KNOWLEDGE MANAGEMENT IN THE SEMI-PUBLIC SECTOR

Prerequisite organizational and human conditions for a successful implementation of knowledge management in a semi-public organization in the Netherlands

By

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ABSTRACT

There is a lack of available research that examines the relationship between enablers and knowledge management and its sub-variables knowledge creation, caption, dissemination and application. Most previous research focuses on examining the relation between enablers and knowledge dissemination. Moreover, previous research also showed that there could be differences between enablers of KM in (semi-) public and private sector organization. There is no standard model that can be applied to organizations in the (semi-) public sector and most previous research on KM is conducted in private sector organizations. Therefore, this master thesis examines which organizational and human conditions are prerequisite when successfully implementing knowledge management in semi-public organization X. The empirical research is conducted through a cross-sectional study, consisting of a survey and in-depth interviews with two employees and managers of the BU's of organization X. Formalization, training and leadership were found to significantly affect the level of KM in semi-public organization X. Moreover, none of the predictor variables are significant predictors of knowledge creation. Formalization, leadership and strategy are significant predictors of knowledge caption. Training is found to be a significant predictor of knowledge dissemination and formalization and strategy are significant predictors of knowledge application. Implications and recommendations based on these research outcomes are presented in this master thesis.

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LIST OF ABBREVIATIONS

BU	Business unit
BU 1	Business unit one
BU 2	Business unit two
BU 3	Business unit three
BU 4	Business unit four
BU 5	Business unit five
KM	Knowledge management
MT	Management team

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1. INTRODUCTION

There is an increasing emphasis on the importance of knowledge for organizations. Knowledge is seen as potential advantage of organizations to increase their organizational performance. Therefore, organizations try to effectively manage how knowledge is created, stored, shared and applied, also called knowledge management (KM). Effective KM may lead to more organizational benefits, such as improved organizational effectiveness (Choy Chong, Salleh, Noh Syed Ahmad & Syed Omar Sharifuddin, 2011), competitive advantage (Cong & Pandya, 2003; KPMG, 2000; Wang & Noe, 2010), and improved quality and efficiency (McAdam & Reid, 2000). In addition, the research of Omar Sharifuddin Syed-Ikhsan and Rowland (2004a) examined benefits of KM in the public sector. 77.9 percent of the respondents agree that managing knowledge improves the work quality. Other benefits that are mentioned are up-to-date information (76.6%), improved efficiency (75.5%), improved effectiveness (67.5%), improved decision making (66.9%) and to better respond to needs of clients (64.9%) (Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a). This corresponds with findings of Kim and Lee (2006) who argue that knowledge is an important resource in the public sector. In order to provide high quality services, it is important that knowledge sharing is effectively managed (Kim and Lee, 2006). Henttonen, Kianto and Ritala (2016) argue that knowledge is a key resource in the public sector, because it enables public sector organizations to provide knowledge services to clients and stakeholders.

Many scholars examined which variables are critical for a successful implementation of KM, to be able to improve the performance of organizations (e.g. Ismail Al-Alawi, Yousif Al-Marzooqi & Fraidoon Mohammed, 2007; Connelly & Kelloway, 2003; Heisig, 2009; Lee & Choi, 2003; Lin, 2007; Kim & Lee, 2006). These researches all show that different factors are significant predictors of one of the sub-variables of KM. Some researchers make a distinction between the level of importance of these enablers. McAdam and Reid (2000) examined perceptions of KM in public and private organizations. Their research shows that a majority of respondents, in both public and private organizations, indicate that “people related enablers” are considered most important in KM. The results in public sector organizations are the strongest, which indicates that people enablers are key to KM success in the public sector (McAdam & Reid, 2000). This is supported by the empirical research of Omar Sharifuddin Syed-Ikhsan and Rowland (2004a). 69.5 percent of the respondents in their research argue that individuals are most difficult to change when implementing KM (Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a). However, many organizations perceive technology as most important enabler. This narrow focus on information systems leads often to a failure of implementation projects, because organizations do not give sufficient attention to other enablers (Choy Chong et al, 2011; KPMG, 2000). As a result, employees are unmotivated because of information overload (Choy Chong et al, 2011), a lack of time to learn and a lack of training possibilities (KPMG, 2000). This is supported by the research of Lee and Choi (2003) which shows that a culture of trust and social collaboration, also called organizational enablers, are better predictors of knowledge creation than technology. This is supported by Young Choi, Sik Kang and Lee (2008). Their research shows that trust and rewards are better predictors of knowledge sharing than technology (Young Choi, Sik Kang & Lee, 2008). Individuals are the ones who possess knowledge and they are the ones who choose to create, capture, disseminate and apply knowledge (Henttonen, Kianto & Ritala, 2016). Without people

willing to embrace KM in the right organizational context, it is not possible to successfully implement KM (Lu, Leung & Koch, 2006; Yahya & Goh, 2002; Young Choi, Sik Kang & Lee, 2008). Thus, people and the organizational context are the key in successfully managing knowledge (Henttonen, Kianto & Ritala, 2016).

KM comprises the sub-variables knowledge creation, caption, dissemination and application (Heisig, 2009). However, the available literature highlights that a lesser extent of research is conducted which examines the relationship between enablers and knowledge creation, caption and application. Most previous research focuses on examining the relationship between enablers and knowledge dissemination (e.g. Connelly & Kelloway, 2003; Ismail Al-Alawi et al 2007; Kim & Lee, 2006; Lin, 2007; Tsai, 2002; Young Choi, Sik Kang & Lee, 2008). Whereas, only one research is found which examined the relation between enablers and KM (Yahya & Goh, 2002), one research is found that examined the relation between enablers and knowledge creation (Lee & Choi, 2003) and one research is found that examined the relation between enablers and knowledge use (Kulkarni, Ravindran & Freeze, 2007). No research is found which examined the relation between enablers and knowledge caption. This shows that there is a lack of available research on enablers of KM, knowledge creation, caption and application.

Furthermore, many research is conducted in private organizations, with few empirical studies on KM in the public sector in other countries than the Netherlands. No research is found which is conducted in semi-public organizations. However, various scholars highlight that KM might be different in public sector organizations (e.g. Buelens & Van den Broeck, 2007; De Gooijer, 2000; Liebowitz & Chen, 2003), because of differences between public and private sector organizations (e.g. Pollitt, 2003; Rainey, 1994). Rainey (1994) argues that public organizations have more constrains on extrinsic rewards, are more bureaucratic, less efficient than their private counterparts and rely more on appropriations of government (Rainey, 1994). In addition, Liebowitz and Chen (2003) argue that these differences also occur in relation to knowledge sharing. Knowledge sharing can be evoked by using rewards, which is not common in the public sector (Liebowitz & Chen, 2003). This is supported by Buelens and Van den Broeck (2007). Their empirical research shows that civil servants are less extrinsically motivated by salary than their private counterparts (Buelens & Van den Broeck, 2007). Furthermore, public sector organizations are often hierarchical and bureaucratic, which can make knowledge sharing more difficult (Liebowitz & Chen, 2003). De Gooijer (2000) also examined KM initiatives in previous literature, however, she concluded that there is no standard model that can be applied to organizations in the public sector. This is due to differences between the public and private sector, such as a more complex relation between service and client in the public sector, due to external stakeholders (De Gooijer, 2000). In contradiction, the research of Kim and Lee (2007) did not found differences in enablers of knowledge sharing between public and private sector organizations. They do argue that the organizational context of knowledge dissemination is different in public sector organizations. Public managers have to deal with more organizational constraints on knowledge dissemination, such as less rewarding systems, more centralization and formalization and lower levels of trust and social networks (Kim & Lee, 2007). Therefore, the differences between public and private sector organizations may show that the KM frameworks, as examined in previous research in private sector organizations, cannot be directly applied to (semi-) public sector organizations.

Therefore, based on the lack of available research it is difficult to define which conditions are necessary for an effective implementation of KM in the semi-public sector, because KM comprises more than only knowledge dissemination. Moreover, the available research indicates that there could be differences between enablers of KM in public and private sector organizations. Since the case study is a semi-public organization, they may even have to deal with different enablers of KM than public and private organizations. Less research is conducted on enablers of KM in (semi-) public organizations (in the Netherlands). Therefore, the aim of this study is to examine enablers of all sub-variables of KM in a semi-public organization in the Netherlands, to be able to successfully implement KM in this organization. The emphasis is on people and organizational enablers, because without people willing to embrace KM in the right organizational context, it is not possible to successfully implement KM. In addition, the organization also required that the emphasis of this research was on human and organizational enablers. Therefore, a single outcome study is conducted which examines the relationship between different human and organizational enablers and all sub-variables of KM in semi-public organization X in the Netherlands.

1.1 RESEARCH QUESTION

The research question of this paper is:

"*Which organizational and human conditions are prerequisite for a successful implementation of knowledge management in a semi-public organization in the Netherlands?".*

The dependent variable in this research is knowledge management, which consists of the sub-variables knowledge creation, caption, dissemination and application. The independent variables are organizational and human factors (culture, structure, strategy, rewards, leadership and training). The dependent and independent variables are further specified in paragraph 2.1. The semi-public organization X in the Netherlands serves as case study of this research, which is introduced in paragraph 1.2.

The aim of this research question is to examine which organizational and human enablers are prerequisite for a successful implementation of knowledge management in the (semi-) public sector. Moreover, the empirical research provides an understanding of important enablers for a successful implementation of KM in the semi-public organization X. In order to construct a feasible answer to this research question, three empirical sub-questions are defined:

1) What organizational and human conditions are, based on the theory, prerequisite for the (semi-) public sector when effectively implementing knowledge management?

The answer of this sub-question contributes to addressing the central question, because the literature review, of previous research,

help to define the theoretical framework and forms the basis for the formulation of the hypotheses, which are tested in the empirical research.

2) What organizational and human conditions are present in semi-public organization X?

The answer of this sub-question contributes to addressing the central question, because the empirical research examines to what extent the prerequisite human and organizational enablers are present in the case study.

3) What organizational and human conditions are, based on the empirical research, prerequisite for semi-public organization X, when effectively implementing knowledge management?

The answer of this sub-question contributes to addressing the central question, because it provides an overview of significant relations between enablers, as determined in sub-question one, and the dependent variable KM and it sub-variables. This sub-question provides an overview of the enablers that will help the semi-public organization in the Netherlands to successfully implement KM. In combination with the answer to sub-question 2, it provides clear recommendations of what the organization could do to successfully implement KM.

1.2 INTRODUCTION OF CASE STUDY

The case study of this research is a semi-public organization in the Netherlands. The organization under study, requested to keep their identity anonymous. Therefore, it is referred to as “semi-public organization X” or “organization X”. The unit of analysis are individuals in the five business units of the organization:

1) Business unit 1 (BU 1)
2) Business unit 2 (BU 2)
3) Business unit 3 (BU 3)
4) Business unit 4 (BU 4)
5) Business unit 5 (BU 5)

No information is provided about the main purpose of the organization and its business units, to keep the identity of the organization anonymous.

2. THEORY

This chapter provides the literature review, in which existing models and concepts relevant for KM and its enablers are discussed. Based on the literature review, a theoretical framework is provided which gives an answer to sub-question 1: *"What organizational and human conditions are, based on the theory, prerequisite for the (semi-) public sector when effectively implementing knowledge management?".*

2.1 LITERATURE REVIEW

This paragraph first outlines the concept of knowledge and KM, after which it focuses on organizational and human enablers.

Knowledge management

Knowledge management contains the words "knowledge" and "management". When defining knowledge, many scholars make a distinction between data, information and knowledge (e.g. Liebowitz & Megbolugbe, 2003; Yahya & Goh, 2002). Data is defined as raw facts, which do not have a meaning themselves. It is a method to store information and knowledge and data is used as input for information. Information is interpreted data, and serves as input for knowledge. When rules are applied to information, knowledge is created (Liebowitz & Megbolugbe, 2003; Yahya & Goh, 2002). Knowledge is perceived as a mix of experiences, values and contextual information. Yahya and Goh (2002) argue that knowledge and information are partly identical, but, information is sometimes more precise, while knowledge also comprises beliefs and commitments (Yahya & Goh, 2002). According to Tsoukas and Vladimirou (2001) data requires less human understanding, whereas for knowledge a greater extent of human understanding is necessary. According to Lee, Lee and Kang (2005) knowledge is very personal and most daily work is knowledge based. When organizations change, or reorganize, much knowledge is lost. This also applies when employees leave the organization; they take knowledge, skills and experiences with them (Lee, Lee & Kang, 2005).

When combining "knowledge" with "management" it is about directing knowledge in order to gain more organizational benefits. Organizations engage in KM because of improved organizational performance (Choy Chong et al, 2011; Liebowitz & Megbolugbe, 2003), innovation (Chourides, Longbottom & Murphy, 2003; de Gooijer, 2000; Donoghue, Harris & Weitzman, 1999; Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a), and improved efficiency and quality (McAdam & Reid, 2000). Some scholars emphasize differences in decisive factors to implement KM between public and private organizations. Private organizations are foremost interested in KM because of gaining competitive advantage (Cong & Pandya, 2003; KPMG, 2000; Wang & Noe, 2010), increasing market efficiency, creating a better customer focuses (KPMG, 2000) and increasing sales (McAdam & Reid, 2000). Whereas, public organizations are more willing to implement KM because of improved decision making, improved work quality, to be able to better respond to customer needs (Omar Sharifuddin Syed-Ikhsan & Rowland, 2004b) and because of external influences of government (Willem & Buelens, 2006). De Gooijer (2000) argues that public organizations have a more complex relation than only between customer and supplier, because external stakeholders are often involved, such as the government (De Gooijer, 2000). Furthermore, public organizations may be typified as knowledge-intensive organizations, in which it is important for them to

effectively manage knowledge sharing between different departments (Willem & Buelens, 2006). Finally, Cong and Pandya (2003) argue that KM does not only benefit organizations, but it also benefits individuals. KM may enhance individual skills and knowledge, which will increase personal performance and may enhance career development of individuals (Cong & Pandya, 2003).

Most scholars perceive KM as a variable with several sub-processes (e.g. Chourides, Longbottom & Murphy, 2003; Heisig, 2009; Omar Sharifuddin Syed-Ikhsan & Rowland, 2004b). Heisig (2009) analysed 160 KM frameworks, published between 1995-2003, to discover similarities and differences of the concept KM. He concluded that knowledge identification, knowledge creation, knowledge storing, knowledge dissemination and knowledge using are most frequently used as sub-processes of KM (Heisig, 2009). The knowledge management framework of Heisig (2009) is used as main structure of the conceptualization of KM, because it examined many frameworks on the conceptualization of KM. However, in this paper knowledge identification is not determined as sub-variable of KM, because, according to Nonaka (1994) knowledge identification is part of the knowledge creation process. Moreover, other scholars did not mention knowledge identification as separate process. Therefore, in this paper KM is defined as continuous cycle of business actions to undertake knowledge creation, caption, dissemination and application. This continuous cycle is important, because the variables are interdependent. It means that to be able to share knowledge, knowledge should be created and captured before it can be disseminated with others (Heisig, 2009).

KNOWLEDGE CREATION

Knowledge creation is often acknowledged as process of KM (Alavi & Leidner, 2001; Nonaka, 1994; Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a). According to Alavi and Leidner (2001) knowledge creation occurs, because tacit and explicit knowledge is transformed to new content, or existing content is replaced. Nonaka (1994) argues that knowledge creation is “a continual dialogue between explicit and tacit knowledge, which drives the creation of new ideas and concepts” (p. 15). Tacit knowledge is informal, practical knowledge, based on personal experience, values, perceptions and assumptions. This type of knowledge is difficult to express, because it is information that belongs to individual processes (Nonaka, 1994). It comprises automatic actions, like riding a bike (Smith, 2001) and is knowledge that it difficult to express in words (Lee, Lee & Kang, 2005). Tacit knowledge is frequently defined as “know-how”, whereas explicit knowledge is often defined as “know-what” (Kogut & Zander, 1992). Explicit knowledge is outlined in formal language, like manuals and processes. This knowledge is captured in words, recordings or images and is stored in databases and is accessible (Smith, 2001). In order to understand explicit knowledge a certain level or understanding trough formal training is necessary (Lee, Lee & Kang, 2005).

