52,749	2,643	44,056	44,056
2	,903	15,051	67,799			
3	,733	12,209	80,009			
4	,544	9,071	89,080			
5	,406	6,759	95,839			
6	,250	4,161	100,000			

Extraction Method: Principal Axis Factoring.



Factor Matrix[a]

	Factor
	1
Trust3	,775
Trust6	,761
Trust1	,738
Trust2	,595
Trust4	,580
Trust5	,479

Extraction Method: Principal Axis Factoring.

a. 1 factors extracted. 6 iterations required.

6.3.2 Reliability analyses trust

Reliability Statistics

Cronbach's Alpha	N of Items
,815	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Trust1	19,41	6,261	,644	,771
Trust2	18,73	7,575	,548	,795
Trust3	19,30	6,376	,689	,760
Trust4	19,23	6,620	,523	,803
Trust5	18,75	7,944	,431	,814
Trust6	18,93	6,659	,669	,766

6.4 Shared Values

6.4.1 Factor analyses shared values

Communalities

	Initial	Extraction
Visie1	,383	,546
Visie2	,377	,466
Visie3	,400	,501
Visie4	,457	,566
Visie5	,285	,400
Visie6	,445	,632

Extraction Method: Principal Axis

KMO and Bartlett's Test

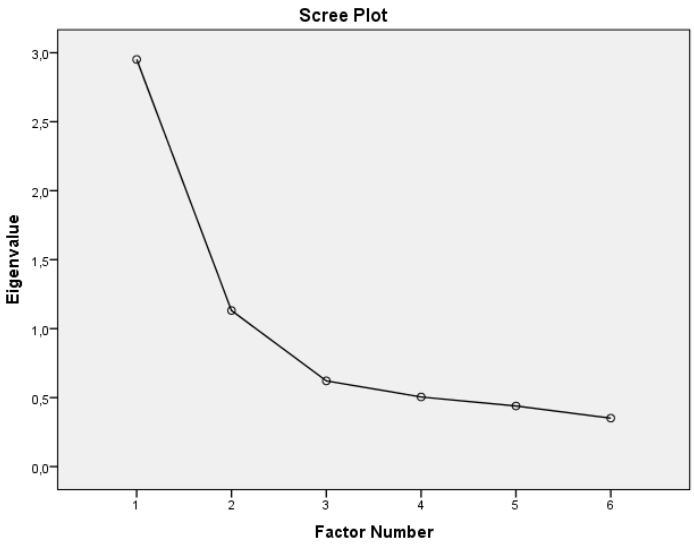
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,770
Bartlett's Test of Sphericity	Approx. Chi-Square	213,413
	Df	15
	Sig.	,000

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2,951	49,191	49,191	2,484	41,402	41,402	2,150
2	1,131	18,857	68,048	,628	10,461	51,864	1,820
3	,621	10,357	78,405				
4	,505	8,412	86,817				
5	,440	7,327	94,143				
6	,351	5,857	100,000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.



Factor Matrix[a]

	Factor	
	1	2
Visie4	,741	,128
Visie6	,696	,385
Visie3	,674	-,217
Visie1	,639	-,372
Visie2	,618	-,289
Visie5	,454	,440

Extraction Method: Principal Axis Factoring.

a. 2 factors extracted. 12 iterations required.

6.4.2 Reliability analysis shared values

Reliability Statistics

Cronbach's Alpha	N of Items
,789	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Visie1	18,64	5,314	,518	,763
Visie2	18,64	5,450	,532	,761
Visie3	18,73	4,800	,576	,749
Visie4	19,30	4,377	,661	,725
Visie5	19,01	5,592	,377	,793
Visie6	18,99	4,975	,596	,744

6.5 Information technology tools

6.5.1 Factor analysis IT-tools

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,625
Bartlett's Test of Sphericity	Approx. Chi-Square	310,622
	Df	36
	Sig.	,000