The research of Nonaka (1994) is well known for its continuous cycle of four modes; i.e. socialization, externalization, combination and internalization, which describes the process of knowledge creation. The first mode is socialization, where knowledge is created by transforming existing tacit knowledge to new tacit knowledge between individuals (Nonaka, 1994). Existing tacit knowledge is transferred to new tacit knowledge by gathering tacit knowledge from internal and external sources. Information should be collected through engaging in dialogue with competitors and by collecting information inside the firm. Finally, socialization comprises the dissemination of tacit knowledge between individuals (Nonaka et al

1994; Nonaka & Konno, 1998). The second mode of knowledge creation is combination, which refers to the transformation from existing explicit knowledge to new explicit knowledge. This phase focuses mainly on three processes. The first refers to the caption and integration of new explicit knowledge from in and/or outside the organization. The second process focuses on sharing this knowledge with individuals by presentations or meetings for example. Finally, explicit knowledge needs to be edited or processed in order to make it usable and understandable (Nonaka & Konno, 1998). The third mode is externalization, which focuses on transforming tacit knowledge to new explicit knowledge. Tacit knowledge has to be translated into understandable knowledge, that can be understood by other individuals. Externalization is encouraged by two processes. First, the transformation from tacit into explicit knowledge. This is supported by techniques such as metaphors and dialogues. The second process is translating the tacit knowledge into understandable knowledge. This is supported by deductive and inductive reasoning and exchanging ideas (Nonaka & Konno, 1998). The final mode is internalization, which refers to creating tacit knowledge from explicit knowledge. Employees should be able to determine which knowledge is important for them, which depends on two factors. First, it depends on personal experience. Explicit knowledge should be incorporated in action and practice. It should be represented in organizational processes like strategy, innovation and improvement by training of individuals. Second, it depends on simulation and experimentation. There should be a process of embodying explicit knowledge, by using simulations for example (Nonaka & Konno, 1998).

Each mode has a corresponding “ba”, which contains concrete steps for creating and enhancing individual and organizational knowledge (Nonaka & Konno, 1998). The first is the “originating ba”, which enhances the socialization mode. Knowledge creation will be stimulated if individuals share experiences and emotions through physical contact with other individuals. An open culture is very important, because it stimulates face-to-face contact between individuals. Second, the “interacting ba”, which enhances the externalization mode. Project teams, consisting of people with different knowledge, will help to convert tacit knowledge to explicit knowledge, by using processes of dialogue and collaboration, which in turn will enhance knowledge creation. Third, the “cyber ba”, which enhances the combination mode. Organizations should implement a virtual place of interaction. Here, new explicit knowledge is combined with existing explicit knowledge by using information technology, like networks, intranets, databases et cetera. Finally, the “exercising ba”, which enhances the internalization mode. Companies should enhance individual learning, which can be encouraged by training for managers and employees on how to use formal knowledge. Overall, it depends on organizational effort and organizational design whether or not knowledge creation occurs in an organization (Nonaka, 1994; Nonaka & Konno, 1998).

KNOWLEDGE CAPTION

The second process of KM is knowledge caption (Heisig, 2009). Various scholars acknowledge knowledge storing (Alavi & Leidner, 2001), capturing (e.g. Bennett & Gabriel, 1999; Chourides, Longbottom & Murphy, 2003; Omar Sharifuddin Syed-Ikhsan & Rowland, 2004b; Smith & Farquhar, 2000) or knowledge embodiment (McAdam & Reid, 2000) as process of KM. Knowledge caption or knowledge storing means embodying knowledge in documentation, databases, organizational procedures and processes, so that it is stored and accessible for individuals (Alavi & Leidner, 2001). According to McAdam and Reid (2002) knowledge caption is important because knowledge becomes accessible to more than one individual, which in turn enables knowledge dissemination and application, which is necessary for gaining benefits

from applying KM. They argue that it depends on several factors whether or not knowledge is effectively captured. First, it depends at which level knowledge is captured. Knowledge should be actively captured and embodied in different forms in all organizational levels, to make sure that knowledge is not lost. Second, it depends on who is responsible for capturing knowledge, where all employees should be responsible for capturing knowledge, so that it actually occurs. Finally, it depends on how explicit and tacit knowledge is captured in the organization. Embodying tacit knowledge is supported by informal discussion and meetings between employees, where explicit knowledge needs to be stored in databases, processes, documents et cetera, so that it is accessible for all individuals. Finally, knowledge embodiment can be further enhanced if good and bad experiences are reported and evaluated (McAdam & Reid, 2000).

KNOWLEDGE DISSEMINATION

According to Heisig (2009), knowledge dissemination or sharing is the third process of KM, which is supported by many scholars (e.g. Alavi & Leidner, 2001; Darroch, 2003; McAdam & Reid, 2000; Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a; Smith & Farquhar, 2000). Knowledge dissemination is defined as the process of exchanging and processing knowledge from one unit to another. This will provide new knowledge to individuals, which will allow them to apply this knowledge and may therefore enhance their work processes, efficiency and work quality (Lee, Lee and Kang, 2005). Bock, Zmud, Kim and Lee (2005) also argue that it depends on the willingness of individuals whether or not knowledge is shared. Lee, Lee and Kang (2005) argue that the degree of knowledge dissemination is measured by core knowledge sharing and knowledge sharing. Core knowledge sharing measures the extent to which individuals share their knowledge with other individuals. Effective knowledge dissemination will enable individuals to improve their task efficiency. Knowledge sharing measures if knowledge dissemination is promoted in the organization and whether or not information systems are in use to disseminate knowledge (Lee, Lee & Kang, 2005).

KNOWLEDGE APPLICATION

Knowledge application is the final aspect of KM (Heisig, 2009). Knowledge application means that individuals use knowledge in their daily work processes, which may improve task efficiency and organizational efficiency (Gold, Malhotra & Segars, 2001; Mohammad et al, 2012). Gold, Malhotra and Segars (2001) argue that it is often assumed that once knowledge is created, stored and shared, that knowledge will be actively applied. However, they argue that knowledge application does not occur automatically, it is a task that should be actively carried out by employees. They argue that there should be knowledge application processes, which are "*processes oriented towards the use of knowledge"* (Gold, Malhotra & Segars, 2001, p. 195). Knowledge application can be useful to solve problems and may improve individual and organizational efficiency. Knowledge application will be encouraged if an organization has determined knowledge application processes. These processes define when and how knowledge should be applied. Moreover, knowledge application is encouraged if it improves efficiency (Gold, Malhotra & Segars, 2001).

Enablers of knowledge management

Many scholars empirically researched which variables are critical success factors of sub-variables of KM. For example, Kim and Lee (2006) examined the impact of the organizational context and IT on employee's

perceptions of knowledge dissemination in the public and private sector. Their empirical research shows that social networks, centralization, reward systems, IT usage and easy to use IT systems are all significant predictors of knowledge sharing (Kim & Lee, 2006). Lee and Choi (2003) empirically examined enablers of knowledge creation. They concluded that a culture of trust and social collaboration are significant predictors of knowledge creation (Lee & Choi, 2003). The research of Connelly and Kelloway (2003) also examined which organizational factors influence the employee's perception of knowledge sharing. Their empirical research shows that culture, available technology and management support are all significant predictors of knowledge sharing (Connelly & Kelloway, 2003). Moreover, Young Choi, Sik Kang and Lee (2008) researched which socio-technological enablers influence the level of knowledge sharing. They concluded that trust and rewards, called social enablers, are more important enablers of knowledge sharing than technological support (Young Choi, Sik Kang & Lee, 2008). The empirical results of these researches show that different enablers are significant predictors of sub-variables of KM. This is supported by the research of Heisig (2009). He analysed 160 KM frameworks and tried to discover correspondences and differences of enablers in these frameworks. He concluded that variables such as culture, people and leadership are most often mentioned as critical success factors in these frameworks, followed by organizational structure, processes, strategy and technology (Heisig, 2009). McAdam and Reid (2000) examined perceptions of KM in public and private organizations. Their research shows that a majority of respondents in both public and private organizations indicate that people related enablers are considered most important in KM. The results in the public sector are strongest, which indicates that people enablers are key to successfully implement KM in the public sector. This is supported by the empirical research of Omar Sharifuddin Syed-Ikhsan and Rowland (2004a). They examined perceptions of enablers of knowledge sharing in the public sector. 69.5 percent of the respondents in their research argue that individuals are most difficult to change when implementing KM (Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a). Still, many organizations perceive technology as important enabler. This narrow focus on information systems leads often to a failure of implementation projects, because organizations do not give sufficient attention to other enablers (Choy Chong et al, 2011; KPMG, 2000). As a result, employees are unmotivated because of information overload (Choy Chong et al, 2011), a lack of time to learn and a lack of training possibilities (KPMG, 2000). This is supported by the research of Lee and Choi (2003) which shows that a culture of trust and social collaboration, also called organizational enablers, are significant predictors of knowledge creation, whereas technology is no significant predictor of knowledge creation. Even when an organization has a perfect technological architecture, without people willing to embrace KM in the right organizational context, it is not possible to successfully implement KM (Lu, Leung & Koch, 2006; Yahya & Goh, 2002; Young Choi, Sik Kang & Lee, 2008). Scholars argue that employees are most important in knowledge-intensive organizations, because the success depends on the knowledge and dedication of people. People are the ones who acquire the specific knowledge (Depassé & Roi, 2009), and they are the ones who choose to create, capture, disseminate and apply knowledge (Donoghue, Harris & Weitzman, 1999). Therefore, the focus in this research is on organizational and human enablers that are prerequisite for implementing KM in the (semi-) public sector. In this literature review multiple enablers are discussed. The framework of Heisig (2009) is used as standard, but this is enhanced with the enablers rewards and training, because these are mentioned in more than three reviewed researches on KM.

ORGANIZATIONAL CULTURE

The empirical research of Heisig (2009) shows that culture is most often mentioned as enabler of KM. Organizational culture can be defined as the shared values, norms and practices of individuals in an organization (De Long & Fahey, 2000; McDermott & O'Dell, 2001). Values are deeply rooted in the organization and are very difficult to change. Norms are derived from values, but are "more observable and easier for employees to identify" (De Long & Fahey, 2000, p. 115). Practices are most visible and are easiest to change in an organizational culture (De Long & Fahey, 2000).

Scholars argue that knowledge sharing and knowledge creation are encouraged by a culture of trust (Ismail Al-Alawi et al, 2007; Kim & Lee, 2006; Lee & Choi, 2003; Young Choi, Sik Kang & Lee, 2008). Kim and Lee (2006) argue that individuals who trust the skills, knowledge and abilities of their colleagues are more willing to share knowledge. It becomes easier to share knowledge if employees trust their colleagues, because they are confident that the knowledge will be used well (Kim & Lee, 2006). The level of trust in other colleagues depends on two aspects: cognition- and affect-based trust (Kim & Lee, 2006; Lewis & Weigert, 1985; McAllister, 1995). Cognition based trust means that people trust colleagues based on good reasoning and evidence of trustworthiness. Previous experiences with colleagues (Lewis & Weigert, 1985) and competence, responsibility, reliability and dependability (McAllister, 1995) will define the level of cognitive trust. Affect-based trust comprises the emotional bonds between individuals. Here it depends on the social and emotional relationships between individuals (Lewis & Weigert, 1985). Kim and Lee (2006) expected a positive relationship between a culture of trust and knowledge dissemination. However, their empirical research did not show a significant relation between a culture of trust and knowledge dissemination. It means that culture does not have an effect of the level of knowledge dissemination (Kim & Lee, 2006). In addition, Ismail Al-Alawi et al (2007) also expected a positive relationship between a culture of trust and knowledge sharing. They argue that if people trust the promise or actions of colleagues, they are more likely to share knowledge. Their empirical research shows a significant positive relationship between trust and knowledge sharing. Therefore, they argue that organizations should focus on organizing social events, to further increase trust between colleagues (Ismail Al-Alawi et al, 2007). Young Choi, Sik Kang and Lee (2008) also expected that a culture of trust positively influences knowledge sharing. Their empirical research also shows a significant positive relationship between trust and knowledge sharing. Moreover, according to Lee and Choi (2003) trust means the confidence in someone else's intention and behaviours. A culture of trust may enhance knowledge creation, because when people trust each other's intention and behaviour, they are more willing to create and share knowledge, which is especially important in cross-functional or interorganizational teams (Lee & Choi, 2003). Therefore, Lee and Choi (2003) expected a positive relationship between a culture of trust and knowledge creation. Their empirical research did show a significant positive relation between the level of trust and knowledge creation (Lee & Choi, 2003). The research of Lee and Choi (2003), Ismail Al-Alawi et al (2007) and Young Choi, Sik Kang and Lee (2008) show that **a culture of trust positively influences the level of knowledge creation and dissemination**. Whereas the research of Kim and Lee (2006) did not found a significant relationship between a culture and trust and knowledge dissemination.

Moreover, Kim and Lee (2006) argue that a culture of social networks also enhances knowledge dissemination. Social networks or informal networks enhance interactions and dialogues that support

knowledge sharing activities. Informal or social networks are not part of the organizational structure, but are networks that exist because people have shared interests or passion for a specific subject. In these networks knowledge is created and shared because of meetings, conversations, presentations et cetera., and more informal contacts are established, which is important for disseminating knowledge (Kim & Lee, 2006). Therefore, Kim and Lee (2006) expected a positive relationship between a culture of social networks and knowledge dissemination. Their empirical research shows a significant positive relationship between social networks and knowledge dissemination. Based on this finding, they suggest that public managers should enhance interactions and contact between employees in the same department, as well as cross-sectional (Kim & Lee, 2006). Connelly and Kelloway (2003) examined the influence of different enablers and personal characteristics on knowledge sharing. They also argue that social networks enhance knowledge sharing, because it strengthens the social interaction between employees. More social interaction is important because employees will become more knowledgeable about colleagues, and therefore know better whom to approach in case of a problem. Moreover, they also argue that more social interaction leads to a higher level of trust between colleagues, which again enhances knowledge sharing. Their empirical research shows a positive significant relationship between a culture of social networks and knowledge dissemination (Connelly & Kelloway, 2003). Finally, Lee and Choi (2003) argue that collaboration enhances knowledge creation. Collaboration may help people to develop a shared understanding of problems and work related issues. Collaboration increases the social network of individuals, because it becomes easier to communicate and collaborate. Their empirical research shows a significant positive relation between collaboration and knowledge creation. They argue that it is important that social groups collaborate in order to enhance knowledge creation (Lee & Choi, 2003). These research outcomes show that **a culture of social networks and collaboration positively influence knowledge creation and sharing** (Connelly & Kelloway, 2003; Kim & Lee, 2006; Lee & Choi, 2003).

ORGANIZATIONAL STRUCTURE

Different authors argue that organizational structure is an important enabler of KM (e.g. Heisig, 2009; 2006; Kim & Lee, 2006; Lee & Choi, 2003; Pertusa-Ortega, Zaragoza-Sáez & Claver-Cortés, 2010; Tsai, 2002). According to Heisig (2009), "structure" is mentioned in 18.5 percent of the frameworks as enabler of KM. An organizational structure provides a control and coordinating mechanism for all organizational elements (Pertusa-Ortega, Zaragoza-Sáez & Claver-Cortés, 2010; Walker, Boyne & Brewer, 2012). In this paper, the study of Hage and Aiken (1967) is used for the conceptualization of organizational structure, because it has proven to be most influential in bureaucracy studies (Dewar et al, 1980). Moreover, Kim and Lee (2012) and Lee and Choi (2003) also used the study of Hage and Aiken (1967) in their researches. According to Hage and Aiken (1967) an organization is structured by means of elements that show how positions are arranged in the organizational structure. Variables that define an organizational structure are: formalization, complexity and centralization (Hage & Aiken, 1967). Because it is argued that the level of formalization and centralization influence the use of KM (Kim & Lee, 2012; Lee & Choi, 2003), these two concepts of organizational structure are discussed in this paper and the concept of complexity is left out.