Communalities

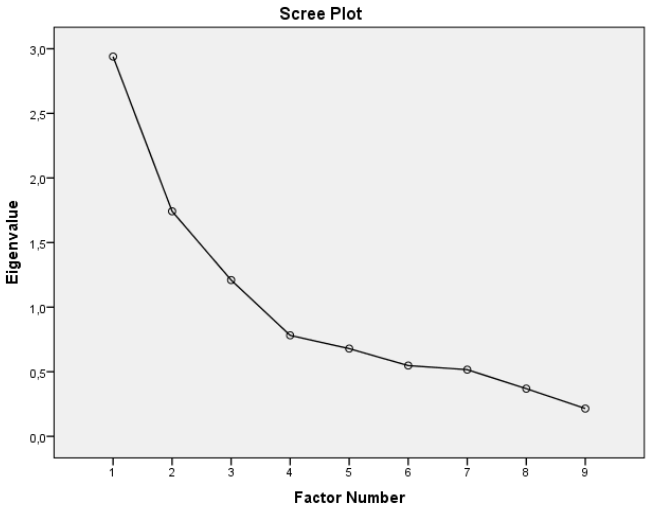
	Initial
ShaDoc1	,302
ShaDoc2	,453
ShaDoc3	,450
SupTo1	,233
SupTo2	,574
SupTo3	,302
SupTo4	,535
SupTo5	,402
SupTo6	,386

Extraction Method: Principal Axis Factoring.

Total Variance Explained

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2,940	32,662	32,662
2	1,742	19,356	52,017
3	1,210	13,440	65,458
4	,782	8,686	74,143
5	,679	7,546	81,690
6	,548	6,086	87,776
7	,516	5,734	93,510
8	,369	4,100	97,610
9	,215	2,390	100,000

Extraction Method: Principal Axis Factoring.



Factor Matrix[a]

a. Attempted to extract 3 factors. In iteration 25, the communality of a variable exceeded 1.0. Extraction was terminated.

6.5.2 Reliability analysis sharing documentation-tools

Reliability Statistics

Cronbach's Alpha	N of Items
,754	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ShaDoc1	6,36	3,877	,523	,750
ShaDoc2	6,63	2,880	,612	,636
ShaDoc3	6,56	2,394	,659	,586

6.5.3 Reliability analysis discussion facilitating tools

Reliability Statistics

Cronbach's Alpha	N of Items
,661	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SupTo1	6,79	4,618	,425	,605
SupTo2	6,99	5,040	,532	,587
SupTo3	6,22	4,062	,350	,665
SupTo4	6,86	4,522	,533	,567
SupTo5	6,81	4,963	,318	,645
SupTo6	7,08	5,865	,418	,642

Appendix 8 Code Tree

Knowledge sharing

- Definition
- Consciously use knowledge
- Reciprocity
- Attitude
- Importance
- Different content

Frequency of communication

- Goal of meeting
- Efficiency
- Type of contact (face-to-face vs. e-mail)
- Non-spontaneous
- positive

Trust

- misuse
- positive
- reciprocity
- Content
- Form of knowledge

Shared vision

- Consciously use knowledge
- Importance
- Similar levels

IT- tools

- Actual use
- Source of reference
- tool not the antecedent

Control variables

- age:
- years of employment:
- managerial position:

Other topics

- Direct vs. Indirect colleagues
- Reorganisation→ insecurity
- Motivation
- IQ
- Character

Appendix 9 Coding tables

9.1 Interview data on knowledge sharing

Respondent	Definition	Consciously use knowledge	Reciprocity	Attitude	Importance	Different ways
1	If I miss certain information than employees within this hospital that have that knowledge should be willing to provide it to me. The other way around I do not feel that I have the right to keep knowledge concerning operations from my colleagues. So it has to be open and transparent from both sides.	I never felt like colleagues kept operational knowledge from me. However, political and organizational knowledge is sometimes kept behind. In some cases this is understandable.	If I miss certain information than all employees within this hospital that have that knowledge should be willing to provide me this knowledge. The other way around I do not feel that I have the right to keep knowledge concerning operations from my colleagues.		Knowledge concerning skills…sometimes people have it, sometimes they don't. If I feel like I can help by sharing knowledge concerning these skills that's something I would do. We are all sharing the same task. How pointless it is to keep knowledge from those that help accomplish this task.	
2	Well, sharing your knowledge with your direct colleagues with whom you work a lot. And this is something you expect from your colleagues. There is something you know that others don't and the other way around. And that knowledge is shared.		Knowledge sharing should go both ways, that would be nice.	In general I think it is good. However people should be open to share knowledge. I feel like they are.	Sharing knowledge is part of your job and doing so makes your job easier. That's my opinion. I have a part time job and if you work together with more part-time employees than knowledge sharing is necessary and makes it more easy.	