Formalization

According to Hage and Aiken (1967), formalization means "*the use of rules in an organization"* (p. 79). A high level of organizational rules corresponds with a high formal organizational structure. Hage and Aiken

(1967) distinguish two constructs of formalization: job codification and rule observation. The former refers to the number of job specific tasks that are defined in organizational rules and regulations, also called job descriptions (Hage & Aiken, 1967). Walker, Boyne and Brewer (2012) refer to *"the degree of work standardization"* as synonym for job codification (p. 93). The second element of formalization is rule observation. This measures whether or not employees obey the rules. It focuses on the extent to which organizations monitor and control rule compliance (Hage & Aiken, 1967). Dalton et al (1980) argue that job codification determines what employees are expected to do, whereas rule observation observe how they do it. Therefore, it is argued that a formalized organization has a high level of job codification (many rules and regulations that describe organizational processes) and a high level of rule observation (control mechanisms to monitor and control if employees obey the rules). An informal organizational structure has low levels of job codification, less rules and regulations that describe organizational processes and low levels of rule observation (Walker, Boyne & Brewer, 2012).

Kim and Lee (2006) argue that a formal organizational structure decreases knowledge sharing, because it limits the possibility of individuals to communicate and interact with colleagues. KM requires flexibility and less emphasis on rules, whereas new ideas seem to be restricted when there are formal rules who determine work processes. Variation and openness, will encourage developing new ideas, whereas a formal structure constraints individuals from sharing information with each other (Kim & Lee, 2006). Therefore, Kim and Lee (2006) expected a negative relationship between the level of formalization and knowledge sharing. The empirical research shows first of all that the level of formalization and centralization is slightly higher in public organizations than in corporations and that public managers face more difficulties in their ability to improve employee knowledge-sharing capabilities (Kim & Lee, 2006). However, the empirical research of Kim and Lee (2006) did not found any significant results that supported their hypothesis that *"the degree of formalization is negatively associated with employee knowledge-sharing capabilities"* (Kim & Lee, 2006, p. 374). In addition, Lee and Choi (2003) argue that knowledge creation is limited, when there are rules and processes which determine work processes. Less rules and regulations help to increase interaction between individuals. Knowledge creation will be enhanced by informal communication and interactions, indicating an informal organizational structure. Therefore, they also expected a negative relationship between formalization and knowledge creation processes. They argue that knowledge creation requires flexibility and less rules and regulations. However, their empirical research shows a non-significant relation between formalization and knowledge creation (Lee & Choi, 2003). Pertusa-Ortega et al (2010) expect that a high formal organizational structure positively influences knowledge performance, which contradicts with the research of Kim and Lee (2006) and Lee and Choi (2003). This hypothesis is based on the idea that rules and regulations may guide organizational procedures and therefore will enhance KM. Without any guidance, individuals will not be able to use new knowledge due to disorganization, infrequency and inefficiency. Formalization can guide the structure and procedures necessary for interactions that will lead to knowledge creation. Moreover, rules and regulations define what type of knowledge individuals need to share. However, the empirical research of Pertusa-Ortega, Zaragoza-Sáez and Claver-Cortés (2010) shows a non-significant relation between formalization and knowledge performance. This means that they cannot confirm that a formalized organizational structure positively influences knowledge performance. These outcomes show that **Kim and Lee (2006), Lee and Choi (2003) and Pertusa-Ortega et al (2010) all failed to prove a**

significant relation between formalization and knowledge creation, knowledge sharing and performance.

Centralization

According to Hage and Aiken (1967) the degree of centralizations shows "*how power is distributed among social positions"* (p. 77). Walker, Boyne and Brewer (2012) argue that the degree of centralization is used to determine how decisions on resources, policies and objectives are made. Moreover, it is also used to determine whether or not individuals are allowed to make work decisions, called the degree of hierarchical authority (Walker, Boyne & Brewer, 2012). Tsai (2002) argues that the level of centralization shows whether the authority for decision making lies in higher or lower organizational levels. Hage and Aiken (1967) distinguish two constructs of centralization: hierarchy of authority and the degree of participation in decision making. The former focuses on decisions that individuals can take in social positions. If employees are authorized to make work related decisions, then there is low level of hierarchy of authority for social control. However, it also occurs that all work-related decisions have to be approved by someone higher in the hierarchy, which shows a high level of hierarchy and authority. The second construct of centralization is the degree of participation in decision making. It shows whether or not individuals participate in decisions about resources and organizational policies (Hage & Aiken, 1967). A centralized organization has a high degree of hierarchy and authority and low levels of participation in decision making. A decentralized organization has a low degree of hierarchy and authority and high levels of participation in decision making (Walker, Boyne & Brewer, 2012).

Kim and Lee (2006) argue that a decentralized organizational structure positively affect knowledge sharing. It is argued that no participation in decision making reduces knowledge sharing, because there is little input from lower levels. Moreover, a centralized organizational structure will limit cross-sectional communication and knowledge sharing (Kim & Lee, 2006). Kim and Lee (2006) used a five-item scale of centralization, as determined by Hage and Aiken (1967), to measure the degree of hierarchy of authority and participation in decision making. Their empirical research statistically supports that a centralized organizational structure diminishes knowledge sharing capabilities of individuals. Therefore, they suggest that public managers should focus on a participatory approach, to promote flexibility and encourage knowledge sharing and interorganizational collaboration (Kim & Lee, 2006). In addition, Tsai (2002) also expected that a centralized organizational structure negatively influences knowledge sharing. They used three items on decision making to measure the level of centralization. The empirical research shows a significant negative relationship between centralization and knowledge sharing. The higher the level of control, the less individuals are willing to share knowledge with other colleagues (Tsai, 2002). Pertusa-Ortega et al (2010) also argue that a centralized organization limits the knowledge performance of organizations. Their empirical research also shows a negative significant relation between centralization and knowledge performance, thus indicating that a high level of centralization limits knowledge performance. They argue that decentralization positively influence knowledge sharing, because individuals, at lower levels, will be involved in decisions, this leads to more ideas and may therefore improve knowledge performance (Pertusa-Ortega et al, 2010). Finally, Lee and Choi (2003) expected a negative relationship between centralization and knowledge creation, because centralization reduces creative solutions and hinders cross-sectional collaboration and communication. Their empirical research

shows that there is a negative significant relation between centralization and knowledge creation (Lee & Choi, 2003**).** These research outcomes show that **centralization has a negative influence on knowledge creation, sharing and performance** (Kim & Lee, 2006; Lee & Choi, 2003; Tsai, 2002: Pertusa-Ortega et al, 2010).

ORGANIZATIONAL STRATEGY

According to Heisig (2009), strategy is mentioned in 39.5 percent of the frameworks as critical success factor of KM. This is supported by Omar Sharifuddin Syed-Ikhsan and Rowland (2004a). Their empirical research shows that 96.8 percent of the respondents argue that it is important to have a KM strategy. It will clarify the role of employees in KM and it will also link the KM strategy to the overall organizational strategy. They argue that such a strategy should focus on how knowledge should be captured and shared among employees (Omar Sharifuddin Syed-Ikhsan and Rowland, 2004a). According to Cen (2004) an organization should have a clear understanding why they are planning to implement KM, what they want to achieve and how they want to achieve it. This strategy will guide organizations in the processes of implementing and embedding KM, because it will help employees to understand why this change is happening. Such a strategy should consist of a mission, a vision and strategy. A KM mission focuses on "why" KM is important, a KM vision should focus on "what" the organization strives for and the strategy will define "how" KM will be implemented and embedded in the organization (Cen, 2004). In addition, Uit Beijerse (1999) also argued that a strategy is important for successful KM, because it shows individuals why they are performing certain actions and what it gives them in return. These researches all address the importance of strategy as enabler of KM, but did not examine the statistical relationship between strategy and (sub-variables of) KM. The research of Kim and Lee (2006) did empirically examine the influence of a vision and goals on knowledge sharing. They argue that a clear organizational vision shows the purpose of knowledge sharing, which assists in goal achievement. However, their empirical research did not found a significant relation between vision and goals and knowledge sharing (Kim & Lee, 2006). Even though the literature emphasizes the importance of a KM strategy, **no empirical research is found that empirically examined the relationship between strategy and sub-variables of KM**. Only Kim and Lee (2006) examined the influence of vision and goals on knowledge sharing. They did not found a significant relationship between these variables.

REWARDS

Some scholars also argue that rewards is an important enabler of sub-variables of KM (e.g. Kulkarni, Ravindran & Freeze, 2007; Lin, 2007; Young Choi, Sik Kang & Lee, 2008).

Lin (2007) conducted an empirical research in which the influence of rewards on knowledge sharing is examined. Lin (2007) argues that employees can be motivated by rewards. He distinguishes between extrinsic and intrinsic rewards. The former focuses on goal-driven reasons, which are the rewards or benefits that someone receives when performing an activity. It depends on expected organizational rewards and reciprocal benefits whether or not individuals share knowledge. Expected organizational rewards may range from monetary rewards, like bonuses to non-monetary rewards, such as promotions and job security. Employees will be motivated to share knowledge if they believe that they will receive an organizational reward in return. Furthermore, reciprocal benefits may also determine whether or not individuals share knowledge. Individuals will acquire a cost-benefit analysis in order to determine if the

perceived extrinsic benefits are higher than the efforts, like time and mental effort. If the perceived benefits exceed the costs, individuals are more likely to share knowledge. Intrinsic rewards refer to inherent rewards and pleasure, like public recognition. Individuals will share knowledge because it will benefit themselves in terms of satisfaction derived from the experience or because of the enjoyment of helping others. It depends on the level of self-efficacy and enjoyment in helping others, whether or not individuals share knowledge. Self-efficacy focuses on the ability of individuals to judge their capabilities to execute action towards knowledge sharing. Finally, individuals may enhance in knowledge sharing because they enjoy helping others (Lin, 2007).

Lin (2007) argues that intrinsic and extrinsic rewards both positively influence knowledge sharing. The empirical research shows a significant positive relationship between reciprocal benefits and knowledge sharing, knowledge self-efficacy and knowledge sharing and enjoyment in helping others and knowledge sharing, whereas there is no significant relationship between expected organizational rewards and knowledge sharing. Therefore, he suggests to not use organizational rewards as enabler of knowledge sharing, because it gives only temporary results, whereas the other aspects of intrinsic and extrinsic rewards can be used to influence knowledge sharing (Lin, 2007). Young Choi, Sik Kang and Lee (2008) also argue that employees can be motivated by using rewards. They expect that both intrinsic and extrinsic rewards positively influence the level of knowledge sharing. Their empirical results show a positive significant relationship between intrinsic rewards and knowledge sharing and extrinsic rewards and knowledge sharing. Important to note is that the relationship between intrinsic rewards and knowledge sharing is stronger (Young Choi, Sik Kang & Lee, 2008). In addition, the empirical research of Ismail Al-Alawi et al (2007) and Kim and Lee (2006) also show that there is a significant positive relationship between rewards and knowledge dissemination (Ismail Al-Alawi et al, 2007; Kim & Lee, 2006). Finally, Kulkarni, Ravindran and Freeze (2007) examined the influence of different organizational enablers on the level of knowledge use. They argue that incentives lead to a higher level of knowledge application. Their empirical research significantly supports the relationship between incentives and knowledge application, the higher the level of incentives, the more individuals apply knowledge (Kulkarni, Ravindran & Freeze, 2007). These results show that **rewards (intrinsic rewards and reciprocal benefits) are significant predictors of knowledge sharing and knowledge application** (Lin, 2007; Ismail Al-Alawi et al, 2007; Kulkarni, Ravindran & Freeze, 2007; Young Choi, Sik Kang & Lee, 2008).

TRAINING PROGRAMS

Some scholars also argue that training programs is an important enabler of sub-variables of KM (e.g. Lu, Leung & Koch, 2006; Yahya & Goh, 2002; Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a; Omar Sharifuddin Syed-Ikhsan & Rowland, 2004b). Omar Sharifuddin Syed-Ikhsan and Rowland (2004a) examined perceptions on the benefits, enablers and technological aspects of KM in the public sector. Their empirical research shows that 68.2 percent of the respondents perceive training as important enabler of KM (Omar Sharifuddin Syed-Ikhsan & Rowland, 2004a).

Lu, Leung and Koch (2006) examined the relation between employee factors and organizational factors on knowledge sharing. They argued that training is very important when implementing knowledge sharing, because it educates people with the necessary skills and knowledge, which is required for knowledge dissemination. They examined the influence of organizational support, consisting of the constructs

training, manager's attitude and sanctions, on knowledge sharing. Their empirical research failed to find a significant relationship between organizational support and knowledge sharing. However, they did not measure the individual relation between training and knowledge sharing (Lu, Leung & Koch, 2006). Yahya and Goh (2002) empirically examined the relation between training and KM. Their empirical research shows a positive significant relation between sub-variables of training and KM. They argue that organizations should develop quality training to enhance the level of KM. This training should focus on team building, providing skills and techniques related to KM, effective cooperation, leadership skills and managing change. Moreover, they argue that it is also important to discuss the company mission and values in these trainings. It shows employees how KM is related to a company's strategy. Furthermore, they argue that it is important that skills such as documentation skills, problem solving techniques are trained, because these are important enablers of knowledge creation, caption and dissemination (Yahya & Goh, 2002). In addition, Omar Sharifuddin Syed-Ikhsan and Rowland (2004b) argued that organizations should provide training to enhance the knowledge and skills of employees. Employees should understand the meaning and implications of knowledge sharing and what actions they need to perform in order to actively disseminate knowledge. However, their empirical research failed to find a significant relationship between training and knowledge dissemination (Omar Sharifuddin Syed-Ikhsan & Rowland, 2004b). This finding contradicts with the research outcome of Yahya and Goh (2002). A possible explanation is that the variable "training" in the research of Yahya and Goh (2002) consists of much more specific and detailed measures. Some of the sub-variables of training in their research also show a non-significant relationship, whereas other do show a significant relationship. Therefore, **it is expected that training is an important enabler of knowledge management** (Yahya & Goh, 2002).

LEADERSHIP

According to Heisig (2009), leadership is mentioned in 18.5 percent of the frameworks as enabling factor of KM. This is supported by Yang, Huang and Hsu (2014). They distinguish three sub-variables of knowledge leadership; skills, cooperation and integration. Leadership skills means that higher management should understand the meaning and implications of knowledge sharing and take an exemplary role, which will help to motivate employees to disseminate knowledge. Leadership cooperation means that managers should be able to create an environment of cooperation, which may enhance knowledge sharing. Knowledge integration means that managers should be able to integrate knowledge in daily processes and innovate resources regarding knowledge sharing. They expected that these three determinants of knowledge leadership positively influence knowledge dissemination. Their empirical research showed that leadership skills and leadership integration are significant predictors of knowledge sharing, whereas leadership cooperation is not a significant predictor of knowledge dissemination. However, they do argue that previous researches did found a significant effect between leadership cooperation and knowledge dissemination. Based on their findings, they indicate that managers should understand the meaning and implications of KM, to be able to take an exemplary role. Moreover, they should enhance and stimulate employees to disseminate knowledge and they should integrate practical experience of different departments to create new knowledge (Yang, Huang & Hsu, 2014). Connelly and Kelloway (2003) also argue that leadership is an enabler of knowledge sharing. They argue that employees may look for symbols, such as managers, when sharing knowledge. Moreover, if employees perceive that management is not very committed to knowledge sharing, then it is less likely

that employees will share knowledge. Their empirical research shows that the perceptions about management support is a significant predictor of knowledge sharing. Therefore, they argue that it is important that managers show their support for knowledge sharing (Connelly & Kelloway, 2003). In addition, Kulkarni, Ravindran and Freeze (2007) argue that leadership is an important enabler of knowledge use. They indicate that managers can influence actions that are necessary to apply KM, moreover they can promote knowledge sharing and use and set the norms and expectations. They argue that KM is complex and therefore, more commitment of managers show employees the benefit and potential of knowledge use, which may enhance employees to use knowledge. Their empirical research shows that leadership has a significant positive effect on knowledge use (Kulkarni, Ravindran & Freeze, 2007). These outcomes show that **leadership is a significant predictor of knowledge sharing and use** (Connelly & Kelloway, 2003; Kulkarni, Ravindran & Freeze, 2007; Yang, Huang & Hsu, 2014).