3	For me knowledge sharing is gaining knowledge through multiple sources for example e-mail.	Keeping knowledge from others to consciously use it to reach a certain goal is something that happens within this organization. However, I enjoy transparency. By sharing knowledge people feel included and can learn how to deal with certain situations. On the other hand I can understand why sometimes knowledge is not shared.	You do notice if someone is or is not experienced. I do aske information from my experienced colleagues. I ask for their skills and knowledge.			
4	Well I see it as a group with whom you are working together , all with their own role within a project. An everybody has its own specific knowledge necessary to reach the goal of the project. Knowledge sharing primarily concerns a certain expertise which is shared.	Well maybe somebody choses to keep knowledge from others because of personal reasons. However, I am relatively new in this organization so something like this has not happened to me yet.			In my situation looking at the pharmacist, he has specific knowledge that is not important for me to know about. However some of that knowledge is necessary to reach the goal of the project, that knowledge should be shared.	There are several ways to share knowledge. Some people prefer informal, they are likely to quickly call somebody or just speak to someone in the hall way. Others prefer a formal way. I feel like the formal way of knowledge sharing is good at the moment.

9.2 Interview data on the frequency of communication

Respondent	Goal of meeting	Efficiency	Type of contact (face-to-face vs. e-mail)	Non-spontaneous	Inverted U-shaped
1	A while ago me and some colleagues decided we had to decrease the amount and length	I am inclined to say that I do not feel like a high frequency of communication might decrease knowledge sharing.			

	of meetings because it was just too much. Too much is never a good thing and in this case it was negative because we forgot the goal of meetings, we just had meetings because we agreed to.	However, when I think about it… there are some people that I do speak to that often and long that it has a negative influence on the knowledge that is shared. Your job should provide energy but in the case there are pointless meetings it will only cost energy.			
2		If you see each other more often, more knowledge will be shared.	I prefer face-to-face communication because often it is more clear than e-mail. Explaining and showing something during direct contact is often more clear. Through e-mail there is room for interpretation.		
3		At first I do not recognize how there can be too much communication in relation to knowledge sharing. However, within our team we used to have a meeting once a week for an hour and a half. But we had to limit It to once every two weeks. Because we felt like we did not always have enough to discuss so we weren't really efficient.	My employees do call every once in a while. However, the do prefer when I make my rounds on the policlinics to quickly ask or shared what they need to.		
4				At the moment I am sharing an office with my boss which makes it easy to share knowledge in an informal way. In the future there will be way more colleagues so then knowledge sharing will be way more formal at certain moments, it will be more strict. I feel like that might negatively influence the amount of knowledge that will be shared.	I do think this statement might be correct. When sharing knowledge with two individuals there is no problem. However when there is more people there will be a moment knowledge will not be shared with everyone.

9.3 Interview data on trust amongst colleagues

Respondent	misuse	Positive	Content	reciprocity	Form of knowledge
1			A distinction has to be made in the content of the knowledge that is shared. If I don't trust somebody that's no reason for me not to share knowledge concerning operations. However political or knowledge concerning strategy, that's a different story. That's knowledge that I would not share.	If you do not trust a person I think that person will also not trust you. That's noticeable in the chemistry between people. If that happens a horde to share knowledge is created.	
2		Yeah, trust certainly helps knowledge sharing. If you pleasantly collaborate with people and you trust them than you are more likely to share your knowledge.			I feel like documents and skills are types of knowledge you are equally likely to share with someone you trust. However, sharing documents is more easy.
3		I do think you receive more knowledge when trusted.		I think colleagues are also more willing to give you knowledge if they trust you.	
4	When sharing specific knowledge one will look at the dangers for themselves. Sometimes people have to fight for their position, they are vulnerable so they cannot share everything. If you do not trust a colleague you might be more careful with the knowledge you share. You might think twice before you send e-mails with important information in it because you cannot be sure if it will be used against you.	Trust certainly helps. I had a colleague at my previous job with whom I shared almost everything. So I certainly do agree with that statement. It is important to trust somebody in order to share knowledge, especially knowledge which can hurt you.	Content of knowledge is important when one is busy with their own position and possible damage that can be done to it. But this is not something I really recognize within the organization.		