2.2 THEORETICAL FRAMEWORK

The literature review provides an answer to sub-question one: "*What organizational and human conditions are, based on the theory, prerequisite for the (semi-) public sector when effectively implementing knowledge management?".*

First of all, the literature review shows that most research examines the relation between enablers and knowledge dissemination. Only one research is found which examines the relation between enablers and KM (Yahya & Goh, 2002), one research is found that examines the relation between enablers and knowledge creation (Lee & Choi, 2003) and one research is found that examines the relation between enablers and knowledge use (Kulkarni, Ravindran & Freeze, 2007). No research is found which examines the relation between enablers and knowledge caption. This shows that there is a lack of available research on enablers of KM, knowledge creation, caption and application. Therefore, the available research on enablers of knowledge dissemination is also used to determine enablers of KM, knowledge creation, caption and application.

The first enabler that is mentioned as enhancer of KM is organizational culture (Heisig, 2009). The research of Ismail Al-Alawi et al (2007) shows a significant positive relationship between a culture of trust and knowledge dissemination. They argue that if people trust the promise or actions of colleagues, they are more likely to share knowledge (Ismail Al-Alawi et al, 2007). In addition, the empirical research of Lee and Choi (2003) also shows a positive significant relationship between the level of trust and knowledge creation. A culture of trust may enhance knowledge creation, because when people trust each other's intention and behavior, they are more willing to create and share knowledge (Lee & Choi, 2003). Kim and Lee (2006) also expected that a culture of trust positively influences the level of knowledge sharing. It becomes easier to share knowledge if employees trust their colleagues, because they are confident that the knowledge will be used well. However, their research failed to significantly prove this relation (Kim & Lee, 2006).

Moreover, Lee and Choi (2003) argue that collaboration also enhances knowledge creation. Their empirical research shows a positive significant relationship between the level of collaboration and knowledge creation. In addition, the empirical researches of Connelly and Kelloway (2003), Ismail Al-Alawi et al (2007) and Kim and Lee (2006) show a positive significant relation between a culture of social

networks and knowledge dissemination. In these networks knowledge is shared because of meetings, conversations, presentations et cetera. More informal contacts are established, which is important for disseminating knowledge (Kim & Lee, 2006). These outcomes show that a culture of trust and social networks are significant predictors of knowledge creation and knowledge dissemination. No research is found that examines the relation between a culture of trust and social networks and KM, knowledge caption and application. Therefore, it is assumed, based on the findings of the researches of Al-Alawi et al (2007), Connelly and Kelloway (2003), Lee and Choi (2003) and Kim and Lee (2006), that a culture of trust and social networks, called a KM culture, positively influences KM and its sub-variables (knowledge creation, caption, dissemination and application).

> **H1:** A knowledge management culture has a positive effect on the perceived level of application of knowledge management

The research of Kim and Lee (2006), Lee and Choi (2003) and Pertusa-Ortega et al (2010) also mention that formalization is an important enabler of sub-variables of KM. Some scholars expected a negative relation between the level of formalization and sub-variables of KM (e.g. Kim & Lee, 2006; Lee & Choi, 2003), whereas others expected to find a positive relationship between these variables (Pertusa-Ortega et al, 2010). However, the research of Kim and Lee (2006), Lee and Choi (2003) and Pertusa et al (2010) all failed to significantly prove a relationship between formalization and sub-variables of KM. Even though these researches did not found a significant relationship between these variables, this research still examines the influence of formalization on sub-variables of KM. The theoretical background provides a logical ground that formalization may influence KM. Therefore, it is expected that formalization influences the level of KM and its sub-variables (knowledge creation, caption, dissemination and application). However, since there is no consensus on the direction of the relationship, a non-directional hypothesis is formulated:

> **H2A:** A formalized organizational structure has an effect on the perceived level of application of knowledge management

The level of centralization also defines the organizational structure. The researches of Kim and Lee (2006), Tsai (2002) and Pertusa-Ortega et al (2010) all show that there is a negative significant relationship between the level of centralization and knowledge dissemination. It means that a centralized organizational structure negatively influences knowledge dissemination. No research is found which empirically examined the relation between the level of centralization and knowledge creation, caption and application. Therefore, it is assumed that the level of centralization negatively influences the KM and its sub-variables (knowledge creation, caption, dissemination and application).

> **H2B:** A centralized organizational structure has a negative effect on the perceived level of application of knowledge management

The third enabler of KM is strategy. According to Cen (2004) a KM strategy will guide organizations in the processes of implementing and embedding KM, in which it will also help employees to understand why this change is happening. The research of Kim and Lee (2006) did empirically examine the influence of an organizational vision on knowledge sharing. They argue that a clear organizational vision shows the purpose of knowledge sharing, which assists in goal achievement. However, their empirical research did

not found a significant relation between vision and goals and knowledge sharing (Kim & Lee, 2006). Moreover, no empirical research is found that examined the relationship between strategy and knowledge creation, caption and application. Still, since many researches address the importance of a KM strategy, it is assumed that there is a relation between strategy and KM. Based on the theoretical review, it is expected that a KM strategy will positively influence the perceived level of implementation of KM and its sub-variables (knowledge creation, caption, dissemination and application).

> **H3:** A knowledge management strategy has a positive effect on the perceived level of application of knowledge management

A KM strategy comprises the sub-variables mission, vision and strategy.

The fourth enabler of KM is rewards. Lin (2007) and Choi, Sik Kang and Lee (2008) examined the influence of intrinsic and extrinsic rewards on knowledge sharing. These researches show a positive significant relationship between intrinsic and extrinsic rewards and knowledge sharing, where Lin (2007) argues that reciprocal benefits (part of extrinsic rewards) is not a significant predictor of knowledge dissemination. The research of Kulkarni, Ravindran and Freeze (2007) examined the overall influence of rewards on knowledge application. Their empirical research shows a significant relationship between rewards and knowledge application (Kulkarni, Ravindran & Freeze, 2007). No empirical research is found that examines the relationship between rewards and knowledge creation and caption. Therefore, it is assumed that intrinsic and extrinsic rewards have a positive effect on KM and its sub-variables (knowledge creation, caption, dissemination and application).

> **H4:** Rewards has a positive effect on the perceived level of application of knowledge management

The fifth enabler of KM is training. In order to successfully implement KM, it is important to provide employees with adequate training, because it educates people with the necessary skills and knowledge, which is required for knowledge dissemination (Lu, Leung & Koch, 2006). The empirical research of Lu, Leung and Koch (2006) failed to find a significant relationship between organizational support and knowledge sharing. However, they did not measure the individual relation between training and knowledge sharing (Lu, Leung & Koch, 2006). In addition, the research of Omar Sharifuddin Syed-Ikhsan and Rowland (2004b) also did not found a significant relationship between training and knowledge dissemination. The research of Yahya and Goh (2002) does show a positive significant relationship between training and the sub-variables of KM. They argue that organizations should develop quality training to enhance the level of KM (Yahya & Goh, 2002). Since the research of Yahya and Goh (2002) examined the relation between training and KM much more detailed, it is assumed that training positively influences the perceived level of application of KM and its sub-variables (knowledge creation, caption, dissemination and application).

> **H5:** Training has a positive effect on the perceived level of application of knowledge management

The final enabler of KM is leadership. Yang, Huang and Hsu (2014) argue that leadership positively influences KM. They distinguish three sub-variables of knowledge leadership; skills, cooperation and integration. Their empirical research shows that leadership skills and leadership integration are significant

predictors of knowledge performance, whereas leadership cooperation does not contribute significant to knowledge performance. However, they do argue that previous researches did found a significant effect. Moreover, the research of Connelly and Kelloway (2003) also shows a positive relation between management support and knowledge sharing. In addition, the research of Kulkarni, Ravindran and Freeze (2007) also show a positive effect between leadership (support) and knowledge application However, no empirical research is found that examined the relationship between leadership and knowledge creation and caption. Therefore, it is assumed that leadership skills, cooperation and integration, also called KM leadership, positively influences the perceived level of application of KM and its sub-variables (knowledge creation, caption, dissemination and application).

> **H6:** KM leadership has a positive effect on the perceived level of application of knowledge management

These hypotheses comprise the theoretical framework as visualized in figure 1.

Figure 1: overview theoretical framework

3. RESEARCH METHODOLOGY

This chapter provides an overview of the research methodology. The research design, choice of study and data collection methods are discussed.

3.1 RESEARCH DESIGN

A cross-sectional study, among the five organizational units of organization X, is carried out to examine the relation between the independent variables (culture, structure, strategy, rewards, leadership and training) and the dependent variable KM.

A cross-sectional study involves observations of a sample that are made at one point at a time (Babbie, 2007). These observations are useful to examine the relationship between the predictor variables and the dependent variable KM. Moreover, these observations determine the current situation of the five organizational units of organization X. The outcomes of the multiple regression, in combination with the overview of the current situation, provide a solid ground for the recommendations for semi-public organization X to successfully implement KM. The outcomes of the multiple regression also reduce the lack of available empirical research on enablers of KM. The cross-sectional study in this empirical research consists of two parts: (1) a questionnaire and (2) in depth interviews with employees and managers of the organizational units.

The questionnaire collected many data on the perceptions, knowledge and thoughts of respondents on KM and its enablers, which in case of interviews would have cost very much time. It is a useful method to provide insight in the similarities and differences between the organizational units. Moreover, it also provides the data necessary for testing the hypotheses. The second part of the cross-sectional study are interviews with employees and managers of the organizational units. These interviews serve as exploratory measure to clarify differences or unclear outcomes in the survey responses of the five organizational units. A combination between these two methods is very useful, because the survey collects perceptions of all the employees on KM and its enablers, whereas the interview focuses on in-depth information.

3.2 DATA COLLECTION

In this study, both original quantitative and qualitative data is used to test the defined hypotheses. Data is collected through sequential data gathering. First quantitative data is collected by means of a survey, followed by in-depth interviews with managers and employees of the business units.

Quantitative research

For the quantitative research a questionnaire is constructed, based on the conceptualization and operationalization of the variables mentioned in the theoretical framework (see appendix A). For the

survey measures of the dependent and independent variables, this paper follows prior research of several scholars. The content validity is established by adopting constructs that are already been validated.

The questionnaire consists of three parts. The first part comprises general questions on gender, age, level of seniority et cetera., to determine the demographic profile of the respondents. The second part of the questionnaire measures perceptions of employees of the dependent variable KM and its sub-variables. The final part on the questionnaire measures employee's perceptions of the independent variables. For the second and third part of the questionnaire, multiple-item measures are used for all of the variables to improve reliability and validity. Each item is rated on a seven-point Likert scale: consisting of the attributes strongly agree (1) to strongly disagree (7), also called an operational measure. A complete overview of the survey items is provided in appendix B.

The second part of the survey measures perceptions of the dependent variable KM, which consists of four sub-variables; knowledge creation, knowledge caption, knowledge dissemination and knowledge application. The first sub-variable is knowledge creation, which is assessed by using the SECI model of Nonaka et al (1994). This model is used because this work has been widely adopted by many scholars. Knowledge creation comprises four sub dimensions: socialization, combination, externalization and internalization. These dimensions are assessed by using a 27-item scale adopted from the research of Nonaka et al (1994). The reliability score of these items is tested with Cronbach's alpha. The Cronbach's alpha is 0.914, which indicates a high level of internal consistency. The second sub-variable is knowledge caption, which is assessed by using a 7-item scale, two items of McAdam and Reid (2003) and five items of the research of Liebowitz and Megbolugbe (2003). The Cronbach's alpha is 0.804, indicating a high level of internal consistency. The third sub-variable is knowledge dissemination. Seven items are used to measure knowledge dissemination. The reliability of these items was assessed by Cronbach's Alpha which was 0.662. The final sub-variable of KM is knowledge application. This item is assessed by using a 7-item scale adapted from the research of Gold, Malhotra and Segars, 2001. The reliability of these items was 0.83. These four variables together comprise the variable "KM", which comprises 48 items. The Cronbach's alpha is 0.943, which indicates a high internal consistency.

The final part of the questionnaire measures perceptions of the independent variables. The first independent variable is organizational culture, which is distinguished in two dimensions; a culture of trust and social networks (Kim & Lee, 2006). Trust is assessed by using a nine-item scale adapted from the research of McAllister (1995) and Kim and Lee (2006). The level of social networks is measured by three items of Kim and Lee (2006). The Cronbach's alpha of the variable "culture" is 0.879, but, the internal consistency will be raised to 0.920 if item OCSN3 ("I actively participate in communities of practice") is deleted from the scale. However, item OCSN3 is not removed, because these items are based on the empirical research framework of Kim and Lee (2006), which has proven to be a reliable scale (Cronbach's alpha was 0.85).

The second independent variable is organizational structure, which comprises two variables: the level of formalization and centralization. Formalization is the degree to which organizational processes are written down in documents, procedures, regulations and manuals (Hage & Aiken, 1967). It is measured by two constructs. The first construct is the level of job codification, which is measured by four items of Hage and Aiken (1967). The second variable is rule observation, and is measured by three items of Hage and

Aiken (1967). Item OSFO6 was negatively formulated, therefore this items have been reversed recoded. The Cronbach's alpha of the items of organizational structure is 0.776, which indicates a reliable scale. Centralization is the second variable of organizational structure. The study of Hage and Aiken (1967) is used to define the indicators measuring centralization. The first construct, participation in decision making, is measured by six items of Hage and Aiken (1967). The second construct is the degree of hierarchy of authority, which is measured by four items of Hage and Aiken (1967). Items OSCE_P1, OSCE_P2, OSCE_P3, OSCE_P4, OSCE_P5 and OSCE_P6 were negatively formulated, therefore these items have been reversed recoded. The Cronbach's alpha of these items is 0.836, which indicates a high level of internal consistency.

Strategy is the third independent variable. It comprises the variables mission, vision and strategy. Uit Beijerse (1999) developed four items to determine the strategy level of an organization. One item about short and medium-term strategies is used, to define five items on mission, vision and strategy. The Cronbach's alpha of these items is 0.907, which indicates a high level of internal consistency.

The fourth independent variable is rewards. Rewards can be distinguished in intrinsic and extrinsic rewards. The study of Lin (2007) argues that the dimension extrinsic rewards can be measured in two parts; expected organizational rewards and reciprocal benefits. Expected organizational rewards is measured with one item and reciprocal benefits with four items. All indicators are based on the framework of Lin (2007). The study of Lin (2007) argues that the dimension intrinsic rewards can be measured in two parts; the level of self-efficacy and enjoyment in helping others. The level of self-efficacy is measured with four items, whereas enjoyment in helping others is measured with three items. All indicators are based on the framework of Lin (2007). The Cronbach's alpha of the variable "rewards" is 0.861, which indicates a high level of internal consistency.

The fifth independent variable is "training". Six items were adopted from the research of Lu, Leung and Koch (2006) to measure the level of training. One item is splitted into two items, because of compound construct. The Cronbach's alpha is 0.683, which proves to be a reliable scale.

The final independent variable is leadership, which comprises three constructs. The first one is "leadership skills", which is measured by four items of Davenport and Prusak (1998). The second construct of leadership is leadership integration, which is measured by two items of Davenport and Prusak (1998). The final construct of the variable leadership is "leadership cooperation", which is measured by 5 items of Davenport and Prusak (1998). The Cronbach's alpha of the variable "leadership" is 0.943, which indicates a high internal consistency.

Qualitative research

For the qualitative research, in-depth interviews with managers and employees of the organizational units are held. The interviews serve as exploratory measure to clarify differences or unclear outcomes in the survey responses of the five organizational units. It also tries to explain (remarkable) outcomes between function levels. Therefore, not all sub-variables of KM and independent variables are discussed in the interviews. Moreover, these interviews do not only have a scientific value, but these interviews will also lead to an improvement of the situation of the subjects being investigated. The information is used to give recommendations on which enablers are prerequisite for organization X to successfully implement KM.

The survey was already very extensive, therefore, a limited number of interviews is carried out. The survey showed differences in outcomes between the organizational units and differences in outcomes between the management team (MT) and employees. Therefore, the working environment and function level were the selection criteria of interview participants. Important to note is that due to the time between the data collection of the survey and the interview, some organizational changes were introduced, which affected the unit of analysis. BU 2 will stop existing, and the four employees will move to other BU's. At the time of the data collection of the interviews, this change was not yet completed. Therefore, no interviews are carried out with employees of the original BU 2, because the organizational change is not yet implemented.