9.4 Interview data on shared values amongst colleagues

Respondent	Importance	Consciously using knowledge	Similar levels
1		I do agree that a shared vision has a positive influence on the knowledge that is shared. I do recognize this statement because I have colleagues with whom I do not share the same vision. Because of this sometimes less knowledge is shared. If I feel it benefits my vision not to share knowledge then I won't share that knowledge. However, this is the case when it concerns organizational knowledge not when it concerns operational knowledge. We agreed to share operational knowledge so that's what I will do.	
2	There is no need to share knowledge with the people with whom I do not share a similar vision. Some colleagues just come to their job to make some money but not to achieve things. Sharing knowledge with those people is pointless because they won't be likely to use it. It won't cost me anything to share knowledge with those people but if it is not necessary I won't. If I know this person needs the knowledge I would share it.		If you have the same vision than you are on a similar level and you want to reach the same goal which makes it easier to share knowledge.
3			The more you share a vision, the more we are on similar levels and the more we trust one another this helps knowledge sharing.
4			I think sharing a vision always makes it more easy to work together. However, I do feel like there are a lot of people that do not share a vision about the way the organization must look like.

9.5 Interview data on the use of IT-tools

Respondent	Actual use	tool not the antecedent	Source of reference
1	We have several programs to share knowledge by chatting but those are barely used.		SharePoint does help with knowledge sharing, especially when there is something you need to look up. In that case you can be fairly sure that

	I feel like there is no need for more of these tools because than there will be an information overload.		everybody is working with the same information because there is only one document.
2	We do use SharePoint, in my case only because of MEVO. I also use shared disks which entails important documentation. Important documents are also spread through e-mail.		SharePoint is barely used however, everything is on there if you need it and it is available for everyone that has anything to do with it. So it is easy.
3	I do think for example SharePoint might help. However, I do feel like I have not worked with it enough yet. I do feel like knowledge sharing benefits from it.		SharePoint is an easy tool to bundle information, than it can be found in one place.
4	I do wonder if for example action lists from SharePoint are actually used. So I think it is mainly a great tool to create some structure for a project manager. However, I do feel like these tools might help knowledge sharing, we can take twitter and other social media as an example. Because the means are there more knowledge might be shared.	I feel like these tools might help in sharing knowledge, depending on the openness of the person planning to use these tools. I do feel like these tools do not result in more knowledge sharing but are just used when to share knowledge. It is still just a mean like sending a letter. However a tool might in the end also increase the amount of knowledge that is shared just because it is easier. Social media is an example of this	

9.6 Interview data on the control variables

Respondent	Age	Years of employment	Managerial position
1	I can imagine that older people do share less knowledge. Simply because of their experiences with live. Younger people tend to be less aware of possible risky situations. I feel like younger people are less aware of that fact that knowledge can be used against but also for you. Older people are more aware of this and therefore might chose not to share certain knowledge.	I do not work here that long but I do not feel like I am sharing less and less knowledge. But some people work here for more than 30 years I do not know how it is in their situation.	It depends on the type of leader whether they do or do not share less knowledge than other employees. Some do feel more connected to the operational employees and some are more tactically focused. So it depends on the managers ambitions.
2	I would say that the older one is the more knowledge he or she has to share. Looking at myself I cannot say that the amount of knowledge I share has increased by the years I have aged. I am still developing and gaining knowledge which in turn can be shared.	This relation feels similar than the one between age and knowledge sharing. The longer you are employed in this organization, the more knowledge you have to share. I would say, so the more knowledge you share.	I feel like it might be possible that managers share less knowledge. Maybe they are too busy or they do not feel like it is important? Or maybe they just have so much to do that they know many little bits of knowledge and forget to share it.

3	I do recognize that older people share less knowledge. Some of them just come and do their job. Nothing less and nothing more. More. I feel like the older they are the less motivated to do something extra. I feel like it also matters whether you are in the primary process within this organization or in a different function in which after several years there might still be some challenges.	I think I only recognize this because at one point your job becomes a routine and you might not even be aware of the fact that you for example do not share that much knowledge anymore.	I feel that in a managerial position it is also your task to build a network and that is not always done by sharing operational knowledge.
4	I do not recognize it looking at myself. However, I can imagine that older people share less knowledge. I feel like it has something to do with experience. When you are young, in the beginning of your carrier. You might not be aware of consequences certain actions might have. You might be somewhat naive. At some point, at a certain age I think people become that experienced that they know what to share and what not to share.	Again this has to do with experience and knowing how to use knowledge. After a while within an organization you know what the intentions of your colleagues are. The older you are the more careful you become.	It has to do with your position as a manager you might have to keep some information from others every once in a while because of your task. Also because of your position, which others might want to have, It might be better not to share knowledge. Especially no documented knowledge because that can more easily be hold against you.

9.7 Interview data on other topics

Respondent	Direct vs. Indirect colleagues	Reorganization	Motivation	IQ	Character
1	I do agree it would be different for direct or indirect colleagues. Just because I have a limited view on indirect colleagues because I do not see them that often.	I am not really bother by those situations but I do feel that colleagues in insecure situations become more restrained in what they do and do not share. They become shivery in their knowledge sharing to ensure their position. This is especially the case with people who are employed here for a long time. They are raised with a from cradle to crate mindset. When the situation occurs that the will not stay employed in the organization they started in, there mindset and perspective on the future has to change.			
2	I agree that it was difficult. How broad do I answer the questions? Knowledge is automatically shared with direct colleagues it just sort of happens.	Yeah maybe it does influence knowledge sharing, it is difficult to talk for others. Because all changes bring new opportunities however of course they can cost somebody their job. When somebody	If you like your job and you feel comfortable you are likely to be very motivated to do your job and share knowledge. I		

	Contact with indirect colleagues usually happens through e-mail. And if you do need each other than it concerns specific knowledge which you share but nothing else.	is afraid to lose their job I can imagine that they will stop sharing knowledge.	can imagine that if someone is not motivated and does not enjoy his or her job that knowledge sharing decreases.		
3	Knowledge sharing with direct and indirect colleagues is different. Sometimes we first brainstorm with direct colleagues before sharing certain knowledge with indirect colleagues. And there are different interests, which makes it difficult to answer questions.	Reorganizations cause insecurity and i chose to be transparent so everybody knows what is waiting for them. That way they can prepare and think ahead. As a result some people decrease the amount of knowledge they share. Others increase the amount of knowledge they share. It both happens.			
4	If you need to share knowledge with indirect colleagues that is something I would do however, it is easier and more automatic to share knowledge with direct colleagues.	I do think the insecurity makes people that want to keep their position share less knowledge.		Maybe the intelligence also influences the knowledge sharing of a person. Maybe people with a lower education are less aware how to use knowledge to benefit from it.	And maybe personality influences whether one does or does not share knowledge. Extrovert people are probably more likely to share as compared to introvert people.