First of all, all MT members were interviewed, where four have the function of BU-manager, and one MT member is CEO. Furthermore, two employees per BU are interviewed, to control for differences between BU's. Only one employee of BU 4 is interviewed, because of its small size. Because interviews were carried out with MT members and employees, it allowed to control for differences in function level. Moreover, two team assistants are interviewed to further control for differences in function level. Interviewees were also selected based on whether or not they cooperated in one of the KM work groups. These groups are all responsible for a sub-part of the KM framework in the organization, which assumes that these persons have more knowledge about the subject and may have a different opinion. In order to control for possible differences between people, based on the cooperation in these work groups, one person per BU was selected based on cooperation in the work group and one person was selected based on no cooperation. Based on this distinction, people were randomly selected to participate in the interviews. Except for the differences in function, BU outcomes, and cooperation in KM work groups, no further selection criteria were used. The survey already controlled for many criteria, such as age, gender, seniority et cetera., and no differences were found in outcomes between these criteria. The only differences that was found were differences between BU's and differences in function level, which are both controlled for in these interviews. Table 1, shows an overview of the interview participants per BU, were the different function levels are also mentioned.

BU 1	BU 3	BU 4	BU 5	MT
2 employees 1 BU-manager (also MT member) 1 team assistant	2 employees 1 BU-manager (also MT member)	1 employee 1 MT member	2 employees 1 BU-manager (also MT member) 1 team assistant	1 CEO

Table 1: overview of interviews

Semi-structured interviews were used, because these are very useful to obtain information that may clarify remarkable outcomes in the BU's and per function level. By using open questions, the interview focuses on the topic of research, and participants could name dimensions they find important. As already mentioned, the interview topics/questions were based on (remarkable) outcomes in the survey at business unit level and between different functions. In paragraph 4.1 an analysis of the survey results is provided. Based on these outcomes, interview questions were developed, which are shown in appendix C. This appendix shows an overview per BU of which subjects needed further clarification. The interview questions are based on remarkable outcomes at business unit level, therefore, subjects were only asked

to identify the situation in their BU. This means that interview concepts differ per BU. However, the same questions were used if the concept returned in more than one BU.

The interviews all started with a brief introduction about the purpose of the interview, the use of a voice recorder and the level of confidentiality. All interviews were recorded and after transcribing the interview, the results were shared with the participants for approval. All interview transcriptions were approved by the participants.

4. RESULTS

This chapter provides an overview of the survey and interview results and the outcomes of the multiple linear regression.

4.1 SURVEY RESULTS

This paragraph starts with an overview of the demographic profile of respondents and the analysis of missing respondents. Moreover, it contains an explanation of how the survey data is analysed and the results from the data analysis of the dependent and independent variable.

Demographic profile

The survey was administered to 104 employees, from which a total of 67 employees returned the survey, giving a response rate of 64 percent. Incomplete questionnaires were not used. Among the 67 respondents, 19 (28.4 percent) were female and 48 respondents were men (71.6%). Respondent ages ranged from younger than 30 to over 60, with 76.2 percent of the respondents over the age of 40. Most respondents were aged between 40-49 (43.3 percent). Employees of organization X are highly educated, 94.1 percent acquire a higher professional education or higher, where most respondents indicate that they acquire a university degree (62.7 percent). Most respondents belong either to BU 1 (32.8 percent) or BU 5 (32.8 percent). 17.9 percent of the respondents belong to BU 3, six percent of the respondents are part of BU 2, and nine percent of the respondents belong to BU 4. Furthermore, the respondents are also grouped per function level. The functions are grouped in five categories; management team, sector managers, managers, team assistants and the final category other functions. Most respondents indicate to fall in the category “manager” (61.2%). 7.5 percent of the respondents indicate to be part of the management team, 6 persons (9 percent) argue that they are sector managers. The smallest group are the team assistants with 4.5 percent and the final category “other functions” consists of 12 respondents (18%). A total demographic overview of the respondents is provided in appendix D.

In order to make sure that no important data or employee groups are left out, an analysis of the missing respondents is carried out, by using the Chi-square goodness of fit test. This test is useful to determine whether the sample distribution is the same as the general distribution. In appendix E, the outcomes of the Chi-square goodness of fit test are provided. The sample distribution is compared with the general distribution on gender, age, function level and business unit. The exact significance value is used for the variables function level and business unit, because the expected cells were less than five. All outcomes show a P value of higher than 0.05. Therefore, the null hypothesis cannot be rejected (H0: the sample distribution is the same as the general distribution). The differences between the sample distribution and general distribution are non-significant. Thus, indicating that there are no differences in gender, age, function level and business unit between the sample distribution and general distribution.

Overview of data analysis

Multiple-item measures are used to measure the dependent and independent variables. Each item is rated on a seven-point Likert scale, consisting of the attributes strongly disagree (1) to strongly agree (7). Moreover, respondents could also indicate that they “do not know” (coded as 9 in SPSS). Important to

note is that all multiple item measures are perceptual measures and therefore measured the perceived current situation of the dependent and independent variable.

Based on these multiple-item measures, different constructs were computed to measure the mean scores and distributions of the constructs and variables (using compute mean in SPSS). For example, the overall scores on all constructs of knowledge creation are being averaged, to obtain the scores for knowledge creation. Appendix F provides an overview of which items were used to compute the different constructs and variables. However, because the answer category "do not know" was coded as 9, the mean scores and distributions increased. Recoding this category from "9" to "0", results in mean scores and distributions that are too low. Therefore, the "do not know" category is treated as missing response, to make sure that this category does not influence the mean outcomes and distributions of the constructs and variables. When analysing the outcomes, the category "do not know", treated as missing value, is sometimes important for the analyses of the data. Therefore, the missing values are reported per construct or variable if there are any. The distribution of the answers is then always provided with and without the missing values.

Dependent variable: knowledge management

The dependent variable in this research is knowledge management. This concept comprises four variables: knowledge creation, knowledge caption, knowledge dissemination and knowledge application.

	Mean	Median	Mode	STD	Variance	Min	Max
Knowledge management	4.967	5.043	5.47*	.743	.552	3.44	6.38
Knowledge creation	5.004	5.192	4.04*	.817	.668	3.19	6.50
Knowledge caption	4.306	4.429	4.57	1.159	1.343	1	6.71
Knowledge dissemination	5.294	5.286	5.14*	0.702	.493	3.57	6.86
Knowledge application	4.834	4.857	6	.982	.965	2.86	6.80

Scale: 1 = strongly disagree, 2 = disagree, 3 = partly disagree 4 = neither disagree nor agree 5 = partly agree, 6 = agree, 7 = strongly agree

*** Multiple modes exist. The smallest value is shown.**

Table 2: descriptives dependent variable knowledge management

Knowledge creation is measured by the constructs: socialization, combination, externalization and internalization. Appendix G, provides a total overview of the survey outcomes per construct. These results show that a majority of respondents agree that the processes socialization, combination, externalization and internalization all occur in their BU. The averages of outcomes of knowledge creation varied from 3.19 to 6.50 in a possible range of scores from 1 (strongly disagree) to 7 (strongly agree). The mean of the construct knowledge creation is 5.004, indicating that respondents agree that knowledge creation occurs. Indeed, most respondents (71.6 percent) perceive that knowledge creation occurs in their business unit. This shows that most respondents imply that knowledge is created by transforming tacit or explicit knowledge to new content or by replacing existing knowledge. 20.9 percent of the respondents neither agree nor disagree and 7.5 percent disagree that knowledge creation occurs. Table 3 provides an overview of the mean scores of the perceived level of knowledge creation per BU.

Knowledge creation			
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
BU 1	4.5	22.6	72.9
BU 2	0	50	50
BU 3	16.7	25	58.3
BU 4	0	33.3	66.7
BU 5	9.1	9.1	81.8

Table 3: overview outcomes knowledge creation per BU

Table 3 shows that a majority of respondents in BU 1 (72.9%), BU 3 (58.3%), BU 4 (66.7%) and BU 5 (81.8%) agree that knowledge creation occurs, thus showing that knowledge is created by transforming tacit or explicit knowledge to new content or by replacing existing knowledge. However, 50 percent of respondents of BU 2 agree, whereas the other 50 percent neither agree nor disagree that knowledge creation occurs. This shows that it is not clear whether or not knowledge creation fully occurs in BU 2.

The level of knowledge caption in organization X is measured with seven items. The mean score of these items is 4.306, on a scale from 1 (strongly disagree) to 7 (strongly agree), thus indicating that respondents neither agree nor disagree that knowledge caption occurs. However, most respondents (47.8%) agree that knowledge caption occurs. It shows that knowledge is actively embodied in documentation, databases, organizational procedures and processes. However, 22.3 percent of the respondents disagree, and 29.9 percent of the respondents neither agree nor disagree that knowledge caption occurs. Table 4 provides an overview of the mean scores of the perceived level of knowledge caption per BU, which emphasizes some differences between the BU's.

Knowledge caption			
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
BU 1	18.1	36.4	45.5
BU 2	50	25	25
BU 3	33.3	16.7	50
BU 4	33.3	33.3	33.3
BU 5	13.6	27.3	59.1

Table 4: Overview outcomes knowledge caption per BU

Table 4 shows that most respondents of the BU 1 (45.5%), BU 3 (50%) and BU 5 (59.1%) agree that knowledge is actively embodied in documentation, databases, organizational procedures and processes. However, most respondents in BU 2 (50%) indicate that knowledge caption does not occur, whereas the outcomes in BU 4 are equally distributed. 33.3 percent of the respondents in BU 4 do not agree, 33.3 percent do agree and 33.3 percent of the respondents neither agree nor disagree that knowledge caption occurs, showing that knowledge is not actively embodied in BU 4. The different outcomes per BU may also explain the mean value of 4.306, because it differs per BU whether or not respondents indicate if knowledge caption occurs, which may keep the mean more in the middle.

The perceived level of knowledge dissemination depends on the constructs core knowledge sharing and knowledge sharing. The mean score is 5.294, on a scale from 1 (strongly disagree) to 7 (strongly agree), thus indicating that respondents agree that knowledge dissemination occurs. Indeed, 86.6 percent of the respondents agree that knowledge dissemination occurs. This result shows that most respondents

indicate that knowledge is exchanged and processed from one employee or unit to another. The other 13.4 percent of the respondents neither agree nor disagree. Table 5 provides an overview of the mean scores of the perceived level of knowledge dissemination per BU, which shows that results are more or less comparable.

Knowledge dissemination			
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
BU 1	0	13.6	86.4
BU 2	0	25	75
BU 3	0	33.3	66.7
BU 4	0	0	100
BU 5	0	4.5	95.5

Table 5: overview outcomes knowledge dissemination per BU

Table 5 shows that a majority of respondents of BU 1 (86.4%), BU 2 (75%), BU 3 (66.7%), BU 4 (100%) and BU 5 (95.5%) agree that knowledge dissemination occurs, thus indicating that individuals in their BU actively share knowledge with other employees.

The final aspect of KM is knowledge application. Overall, 61.2 percent of the respondents agree that knowledge application occurs, thus indicating that knowledge is actively applied in daily work processes. 25.4 percent of the respondents neither agree nor disagree and the final 13.4 percent disagree that knowledge application occurs. As mentioned before, in order to effectively apply knowledge, there should be knowledge application processes in place. However, still 37.9 percent of respondents perceive that there are no knowledge application processes. Table 6 provides an overview of the mean scores of the perceived level of knowledge application per BU.

Knowledge application			
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
BU 1	27.3	22.7	50
BU 2	25	75	0
BU 3	0	33.3	66.7
BU 4	0	16.7	83.3
BU 5	9.1	18.2	72.7

Table 6: overview outcomes knowledge application per BU

Table 6 shows that most respondents in BU 1 (50%), BU 3 (66.7%), BU 4 (83.3%) and BU 5 (72.7%) agree that knowledge is actively applied in daily work processes. Whereas 75 percent of respondents in BU 2 neither agree nor disagree that knowledge application occurs in their BU and 25 percent disagrees.

The variables knowledge creation, knowledge caption, knowledge dissemination and knowledge application comprise the dependent variable KM. The mean score of the dependent variable is 4.967 which is very close to five on the scale from 1 (strongly disagree) to 7 (strongly agree), which indicates that respondents agree that KM occurs. Indeed, 74.6 percent of the respondents agree that knowledge management occurs. It shows that respondents agree that knowledge is actively created, captured, disseminated and applied. 23.9 percent neither agree nor disagree and the final 1.5 percent disagrees. Table 7 provides an overview of the mean scores of the perceived level of knowledge management per BU.

Knowledge management			
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
BU 1	0	22.7	77.3
BU 2	0	50	50
BU 3	8.3	25	66.7
BU 4	0	33.3	66.7
BU 5	0	18.2	81.8

Table 7: Overview outcomes dependent variable knowledge management

Table 7 shows that a majority of the respondents in BU 1 (77.3%), BU 3 (66.7%), BU 4 (66.7%) and BU 5 (81.8%) agree that knowledge is actively created, captured, disseminated and applied. Whereas 50 percent of respondents in BU 2 neither agree nor disagree and 50 percent of the respondents agree. Moreover, when analysing the results per function level and educational level, the majority of all categories agree that KM occurs.

Independent variables

ORGANIZATIONAL CULTURE

An organizational culture that enhances KM is a culture of trust and social networks. The descriptives of the concept culture and its variables are provided in table 8.

	Mean	Median	Mode	STD	Variance	Min	Max
Organizational culture	5.984	6	6*	.760	.577	3.50	7
Culture of trust	6.08	6.111	6	.794	.630	3.22	7
Culture of social networks	5.704	6	6	.994	.987	2	7
*** Scale ranging from 1 (strongly disagree) to 7 (strongly agree)**							

Table 8: descriptives organizational culture

A culture of cognitive and affective based trust comprises a culture of trust. The averages of outcomes of a culture of trust varied from 3.22 to 7 in a possible range of scores from 1 (strongly disagree) to 7 (strongly agree). The mean score is 6.08, indicating that respondents agree that there is a culture of trust. Indeed, 94 percent of the respondents indicate that there is a culture of trust. It means that respondents have trust in the skills, knowledge and abilities of their colleagues and can share their feelings and problems with colleagues. Only 1.5 percent does not agree, and the other 4.5 percent neither agree nor disagree that there is a culture of trust. Table 9 shows the distribution of the mean scores of the perceived level of a culture of trust and social networks per BU. A clear majority of respondents in BU 1 (90.9%), BU 2 (100%), BU 3 (91.7%), BU 4 (100%) and BU 5 (95.5%) agree that they trust the skills, knowledge and abilities of their colleagues and can share their feelings and problems with colleagues. When analysing these results per educational level, function level and age, there are no remarkable differences. The majority of each category agrees that there is a culture of trust.

	Culture of trust							Culture of social networks						
	Disagree			Na/Nd	Agree			Disagree			Na/Nd	Agree		
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
BU 1		0		9.1		90.9			9.1		9.1		81.8	
BU 2		0		0		100			0		0		100	
BU 3		8.3		0		91.7			0		16.7		83.3	
BU 4		0		0		100			0		0		100	
BU 5		0		4.5		95.5			4.5		4.5		91	

Table 9: Overview outcomes constructs organizational culture per BU

The second construct that enhances KM is a culture of social networks. The mean score is 5.704, in a possible range from 1 (strongly disagree) to 7 (strongly agree). This mean score indicates that respondents agree that there is a culture of social networks. Indeed, 88 percent of the respondents agree that there is a culture of social networks, whereas only 4.5 percent does not agree and the final 7.5 percent neither agree nor disagree. In table 9, the results are provided per BU. A majority of respondents in BU 1 (81.8%), BU 2 (100%), BU 3 (83.3%), BU 4 (100%) and BU 5 (91%) agree that there is a culture of social networks. Finally, when analysing these results per educational level and per age category, the majority of the respondents agree that there are social networks in their BU's.

These constructs together comprise the variable "culture". The mean is 5.984, which indicates that the average responses of respondents indicate that there is an organizational culture that enhances KM. Indeed, 92.5 percent of the respondents indicate that there is an organizational culture of organizational trust and social networks. The other 7.5 percent neither agree nor disagree. In table 10, the mean scores of the perceived level of organizational culture are provided per BU.

	Organizational culture						
	Disagree			Na/Nd	Agree		
	1	2	3	4	5	6	7
BU 1		0		9.1		90.9	
BU 2		0		0		100	
BU 3		0		8.3		91.7	
BU 4		0		0		100	
BU 5		0		9.1		90.9	

Table 10: Overview outcomes organizational culture per BU

Table 10 shows that a majority of respondents in BU 1 (90.0%), BU 2 (100%), BU 3 (91.7%), BU 4 (100%) and BU 5 (90.9%) agree that there is an organizational culture of trust and social networks. When analysing the results per educational level and function level, a clear majority agrees that there is an organizational culture that enhances KM.

ORGANIZATIONAL STRUCTURE

In this research the variables formalization and centralization define the organizational structure. The level of formalization is measured by two constructs; the level of job codification and the level of rule observation. An organization is considered formalized when there is a high level of job codification and rule observation.

	Mean	Median	Mode	STD	Variance	Min	Max
There is a formal organizational structure	4.327	4.429	4.43	1.039	1.079	1	6.71
There is a high level of job codification	4.835	5	6	1.265	1.599	1	7
There is a high level of rule observation	3.659	3.667	2.67	1.084	1.175	1	6.33
*** Scale ranging from 1 (strongly disagree) to 7 (strongly agree)**							

Table 11: descriptives level of formalization

The first construct is the level of job codification. Overall, a majority of 70 percent of the respondents agree that there is a high level of job codification, indicating a formalized organizational structure. It means that there are many rules, guidelines and operational procedures, which defines the daily work. 16.5 percent of the respondents neither agree nor disagree and 13.5 percent of the respondents disagree that there is a high level of job codification.

	High level of job codification							High level of rule observation						
	Disagree			Na/Nd	Agree			Disagree			Na/Nd	Agree		
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
BU 1		27.3		22.7		50			66.7		14.3		19	
BU 2		25		25		50			100		0		0	
BU 3		0		0		100			25		50		25	
BU 4		0		33.3		66.7			50		50		0	
BU 5		9.1		13.6		77.3			13.6		45.5		40.9	

Table 12: overview outcomes constructs level of formalization per BU

Table 12 shows the results per business unit. Most respondents in all BU's agree that there is a high level of job codification, indicating that there are rules, guidelines and processes which define the daily work. The outcomes are especially high in BU 3 (100%), BU 4 (66.7%) and BU 5 (77.3%), indicating a high level of job codification.

The second construct that defines the level of formalization is the level of rule observation. Overall, most respondents (42.4%) disagree that there is a high level of rule observation, 33.3 percent neither agree nor disagree and 24.3 percent of the respondents agree that there is a high level of rule observation. Thus, most respondents indicate that there is a low level of rule observation, which means that the organization does not really monitor and control the rule compliance. There is one missing response, which is a percentage of 1.5 percent of the total respondents (67). 1.5 percent of the respondents is indicating that they do not know if there is a high level of rule observation. When taking this missing response into account, 41.8 percent of the respondents disagreed that there is a high level of rule observation, 32.8 percent neither agree nor disagree, 23.9 percent of the respondents agree and the final 1.5 percent do not know. Regardless if the missing response is taken into account, most respondents indicate that there is a low level of rule observation. In table 12**,** the results are provided per business unit. Most respondents of BU 1 (66.7%) and BU 2 (100%) disagree that there is a high level of rule observation, indicating an informal organizational structure. Most respondents of BU 3 and BU 5 indicate that they neither agree nor disagree that there is a high level of rule observation. However, still 40.9 percent of respondents of BU 5 and 25 percent of respondents of BU 3 agree that there is a high level of rule observation, indicating a more formalized organizational structure. Finally, 50 percent of respondents of BU 4 disagree that there is a high level of rule observation and the other 50 percent neither agree nor disagree.

These two constructs together comprise the variable formalization. Overall, the averages of outcomes of a formalized organizational structure varied from 1 to 6.71. The mean score is 4.327, in a possible range from 1 (strongly disagree) to 7 (strongly agree), indicating that respondents neither agree nor disagree that there is a formalized organizational structure. Indeed, most respondents (41.8%) neither agree nor disagree that there is a formalized organizational structure. Still, 40.3 percent of the respondents agree that there is a formal organizational structure and 17.9 percent of the respondents disagree that there is a formal organizational structure. These outcomes show that it is not clear whether there is a formal or informal organizational structure. In table 13, the mean scores of the perceived level of formalization are provided per business unit.

There is a formalized organizational structure

	Disagree	**Na/Nd**	**Agree**
	1 2 3	**4**	**5 6 7**
BU 1	31.8	50	18.2
BU 2	75	25	0
BU 3	0	50	50
BU 4	0	83.3	16.7
BU 5	9.1	18.2	72.7

Table 13: overview outcomes level of formalization per BU

Table 13 shows that most respondents (50%) in BU 1 neither agree nor disagree that there is a formalized organizational structure and 31.8 percent of the respondents disagree. A majority of respondents in BU 2 (75%) disagree that there is a formalized organizational structure. 50 percent of respondents of BU 3 also indicate that there is a formalized organizational structure, however, also 50 percent neither agree nor disagree with this statement. A majority of respondents in BU 4 (83.3%) neither agree nor disagree that there is a formalized organizational structure. Finally, a majority of respondents in BU 5 (72.7%) indicate that there is a formal organizational structure. When analysing the results per function level, a majority of the function categories “MT” (60%), “sector managers” (50%) and “team assistants” (66.7%) agree that there is a formalized organizational structure. Whereas, 39 percent of the function category “managers” neither agree nor disagree, and also 39 percent agrees. Most respondents in the category “other functions” (58.4%) neither agree nor disagree with the statement, whereas 24.9 percent agrees. When analysing the results per educational level, most respondents of the categories “secondary vocational education” (100%), “higher general education” (66.6%) and “university degree” (42.9%) neither agree nor disagree that there is a formalized organizational structure. Whereas most respondents of the categories “higher professional education” (44.6%) and “PhD” (66.6%) agree that there is a formalized organizational structure.

The second variable of organizational structure is centralization. The level of centralization is defined by two constructs: participation in decision making and the degree of hierarchy and authority. An organization is considered centralized when there is a low level of participation in decision making and a high degree of hierarchy and authority.

	Mean	Median	Mode	STD	Variance	Min	Max
There is a centralized organizational structure	3.508	3.40	3a*	1.173	1.377	1.10	6.80
There is a low level of participation in decision making	3.864	4	1a*	1.538	2.365	1	7
There is a high level of hierarchy and authority	2.744	2	2	1.366	1.867	1	6.50
*** Scale ranging from 1 (strongly disagree) to 7 (strongly agree)**							

Table 14: descriptives level of centralization

The first construct is participation in decision making. The averages of outcomes of participation in decision making varied from 1 to 7 in a possible range of scores from 1 (strongly disagree) to 7 (strongly agree). The mean score is 3.864, indicating that respondents disagree that they do not participate in decision making. Overall, 37.3 percent of the respondents agree that they do not participate in decision making. However, 35.8 percent of the respondents indicate that they do participate in decision making. 26.9 percent of the respondents neither agree nor disagree. In table 15, the results are provided per business unit.

	No participation in decision making				High degree of hierarchy of authority		
	Disagree	Na/Nd	Agree		Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7		1 2 3	4	5 6 7
BU 1	36.4	27.2	36.4		86.4	9.1	4.5
BU 2	0	50	50		100	0	0
BU 3	33.3	25	41.7		58.3	25	16.7
BU 4	50	16.7	33.3		100	0	0
BU 5	36.4	27.2	36.4		63.6	9.1	27.3

Table 15: overview outcomes constructs level of centralization per BU

Table 15 shows very differentiated results. 36.4 percent of respondents of BU 1 and BU 5 disagree that they do not participate in decision making, whereas also 36.4 percent agree that they do not participate in decision making. The final 27.2 percent of respondents in BU 1 and BU 5 neither agree nor disagree. 50 percent of respondents of BU 2 agree that they do not participate and the other 50 percent neither agree nor disagree. Most respondents in BU 3 (41.7%) indicate that they do not participate in decision making, whereas still 33.3 percent of the respondents indicate that they do participate in decision making. Finally, most respondents in BU 4 (50%) disagree that they do not participate in decision making, indicating a more decentralized organizational structure. Still 33.3 percent of the respondents in BU 4 agree that they do not participate in decision making. The analyses per function level may explain some of the differentiated outcomes per BU. 100 percent of the MT and sector managers disagree that they do not participate in decision making. Whereas most respondents of the categories “managers” (39%), “team assistants” (66.7%) and “other functions” (58.3%) agree that they do not participate in decision making. These results show that the higher the function level, the more people participate in decision making. This may explain some of the differentiated outcomes per BU, because the BU managers, sector managers and some respondents of the category “managers” disagree that they do not participate and the other respondents of the category “managers”, and team assistants and other functions agree that they do not participate.

The second construct of centralization is the degree of hierarchy and authority. Overall, a majority of respondents (76.2 percent) disagree that there is a high level of hierarchy and authority, indicating a decentralized organizational structure. 13.4 percent of the respondent agree that there is a high level of hierarchy and authority and the final 10.4 percent neither agree nor disagree. In table 15, the results are provided per business unit. A majority of respondents in BU 1 (86.4%), BU 2 (100%), BU 3 (58.3), BU 4 (100 %) and BU 5 (63.6%) indicate that they disagree that there is a high level of hierarchy and authority, indicating a decentralized organizational structure.

These two constructs together measure the level of centralization in organization X. Overall, the averages of outcomes of a centralized organizational structure varied from 1.10 to 6.80. The mean score is 3.508 indicating that respondents disagree that there is a centralized organizational structure. Indeed, most respondents (50.7%) disagree that there is a centralized organizational structure, thus indicating a decentralized organizational structure. 20.9 percent of the respondents agree that there is a centralized structure and the other 28.4 percent of the respondents neither agree nor disagree. In table 16, the results are provided per business unit.

There is a centralized organizational structure

	Disagree		**Na/Nd**	**Agree**	
	1	**2** **3**	**4**	**5** **6**	**7**
BU 1	54.5		27.3	18.2	
BU 2	50		50	0	
BU 3	33.3		33.3	33.3	
BU 4	50		50	0	
BU 5	54.5		18.2	27.3	

Table 16: overview outcomes level of centralization per BU

The results in table 16 show that most respondents in BU 1 (54.5%) and BU 5 (54.5%) disagree that there is a centralized organizational structure, thus indicating a decentralized structure. However, still 27.3 percent of the respondents in BU 5 and 18.2 percent of respondents in BU 1 agree that there is a centralized structure. 50 percent of respondents of BU 2 and BU 4 disagree that there is a centralized organizational structure and also 50 percent neither agree nor disagree in BU 2 and BU 4. Finally, the results from respondents in BU 3 are differentiated. 33.3 percent disagree, 33.3 percent neither agree nor disagree and the final 33.3 percent agree. When analysing the results per function level, most respondents of the function categories “MT” (100%), “sector managers” (83.3%) and “managers (48.8%) disagree that there is a centralized organizational structure. However, still 29.3 percent of the respondents of the function category “managers” neither agree nor disagree. The majority of the category “team assistants” (66.7%) neither agree nor disagree that there is a centralized organizational structure. Finally, the outcomes of the function category “other functions” are equally distributed. 33.3 percent disagree, 33.3 percent neither agree nor disagree and the final 33.3 percent agree. When analysing the results per educational level, the majority of respondents of the categories “secondary vocational education” (100%) and “higher general education” (66.7%) neither agree nor disagree that there is a centralized organizational structure. Most respondents of the categories “higher professional education” (55.6%), “university degree” (50%) and “PhD” (100%) disagree that there is a centralized organizational structure.

STRATEGY

The concept strategy consists of three variables: mission, vision and strategy. Table 17 shows the descriptives of these variables.

	Mean	Median	Mode	STD	Variance	Min	Max
Mean strategy	4.471	4.90	6	1.306	1.706	2	7
There is a KM mission	4.896	5	6	1.403	1.968	2	7
There is a KM vision	4.680	5	5	1.377	1.896	2	7
There is a KM strategy	4.313	5	6	1.613	2.602	2	7
*** Scale ranging from 1 (strongly disagree) to 7 (strongly agree)**							

Table 17: descriptives KM strategy

The mean values of the three items shows that respondents neither agree nor disagree that there is a KM mission, vision or strategy in the organization. However, important to note is that there are many missing values ("do not know") in these separate items. 19 respondents indicated that they "do not know" whether there is a KM mission. 17 respondents indicated that they "do not know" whether there is a KM vision. Again, 19 respondents indicated that they do not know if there is a KM strategy. These items together comprise the concept "strategy", which lead to an average outcome of 13 missing values (people whose mean score indicated that they do not know if there is an organizational strategy). Overall, 55.6 percent of the respondents agree that there is a KM strategy. 29.6 percent of the respondents disagree, whereas, 14.8 percent of the respondents neither agree nor disagree. However, there are 13 missing responses, which is a percentage of 19.4 percent of the total respondents. When taking these missing responses into account, 23.9 percent of the respondents disagreed, 11.9 percent of the respondents neither agreed nor disagreed, 44.8 percent of the respondents agreed and 19.4 percent of the respondents do not know whether there is an KM strategy or not. Still, most respondents indicate that they agree that there is an organizational strategy, however, this outcome is 10.8 percent points lower once the missing responses are taking into account. Table 18 shows the results per business unit.

	There is a KM strategy						
	Disagree			**Na/Nd**	**Agree**		
	1	**2**	**3**	**4**	**5**	**6**	**7**
BU 1		47.1		29.4		23.5	
BU 2		50		0		50	
BU 3		25		12.5		62.5	
BU 4		0		0		100	
BU 5		22.2		11.1		66.7	

Table 18: overview outcomes KM strategy per BU

Table 18 shows that most respondents in BU 1 (47.1%) disagree that there is a KM strategy in place. Whereas, most respondents in BU 3 (62.5), BU 4 (100%) and BU 5 (66.7%) agree that there is a KM strategy in place. Finally, 50 percent of the respondents in BU 2 disagree and also 50 percent agree that there is a KM strategy. Still, it is important to note that there are 13 missing responses who indicate that they do not know whether there is a KM strategy or not, which is important to take into account.

REWARDS

Rewards can be distinguished in extrinsic and intrinsic rewards. These constructs together measure the level of rewards in an organization.

	Mean	Median	Mode	STD	Variance	Min	Max
In our business unit, there are rewards in place for KM	5.204	5.333	5	.787	.619	2.67	6.42
In our business unit, there are extrinsic rewards in place for KM	4.799	5	5a*	1.163	1.352	1	6.80
In our business unit, there are intrinsic rewards in place for KM	5.449	5.571	5.71a*	.768	.589	3.14	6.86
*** Scale ranging from 1 (strongly disagree) to 7 (strongly agree)**							

Table 19: descriptives rewards and incentives

Extrinsic rewards consist of the constructs expected organizational rewards and reciprocal benefits. 76.2 percent of the respondents indicate that there are no organizational rewards for KM, which may range from monetary rewards, like bonuses, higher salary et cetera, to non-monetary rewards, such as promotions and job security. A majority of respondents (82.8%) does agree that there are reciprocal benefits in place, which means that the perceived extrinsic benefits are higher than the effort. Together, these variables comprise the construct “extrinsic rewards”. The mean score is 4.799, on a scale ranging from 1 (strongly disagree) to 7 (strongly agree), indicating that respondents neither agree nor disagree that extrinsic rewards are in place. However, 70.8 percent of the respondents agree that there are extrinsic rewards in place for KM. 18.4 percent of the respondents neither agree nor disagree and the final 10.8 percent disagrees that there are extrinsic rewards in place. However, there are two missing responses, which is 3 percent of the total respondents (67), whose mean score indicates that they do not know if there are extrinsic rewards in place. When taking these missing responses into account, 10.4 percent disagreed, 17.9 percent neither agreed nor disagreed, 68.7 percent agreed and the final 3 percent do not know. Still, most respondents indicated that they agree that extrinsic rewards are in place. In table 20, the mean scores of the perceived level of extrinsic rewards are analysed per business unit.