Appendix 10 Syntax SPSS

```
* Comprimeren variabele opleidingsniveau*
DATASET ACTIVATE DataSet1.
RECODE Opleiding (5=2) (6=3) (7=1) (1 thru 4=1) INTO Opleiding_gecomprimeerd.
VARIABLE LABELS  Opleiding_gecomprimeerd 'Opleiding_gecomprimeerd'.
EXECUTE.

* Dummy HBO*
RECODE Opleiding_gecomprimeerd (2=1) (ELSE=0) INTO Dummy_HBO2.
VARIABLE LABELS  Dummy_HBO2 'Dummy_HBO2'.
EXECUTE.

* Dummy WO*
RECODE Opleiding_gecomprimeerd (3=1) (ELSE=0) INTO Dummy_WO2.
VARIABLE LABELS  Dummy_WO2 'Dummy_WO2'.
EXECUTE.

*nieuwe descriptives*
DESCRIPTIVES VARIABLES=Geslacht Leeftijd Dummy_HBO2 Dummy_WO2
/STATISTICS=MEAN STDDEV MIN MAX.

*compute knowledge sharing concept*
COMPUTE KnowShar_Gene=mean.3(Tacit1,Tacit2,Tacit3,Tacit4,Explicit1,Explicit2,Explicit3,Explicit4).
EXECUTE.

*compute IT-tools concept*
COMPUTE
IT_Tools=mean.3(ShaDoc1,ShaDoc2,ShaDoc3,SupTo1,SupTo2,SupTo3,SupTo4,SupTo5,SupTo6).
EXECUTE.

*Factor analyse kennisdeling. gekozen voor principal axis factoring omdat niet zeker normaal
verdeling en niet generaliseren buiten deze populatie*
FACTOR
  /VARIABLES Tacit1 Tacit2 Tacit3 Tacit4 Explicit1 Explicit2 Explicit3 Explicit4
  /MISSING LISTWISE
  /ANALYSIS Tacit1 Tacit2 Tacit3 Tacit4 Explicit1 Explicit2 Explicit3 Explicit4
  /PRINT INITIAL CORRELATION KMO EXTRACTION ROTATION FSCORE
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.
```

```
*Factor analyse frequency of communication. gekozen voor principal axis factoring omdat niet zeker normaal verdeling en niet generaliseren buiten deze populatie*
FACTOR
  /VARIABLES Frequency1 Frequency2 Frequency3 Frequency4
  /MISSING LISTWISE
  /ANALYSIS Frequency1 Frequency2 Frequency3 Frequency4
  /PRINT INITIAL CORRELATION KMO EXTRACTION ROTATION FSCORE
  /FORMAT SORT BLANK(.10)
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.

*Factor analyse trust. gekozen voor principal axis factoring omdat niet zeker normaal verdeling en niet generaliseren buiten deze populatie*
FACTOR
  /VARIABLES Trust1 Trust2 Trust3 Trust4 Trust5 Trust6
  /MISSING LISTWISE
  /ANALYSIS Trust1 Trust2 Trust3 Trust4 Trust5 Trust6
  /PRINT INITIAL CORRELATION KMO EXTRACTION ROTATION FSCORE
  /FORMAT SORT BLANK(.10)
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.

*Factor analyse Shared Vision. gekozen voor principal axis factoring omdat niet zeker normaal verdeling en niet generaliseren buiten deze populatie*
FACTOR
  /VARIABLES Visie1 Visie2 Visie3 Visie4 Visie5 Visie6
  /MISSING LISTWISE
  /ANALYSIS Visie1 Visie2 Visie3 Visie4 Visie5 Visie6
  /PRINT INITIAL CORRELATION KMO EXTRACTION ROTATION FSCORE
  /FORMAT SORT BLANK(.10)
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.
```

```
*Factor analyse Use of IT-tools. gekozen voor principal axis factoring omdat niet zeker normaal verdeling en niet generaliseren buiten deze populatie*
FACTOR
  /VARIABLES ShaDoc1 ShaDoc2 ShaDoc3 SupTo1 SupTo2 SupTo3 SupTo4 SupTo5 SupTo6
  /MISSING LISTWISE
  /ANALYSIS ShaDoc1 ShaDoc2 ShaDoc3 SupTo1 SupTo2 SupTo3 SupTo4 SupTo5 SupTo6
  /PRINT INITIAL CORRELATION KMO EXTRACTION ROTATION FSCORE
  /FORMAT SORT BLANK(.10)
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25) DELTA(0)
  /ROTATION OBLIMIN
  /METHOD=CORRELATION.

*test homoscedacity Explicit knowledge sharing*
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_Explicit
  /METHOD=ENTER Schaal_Frequency Schaal_Trust Schaal_Visie Schaal_ShaDoc Schaal_SupTo
  /RESIDUALS NORMPROB(ZRESID).

*test homoscedacity tacit knowledge sharing*
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_tacit
  /METHOD=ENTER Schaal_Frequency Schaal_Trust Schaal_Visie Schaal_ShaDoc Schaal_SupTo
  /RESIDUALS NORMPROB(ZRESID).

*Regressie analyse ten behoeve testen lineariteit tacit knowledge.*
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_tacit
  /METHOD=ENTER Schaal_Frequency Schaal_Trust Schaal_Visie Schaal_ShaDoc Schaal_SupTo
Dummy_vrouw
```

```