	There are extrinsic rewards in place for KM		
	Disagree	**Na/Nd**	**Agree**
	1 2 3	**4**	**5 6 7**
BU 1	19	14.3	66.7
BU 2	0	33.3	66.7
BU 3	8.3	25	66.7
BU 4	0	16.7	83.3
BU 5	9.1	18.2	72.7

Table 20: Overview outcomes extrinsic rewards per BU

The results in table 20 show that a majority of respondents in BU 1 (66.7%), BU 2 (66.7%), BU 3 (66.7%), BU 4 (83.3%) and BU 5 (72.7%) agree that there are extrinsic rewards in place for KM. Still, important to note is that there are two missing responses whose average score shows that they do not know whether there are extrinsic rewards or not. Finally, it is important to take into account that these extrinsic rewards do not include expected organizational rewards, such as bonuses, higher salary, promotion, et cetera.

The second construct of the variable rewards is “intrinsic rewards”. The level of self-efficacy and enjoyment in helping others determine whether or not there are intrinsic rewards. The mean value is 5.449, indicating that respondents agree that there are intrinsic rewards in place for KM. 91 percent of the respondents agree that there are intrinsic rewards in place for KM. This shows that respondents indicate that KM will benefit themselves in terms of satisfaction derived from the experience and because of the enjoyment of helping others. Only 1.5 percent of the respondents disagree and the final 7.5 percent neither agree nor disagree. In table 21, the results are analysed per business unit.

There are intrinsic rewards in place for KM

	Disagree			Na/Nd	Agree		
	1	2	3	4	5	6	7
BU 1		4.5		13.5		82	
BU 2		0		0		100	
BU 3		0		8.3		91.7	
BU 4		0		0		100	
BU 5		0		4.5		95.5	

Table 21: Overview outcomes intrinsic rewards per BU

Table 21 shows that a clear majority of respondents in BU 1 (82%), BU 2 (100%), BU 3 (91.7%), BU 4 (100%) and BU 5 (95.5%) agree that there are intrinsic rewards in place for KM.

These two constructs comprise the variable “rewards”. The mean score of this variable is 5.204, indicating that respondents agree that there are rewards in place for KM. Indeed, 86.5 percent of the respondents agree that there are rewards in place for KM. 4.5 percent disagree and 9 percent neither agree nor disagree. In table 22, the results are analysed per BU.

There are rewards in place for KM

	Disagree			Na/Nd	Agree		
	1	2	3	4	5	6	7
BU 1		9.1		9.1		81.8	
BU 2		0		0		100	
BU 3		8.3		8.3		83.4	
BU 4		0		0		100	
BU 5		0		13.6		86.4	

Table 22: overview outcomes rewards per BU

Table 22 shows that a majority of respondents in BU 1 (81.8%), BU 2 (100%), BU 3 (83.4%), BU 4 (100%) and BU 5 (86.4%) agree that there are rewards (intrinsic and extrinsic rewards) in place for KM. Important to note is that the extrinsic rewards do not include expected organizational rewards, such as bonuses, higher salary, promotion et cetera. 76.2 percent of the respondents have indicated that these rewards are not in place. When analysing the results per function level, educational level and age, the majority of all categories agree that there are rewards in place for KM.

TRAINING

Training is an important enabler of sub-variables of KM. First, respondents were asked to indicate whether or not they were fully supported in their daily work to apply KM. Overall, 60.6 percent of the respondents indicate that they have enough time and support to apply KM in their daily activities and projects. 22.7 percent of the respondents neither agree nor disagree and 16.7 percent disagree with the

statement. However, there is one missing response, which is a percentage of 1.5 percent of the total respondents (67), whose mean score indicates that they do not know if they have enough time and support to apply KM. When taking these missing responses into account, 16.4 percent disagrees, 22.4 percent neither agree nor disagree, 59.7 percent agrees. Still, most respondents indicate that they do have enough time and support to apply KM. In table 23, the results are analysed per BU.

	I have enough time and support to apply KM		
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
BU 1	18.2	18.2	63.6
BU 2	50	50	0
BU 3	16.7	25	58.3
BU 4	0	40	60
BU 5	13.6	18.2	68.2

Table 23: overview outcomes time and support per BU

The results in table 23 show that a majority of respondents in BU 1 (63.6%), BU 3 (58.3%), BU 4 (60%) and BU 5 (68.2%) indicate that they have enough time and support to apply KM in their daily work. Whereas, 50 percent of the respondents in BU 2 indicate that they disagree with the statement, thus implying to not have enough time and support to apply KM. The other 50 percent of respondents in BU 2 neither agree nor disagree.

Moreover, this research also examines whether or not there were KM trainings in place. Overall, 13 of the 67 respondents indicated that there was a KM training in place, whereas 41 respondents indicated that there were no KM trainings in place. Overall, 87.9 percent of the respondents indicate that a training for KM will be very useful. The majority of respondents (90%) indicate that a future training should focus on how to convert personal expertise into transferable knowledge. 82.9 percent of the respondents agree that a future training should focus on where employees could find information. 90 percent of the respondents agree that a KM training should focus on where answers can be found regarding problems with creating, storing, dissemination and the application of knowledge. Finally, 82.5 percent of the respondents agree that a future KM training should focus on the advantages of KM.

LEADERSHIP

KM leadership consists of three dimensions: leadership skills, cooperation and knowledge integration. First, managers should acquire the right leadership skills, which means understanding the meanings and implications of KM and take an exemplary role, which will help motivate employees to apply KM.

	Mean	Median	Mode	STD	Variance	Min	Max
Leadership	4.747	5	6	1.161	1.349	1.55	6.64
Leadership qualities	4.615	4.875	6	1.402	1.965	1	7
Creating and supporting cooperation	4.964	5.30	6	1.185	1.404	1.60	6.80
Stimulating knowledge integration	4.492	4.50	4a*	1.460	2.131	1	7
*** Scale ranging from 1 (strongly disagree) to 7 (strongly agree)**							

Table 24: descriptives leadership

The mean of “leadership qualities” is 4.615, on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). Overall, 54.7 percent of the respondents agree that the MT acquires the right leadership qualities.

26.6 percent of the respondents neither agree nor disagree and 18.7 percent of the respondents disagree. However, there are three missing responses, which is a percentage of 4.5 of the total respondents (67). The missing respondents indicated that they do not know if the MT has the right leadership skills. When taking these missing responses into account, 17.9 percent disagreed, 25.4 percent neither agreed nor disagreed and 52.2 percent agreed. Still, most respondents indicate that they agree that the MT acquire the right leadership skills. In table 25, the results are analysed per BU, including the differences between MT and other employees.

The MT has the right knowledge leadership qualities

	Disagree			Na/Nd	Agree		
	1	2	3	4	5	6	7
MT			0	0		100	
BU 1			35	25		40	
BU 2			50	0		50	
BU 3			10	40		50	
BU 4			0	80		20	
BU 5			10	20		70	

Table 25: overview outcomes knowledge leadership skills per BU

The results in table 25 show that there are differences between the MT and employees in the BU's about whether or not the MT acquires the right leadership qualities. All MT members agree that they acquire the right knowledge leadership qualities. Moreover, also most respondents of BU 1 (40%) agree that the MT has the right knowledge leadership qualities, whereas still 35 percent disagree and 25 percent neither agree nor disagree. 50 percent of the respondents in BU 2 also agree that the MT acquires the right knowledge leadership qualities, but also 50 percent disagree. Furthermore, most respondents of BU 3 (50%) and BU 5 (70%) agree that the MT acquires the right knowledge leadership qualities. Whereas the majority of respondents in BU 4 (80%) neither agree nor disagree with the statement.

Second, managers should be able to create an environment of cooperation, which will enhance and stimulate KM between employees. The mean score is 4.964, on a scale from 1 (strongly disagree) to 7 (strongly agree), which indicates that respondents agree that the MT creates and supports cooperation between employees. Overall, 71.2 percent of the respondents agree that the MT creates and supports cooperation between employees. 18.2 percent of the respondents neither agree nor disagree and 10.6 percent of the respondents disagree with the statement. However, there is one missing response, which is a percentage of 1.5 percent of the total respondents (67). The missing respondent indicated that they do not know if the MT creates and supports cooperation between employees. When taking the missing response into account, still 10.5 percent disagree, 17.9 percent neither agree nor disagree and 70.1 percent agrees. Still, most respondents indicate that they agree that the MT creates and supports cooperation between employees. In table 26, the results are analysed per BU, including the differences between MT and other employees.

The MT creates and supports cooperation between employees			
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
MT	0	0	100
BU 1	10	25	65
BU 2	25	50	25
BU 3	18.2	18.2	63.6
BU 4	0	0	100
BU 5	9.5	14.3	76.2

Table 26: overview outcomes knowledge creating and support cooperation per BU

Results in table 26 show that the responses of the MT correspond with responses in BU 1, BU 3, BU 4 and BU 5. Here, a large majority agree that the MT create and support cooperation between employees. However, most respondents in BU 2 (50%) neither agree nor disagree that the MT creates and supports cooperation between employees.

The final aspect of "knowledge leadership" is knowledge integration, in which members of MT should stimulate employees to actively apply KM and to stimulate their learning ability. The mean score of this construct is 4.492, on a scale ranging from 1 (strongly disagree) to 7 (strongly agree) which indicates that respondents neither agree nor disagree that the MT stimulate individuals' learning and innovative ability. However, 60.9 percent of the respondents agree that the MT stimulates knowledge integration. 18.8 percent of the respondents disagree with the statement, 20.3 percent of the respondents neither agree nor disagree. However, there are three missing response, which is a percentage of 4.5 percent of the total respondents (67). The missing respondent indicated that they do not know if the MT supports knowledge integration between employees. When taking the missing response into account, 18 percent disagree, 19.4 percent neither agree nor disagree and 58.1 percent agrees. Still, most respondents indicate that they agree that the MT creates and supports cooperation between employees. In table 27, the results are analysed per BU, including the differences between MT and other employees.

The MT stimulates knowledge integration			
	Disagree	Na/Nd	Agree
	1 2 3	4	5 6 7
MT	0	20	80
BU 1	20	25	55
BU 2	33.3	33.3	33.3
BU 3	30	20	50
BU 4	40	40	20
BU 5	9.5	9.5	81

Table 27: overview outcomes stimulating knowledge integration per BU

Table 27 shows that 80 percent of the members of MT agree that they stimulate knowledge integration. This is also supported by most respondents in BU 1 (55%), BU 3 (50%) and BU 5 (81%). However, the responses of BU 2 are equally divided. 33.3 percent disagree, 33.3 percent neither agree nor disagree and 33.3 percent agree. Finally, 40 percent of respondents in BU 4 disagree and 40 percent of the respondents neither agree nor disagree that the MT stimulates knowledge integration, whereas 20 percent of respondents agree.

These three constructs together comprise the variable leadership. The mean score of this variable is 4.747, on a scale ranging from 1 (strongly disagree) to 7 (strongly agree), indicating that respondents neither agree nor disagree that the MT acquires the right KM leadership style. 59.1 percent of the respondents indicate that they agree that the MT acquires the right KM leadership style (skills, supporting and integration), 28.8 percent neither agree nor disagree and 12.1 percent of the respondents disagree. However, there is one missing response, which is a percentage of 1.5 percent of the total respondents (67). The missing respondent indicated that they do not know if the MT acquires the right KM leadership style. When taking the missing response into account, still 11.9 percent disagree, 28.4 percent neither agree nor disagree and 58 percent agrees. Still, most respondents indicate that they agree that the MT acquires the right KM leadership style. In table 28, the results are analysed per BU, including the differences between MT and other employees.

The MT acquires the right knowledge management leadership style

	Disagree 1 2 3	Na/Nd 4	Agree 5 6 7
MT	0	0	100
BU 1	20	40	40
BU 2	25	50	25
BU 3	18.2	18.2	63.6
BU 4	0	40	60
BU 5	4.8	23.8	71.4

Table 28: overview outcomes knowledge management leadership style per BU

The results in table 28 show that all MT members agree that they acquire the right knowledge management leadership style. This is supported by a majority of respondents in BU 3 (63.6%), BU 4 (60%) and BU 5 (71.4%). Whereas most respondents in BU 2 (50%) neither agree nor disagree with the statement. 40 percent of respondents of BU 1 agree with the statement, whereas also 40 percent neither agree nor disagree, the final 20 percent disagrees.

This table show that there are some differences between the responses from the MT and other employees, even though they are sometimes small. Therefore, a single item analysis was performed in order to find real differences. The “do not know” category is now included in this analysis, because it is a single item analysis, and therefore the “do not know” category will not influence the mean or distribution scores.

There are differences in results between MT and employees in the item “The MT applies KM” (table 29).

	The MT applies KM				The MT applies KM as an example for others			
	Do not know 0	Disagree 1 2 3	Na/Nd 4	Agree 5 6 7	Do not know 0	Disagree 1 2 3	Na/Nd 4	Agree 5 6 7
MT	0	0	0	100	0	0	20	80
BU 1	23.8	33.3	9.5	33.4	14.3	47.6	4.8	33.3
BU 2	50	50	0	0	50	50	0	0
BU 3	18.2	9.1	9.1	63.6	18.2	27.3	9.1	45.4
BU 4	20	60	0	20	0	60	40	0
BU 5	14.3	19	4.8	61.9	19	19	9.5	52.5

Table 29: Overview results items "The MT applies KM" and “The MT applies KM as an example for others”

Results in table 29 show that all MT members agree that they apply KM, whereas only a majority of the respondents of BU 3 (63.6%) and BU 5 (61.9%) agree that the MT applies KM. Respondents of BU 1 and BU 2 show differentiated results. 33.3 percent of respondents in the BU disagree that the MT applies KM, whereas also 33.3 percent of respondents agree that the MT applies km. 50 percent of respondents of BU 2 do not know if the MT applies KM and the other 50 percent disagrees. Finally, a majority of respondents in BU 4 disagree that the MT applies KM.

Table 29 also shows that there are differences between the MT and other employees regarding the item "the MT applies KM as an example for others". Again, most members of the MT agree that they apply KM as an example for others. Only most respondents of BU 3 (45.4%) and BU 5 (52.5%) agree with this statement. However, most respondents of BU 1 (47.6%) and BU 4 (60%) disagree that the MT applies KM as example for others. Finally, 50 percent of the respondents of the BU 2 do not know, whereas the other 50 percent disagree. These outcomes show the differentiation between the responses of MT and employees.

	The MT has excellent KM leadership skills				**The MT provides the necessary resources for KM**			
	Do not know 0	**Disagree 1 2 3**	**Na/Nd 4**	**Agree 5 6 7**	**Do not know 0**	**Disagree 1 2 3**	**Na/Nd 4**	**Agree 5 6 7**
MT	0	0	20	80	0	0	0	100
BU 1	14.3	57.1	9.5	19.1	9.5	42.8	9.5	38.2
BU 2	25	75	0	0	25	50	0	25
BU 3	27.3	27.3	27.3	18.1	18.2	27.3	27.3	27.2
BU 4	20	20	20	40	20	0	0	80
BU 5	23.8	14.3	14.8	57.1	0	14.3	19.5	76.2

Table 30: Overview results items "The MT has excellent KM leadership skills" and "The MT provides the necessary resources for KM"

Table 30 shows that a majority of the MT agrees that they have excellent leadership skills and that they provide the necessary resources for KM. However, only most respondents of BU 4 (40%) and BU 5 (57.1%) agree with these statements. The majority of respondents of BU 1 (57.1%) and BU 2 (75%) disagree with these statements and the responses in BU 3 are differentiated (27.3% disagree, 27.3% neither agree nor disagree, 27.3% agree and 18.1% agree). Table 29 also shows that all MT members agree that they provide the necessary resources for KM. A majority of BU 4 (80%) and BU 5 (76.2%) also agree. However, most respondents of BU 1 and BU 2 disagree that the MT provides the necessary resources for KM. The results for BU 3 indicate a differentiated view. These outcomes show the differentiation between responses of MT and employees.