   Dummy_patientcontact Dummy_leidinggevende Dummy_LB Dummy_VMBO Dummy_VO
Dummy_MBO Dummy_HBO Dummy_WO
   Leeftijd Werkduur
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID).

*Regressie analyse ten behoeve testen lineariteit explicit knowledge.*
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_Explicit
  /METHOD=ENTER Schaal_Frequency Schaal_Trust Schaal_Visie Schaal_ShaDoc Schaal_SupTo
Dummy_vrouw
   Dummy_patientcontact Dummy_leidinggevende Dummy_LB Dummy_VMBO Dummy_VO
Dummy_MBO Dummy_HBO Dummy_WO
   Leeftijd Werkduur
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS HISTOGRAM(ZRESID) NORMPROB(ZRESID).

*Reliability analyse tacit knowledge sharing*
RELIABILITY
  /VARIABLES=Tacit1 Tacit2 Tacit3 Tacit4
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.

*Reliability analyse Explicit knowledge sharing*
RELIABILITY
  /VARIABLES=Explicit1 Explicit2 Explicit3 Explicit4
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.

*Reliability analyse frequency of communication*
RELIABILITY
  /VARIABLES=Frequency1 Frequency2 Frequency3 Frequency4
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.
```

```
*Reliability analyse trust*
RELIABILITY
  /VARIABLES=Trust1 Trust2 Trust3 Trust4 Trust5 Trust6
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.

*Reliability analyse sharded vision*
RELIABILITY
  /VARIABLES=Visie1 Visie2 Visie3 Visie4 Visie5 Visie6
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.

*Reliability analyse sharing documentation*
RELIABILITY
  /VARIABLES=ShaDoc1 ShaDoc2 ShaDoc3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.

*Reliability analyse discussion supporting tools*
RELIABILITY
  /VARIABLES=SupTo1 SupTo2 SupTo3 SupTo4 SupTo5 SupTo6
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE
  /SUMMARY=TOTAL.

*Descriptives van alle variabelen*
DESCRIPTIVES VARIABLES=Schaal_tacit Schaal_Explicit Schaal_Frequency Schaal_Trust Schaal_Visie
    Schaal_ShaDoc Schaal_SupTo Dummy_vrouw Leeftijd Dummy_LB Dummy_VMBO Dummy_VO
Dummy_MBO Dummy_HBO
    Dummy_WO Werkduur Dummy_patientcontact Dummy_leidinggevende
  /STATISTICS=MEAN STDDEV MIN MAX.

*Regressie model 1 met nieuwe dummy education*
REGRESSION
 /DESCRIPTIVES MEAN STDDEV CORR SIG N
 /MISSING LISTWISE
 /STATISTICS COEFF OUTS R ANOVA CHANGE
 /CRITERIA=PIN(.05) POUT(.10)
```

```
 /NOORIGIN
 /DEPENDENT Schaal_tacit
 /METHOD=ENTER Dummy_vrouw Leeftijd Dummy_HBO2 Dummy_WO2 Werkduur
Dummy_leidinggevende Dummy_patientcontact.

*Regressie model 2 met nieuwe dummy education*
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_tacit
  /METHOD=ENTER Dummy_vrouw Leeftijd Dummy_HBO2 Dummy_WO2 Werkduur
Dummy_leidinggevende Dummy_patientcontact Schaal_Frequency Schaal_Trust Schaal_Visie
Schaal_ShaDoc Schaal_SupTo.

*Regressie model 3 met nieuwe dummy education*
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_tacit
  /METHOD=ENTER Dummy_vrouw Leeftijd Dummy_HBO2 Dummy_WO2 Werkduur
Dummy_leidinggevende Dummy_patientcontact Schaal_Frequency Schaal_Trust Schaal_Visie
Schaal_ShaDoc Schaal_SupTo Frequency_Squared.


*Regressie model 4 met nieuwe dummy education*
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_Explicit
  /METHOD=ENTER Dummy_vrouw Leeftijd Dummy_HBO2 Dummy_WO2 Werkduur
Dummy_leidinggevende  Dummy_patientcontact.

*Regressie model 5 met nieuwe dummy education*
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
```

```
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_Explicit
  /METHOD=ENTER Dummy_vrouw Leeftijd Dummy_HBO2 Dummy_WO2 Werkduur
Dummy_leidinggevende Dummy_patientcontact Schaal_Frequency Schaal_Trust Schaal_Visie
Schaal_ShaDoc Schaal_SupTo.

*Regressie model 6 met nieuwe dummy education*
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Schaal_Explicit
  /METHOD=ENTER Dummy_vrouw Leeftijd Dummy_HBO2 Dummy_WO2 Werkduur
Dummy_leidinggevende Dummy_patientcontact Schaal_Frequency Schaal_Trust Schaal_Visie
Schaal_ShaDoc Schaal_SupTo Frequency_Squared.
```