4.2 INTERVIEW RESULTS

This paragraph provides an overview of the interview results. The interviews serve as exploratory measure to clarify differences or unclear outcomes in the survey responses of the four organizational units. Therefore, not all sub-variables of KM and independent variables are discussed and analysed in the interviews.

Knowledge management

Knowledge management consists of the sub-variables knowledge creation, caption, dissemination and application. Based on the survey outcomes, as discussed in paragraph 4.1, knowledge caption and application needed further clarification in the interviews.

KNOWLEDGE CAPTION

The first topic that is discussed in the interviews was knowledge caption. Interview respondents were asked to indicate if knowledge is actively captured in their BU and to what extent this is monitored or controlled. All interview respondents of BU 1 indicate that it differs per colleague whether or not knowledge is captured. Moreover, they argue that there is no standard and mandatory process to capture knowledge. One of the recurring problems that is mentioned in BU 1 is a lack of time to capture knowledge. Interview respondents also argue that there are no controlling mechanisms in place.

> *"Actively capturing knowledge really differs per colleague. It does not always happen correctly, for many colleagues it is not a structural workflow"*
> *-Interviewee BU 1 -*

Most respondents of BU 3 indicate that knowledge caption occurs. They argue that it is mandatory for them to capture information such as project history and meeting records. These are external requirements, and employees of BU 3 are held accountable for these requirements. There was one concern raised by an individual respondent of BU 3, administrative work, such as capturing knowledge, is not the first priority of many employees. There were differences of opinions between function levels in BU 3, about whether or not people are monitored if they capture knowledge. A MT member argues that employees are monitored if they capture knowledge, by using a dashboard, whereas an employee argues that they are not monitored, because it is an individual responsibility. All interview respondents of BU 4 argue that knowledge caption occurs in their BU. However, they also argue that there are no control mechanisms in place. Finally, all interview respondents of BU 5 indicate that knowledge caption occurs, due to very clear and strict processes and workflows. Control mechanisms are in place to monitor if employees capture knowledge.

The differences in the level of knowledge caption between BU's can, according to MT members, be explained by differences in the nature of work. BU 3 and BU 5 have contact with one organization and there is a recurring workflow in all projects. This makes it easier to determine when knowledge should be captured and to implement control mechanisms. Whereas BU 1 has contact with more than one organization for a longer period and the workflow differs per project, depending on the requirements and needs of the organizations. Moreover, the rules and procedures to capture knowledge are stricter for BU 3 and BU 5 due to external stakeholders.

KNOWLEDGE APPLICATION

BU 1 was the only BU where only a small majority agreed that knowledge application occurred, therefore, knowledge application is only discussed in interviews with participants of BU 1. They were asked to indicate if knowledge is applied in daily work processes and whether or not there are knowledge application processes in place. All interview respondents indicate that knowledge application occurs in their daily work. Knowledge that is retrieved from meetings, or colleagues is used in daily work processes.

There was one concern raised by an individual respondent of the management team, which is that there are differences between colleagues in the level of knowledge application. Some apply it more actively than others. Moreover, interview respondents of BU 1 indicate that there are no application processes in place.

Enablers

The enablers of KM, as discussed in this research, are culture, structure, strategy, rewards, leadership and training. Based on the survey outcomes, as discussed in paragraph 4.1, structure, strategy, leadership and training needed further clarification in the interviews.

STRUCTURE

The first sub-variable of organizational structure is formalization. Interview respondents were asked to indicate the extent to which their jobs are determined by rules and regulations and to indicate if there are control mechanisms in place. Moreover, they were asked to judge the organizational structure in their BU as formal or informal. Interview participants of BU 1 argue that there are few rules, guidelines and procedures, indicating a low level of job codification. A MT member argues that there is a defined framework, which only requires employees to define at which projects they are working on. Moreover, all interview participants of BU 1 indicate that there are no formal control mechanisms, there is a lot of freedom, indicating a low level of rule observation. All participants of BU 1 indicate that there is an informal organizational structure.

> *"There is freedom with given constraints. We create a framework, there are a limited number of rules and the limited number of rules is that you define at which projects you are working on. in the project database".*
>
> *- Interviewee BU 1 -*

All interviewees of BU 3 indicate that work processes are laid down in a handbook, which contains rules, regulations and guidelines and determines the work processes for BU 3, indicating a high level of job codification. One interviewee argues that not all employees use this handbook. There is no control whether or not people obey the rules, as laid down in the handbook, indicating a low level of rule observation. Still, all interview participants of BU 3 indicate that there is a formal organizational structure. One interview participant of BU 4 argues that the HRM section of BU 4 is informal, because there are less rules which define the work processes and there are few control mechanisms in place. The financial administration is considered more formal, because they have certain rules and control mechanisms in place, because of the nature of work. This shows, that in BU 4 it depends on the type of work, whether or not the organizational structure is formal or informal. Finally, all interview participants of BU 5 indicate that there are clear processes, rules and guidelines which determine work processes, indicating a high level of job codification. Moreover, the interview participants of BU 5 argue that rules have to be obeyed and that there are control mechanisms at different levels and in different process steps. Furthermore, there is an internal control system on dossiers. These control mechanisms indicate a high level of rule observation. All participants of BU 5 indicate that there is a formal organizational structure in their BU.

The differences in organizational structure, according to all MT members, can be explained by differences in the nature of work. The begin and end situation for BU 3 and BU 5 is clear, which makes it more easy to formalize processes and implement control mechanisms. Moreover, the external stakeholders of BU 5

also require some clear and standard procedures. The work of BU 1 is more difficult to grasp, because the begin and end situation is often not clear. The type of work also requires some informal structure, that inspire and allow people to be creative. Finally, one participant also argues that differences in size and leadership style can explain differences between the level of formalization in the BU's. BU 3 and BU 5 are smaller than BU 1, which makes it more difficult to have a formal structure, because this requires more rules and control mechanisms.

The second sub-variable of structure is centralization. The level of centralization is determined by the level of participation in decision making and the degree of hierarchy and authority. All participants of the BU's indicate that there is a central decision making structure. However, the interview participants do differentiate between decision making on organizational matters and decisions on work related issues. They argue that the MT decide on organizational matters and decisions on work related issues take place in lower levels. Still, there are differences per BU on the level of hierarchy and authority. Interview participants of BU 1, BU 3 and BU 4 indicate that there is a low level of hierarchy and authority. They indicate that there are rules and frameworks, but they do not need a lot of approval of higher management in work related processes and tasks, indicating a low degree of hierarchy and authority. Two participants argue that this is due to the high educational level of all employees. All interview participants of BU 1, BU 3 and BU 4 indicate that the organizational structure is decentralized. The interviewees of BU 5 indicate that they need approval in certain formal steps in processes and work related task. there is less responsibility for employees to fulfil tasks autonomously, due to the formalized work processes, indicating a high degree of hierarchy and authority. However, interview participants of BU 5 argue that they can operate more independent in informal related work issues. Most participants of BU 5 (3 out of 4) indicate that there is a centralized organizational structure.

STRATEGY

A KM strategy comprises a mission, vision and long term goals. Interview participants were asked to indicate if there is such a strategy. The interview results do not show differences in outcomes between the BU's. Half of the interview participants indicate that they do not know if there is a KM strategy, and what it contains. One participant particularly argued that it is not clear if there is a KM strategy, whereas another indicates that it is unknown whether there is a KM strategy or not. The other half of the participants argue that there is a KM strategy. However, their explanation of this strategy differs. One interview participant argues that the external technological developer has a clear strategy, but does not mention the organizational strategy. Moreover, some argue that the organizational reorganization is the strategy and others argue that more attention is given to develop a strategy, but they do not know exactly what it contains.

> *"I do remember that something was written about a vision. However, I have to admit that I do not know what it contains".*
>
> *- Interviewee BU 1 -*

Three of the five MT members indicate that there is an organizational strategy on KM. One MT member indicate that there is talked about such a strategy, but that it has not yet been written down. Some interview participants made some suggestions on the field of strategy. They suggested that a strategy on

KM would be useful, it would be good to specify the notion of KM, why it is important and what the overall organizational goal is.

TRAINING

Interview participants were first of all asked to indicate whether or not there was a training for KM. All interview participants answered that there is a training for KM systems, organized by the organization Blockx, who is also responsible for implementing these KM systems. They also indicate that these trainings were recently started and there were no trainings in the period when the survey was sent out. Moreover, interview respondents indicate that these training do not focus on informing employees on what KM means, and other KM related issues, such as when and how knowledge is captured and which knowledge should be shared et cetera. One employee argues that it is important to explain what the consequences are if someone does not fulfil their KM tasks. Another interview participant argues that it is of great importance that the meaning of KM is explained, because many employees focus only on the technological side of KM, where less attention is devoted to human and organizational enablers.

LEADERSHIP

First, interview participants were asked to discuss the leadership qualities of the MT. The first question was to what extent does the MT apply KM, this question was asked to both employees and members of the MT. Most interview respondents indicated that they do not know whether or not the MT applies KM. They argue that they do not have enough insight in the daily work of the MT. Two participants answered that it differs per MT member whether or not they apply KM. The members of the MT indicate that they apply KM in their daily work. However, they do argue that it can be improved and that it is not always transparent for employees.

Participants were also asked to indicate the importance of an exemplary role for the MT. Most participants argued that this is of great importance, because it will help to stimulate employees to apply KM, whereas one interview respondent argued that this is unnecessary. All members of MT also agree with this statement, they think that it is important that they fulfil an exemplary role. The MT also argues that due to the different BU's, it is difficult for employees to see whether or not the MT applies KM. Four MT members are BU-manager of the four organizational units. Therefore, the employees in a specific BU will most of the times only see how their BU-manager applies KM.

> *"I think that it is mandatory for all MT members to actively apply KM in daily work, there should be no discussion about this".*
>
> *- MT member -*

Moreover, participants were asked to indicate if the MT has the right leadership qualities to support the implementation of KM. "Leadership qualities" comprises the ability of the MT to apply KM in their daily work processes, but it also involves if the MT understands the meaning and implications of KM. This question was asked to three employees, two of them argued that there is some room for improvement. They argue that MT members should focus more on understanding the meaning and implications of KM and that they should be more actively involved in the KM process. One participant argues that the MT do have the right leadership qualities to support the implementation. The importance is clearly defined and they focus on a continuous improvement cycle. Two members of the MT argue that it is essential to show the importance of KM, they argue that this is one of the priorities of MT. Participants were also asked if

the MT stimulate employees to actively apply KM in their daily work. Overall, most participants indicate that the MT has a more stimulating role than before, however, they still argue that this stimulating role can be improved. One participant argues that the stimulating role of the MT is not noticeable. Moreover, one participant argues that not only the MT, but also sector managers should acquire a stimulating role in this process. Members of the MT argue that this stimulating role is one of their priorities and that they are actively trying to improve this.

Interviewees were also asked to indicate whether or not the MT provides the appropriate resources to apply KM. Most participants indicate that they do not know whether or not they have access to the appropriate resources. They argue that the new technological system is not yet introduced, so they cannot assess the appropriateness of the available resources. One members of the MT argue that the survey results for this question are outdated, due to technological developments. However, as already mentioned, most participants argue that the new technological system is not yet introduced, so they cannot assess the appropriateness of the available resources.

4.3 COMBINING RESULTS

This paragraph combines the results of the survey and interview. It first discusses the sub-variables of KM and it provides an answer to the sub-question: *"What organizational and human conditions are present in semi-public organization X?".*

Important to note is that due to the time between the data collection of the survey and the interview, some organizational changes were introduced, which affected the unit of analysis. BU 2 will stop existing, and the four employees will move to other BU's. At the time of the interviews, this change was not yet completed. No interviews are carried out with employees of the original BU 2. Moreover, the survey responses of respondents in BU 2 cannot be computed with responses of the other BU's, because the items specifically measure the current situation in the BU. Therefore, the BU IF is not further analysed in this research.

Knowledge management

Knowledge creation is defined as the first sub-variable of KM. A majority of survey respondents of BU 1 (72.9%), BU 3 (58.3%), BU 4 (66.7%) and BU 5 (81.8%) agree that knowledge creation occurs. It means that knowledge is created by transforming tacit or explicit knowledge into new content or by replacing existing knowledge. Therefore, this subject was not discussed in the interview. Based on the survey outcomes, **it can be concluded that knowledge creation occurs in BU 1, BU 3, BU 4 and BU 5** and should receive no further attention.

The second sub-variable of KM is knowledge caption. It means that knowledge is actively embodied in documentation, databases, organizational procedures and processes. The survey does not provide a clear outcome whether or not knowledge caption occurs in all BU's. Only a small majority of survey respondents of BU 1 (45.5%), BU 3 (50%) and BU 5 (59.1%) agree that knowledge caption occurs, whereas the survey results of BU 4 were differentiated (33.3% disagree, 33.3% neither agree nor disagree and 33.3% agree). Therefore, this variable was discussed in the interview. All interview respondents of BU 1 indicate that it differs per colleague whether or not knowledge is captured. They reported that there is no

standard and mandatory process to capture knowledge. This may explain why it differs per colleague whether or not knowledge is captured. Moreover, there are no control mechanisms in place. These outcomes, together with the survey outcomes (45.5% agreed, 36.4% neither agree nor disagree that knowledge caption occurred), show that **knowledge caption should receive more attention in the BU 1.** Most interview respondents of BU 3 indicate that knowledge caption occurs. They argue that it is mandatory for them to capture information, such as project history and meeting records. There was one concern raised by an individual respondent of BU 3, administrative work, such as capturing knowledge, is not the first priority of many employees. It was also not clear whether or not employees are monitored if they capture knowledge or not. These outcomes, together with the survey outcomes (50% agreed, 33.3% disagreed that knowledge caption occurred), show that **knowledge caption should receive more attention in BU 3.** In addition, all interview respondents of BU 4 argue that knowledge caption occurs in their BU. But they also argue that there are no control mechanisms in place. Therefore, when interpreting the survey outcomes (33.3% disagree, 33.3% agree, 33.3% neither agree nor disagree), in combination with the interview results, it is important that **knowledge caption receives more attention in BU 4.** Finally, all interview respondents of BU 5 agree that knowledge caption occurs, due to very clear and strict processes, workflows and control mechanisms. Thus, supporting the small majority who agreed in the survey. Therefore, **it is concluded that knowledge caption occurs in BU 5. MT members indicate that the differences in level of knowledge caption between the BU's can be explained by differences in nature of work.** Moreover, the rules and procedures to capture knowledge are stricter for BU 3 and BU 5 due to external stakeholders.

The third sub-variable of KM is knowledge dissemination. The survey outcomes show very clear that a majority of survey respondents of BU 1 (86.4%), BU 3 (66.7%), BU 4 (100%) and BU 5 (95.5%) agree that knowledge dissemination occurs. Respondents indicate that knowledge is actively exchanged and processed from one employee or unit to another. Therefore, **it is concluded that knowledge dissemination occurs in all BU's, and should receive no further attention.**

The final aspect of KM is knowledge application. A large majority of survey respondents of BU 3 (66.7%), BU 4 (83.3%) and BU 5 (72.7%) agree that knowledge application occurs, therefore no further clarification was needed in the interviews. **It can be concluded that knowledge application occurs in BU 3, BU 4 and BU 5**. Most respondents of BU 1 (50%) agreed that knowledge application occurred, still 27.3 percent disagreed and 22.7 percent neither agree nor disagree that knowledge application occurs in their BU. Therefore, this needed further clarification in the interview. Interviewees of BU 1 agree that knowledge is applied in daily processes, a weekly scheduled meeting is given as example. However, this meeting is only relevant for a part of BU 1, which may explain the relative small majority who agreed in the survey. Moreover, interview participants also argue that it differs per colleague whether or not knowledge is applied, because there are no processes which determine when and how knowledge should be applied. This final note, may be an important explanation of the relatively small majority of respondents who agreed in the survey. "Knowledge application processes" is one of the constructs of knowledge application, which may therefore lower the overall mean score of knowledge application. Indeed, once analysing the SPSS results again, most respondents (47.7%) of BU 1 disagreed that knowledge application processes are not applicable. Therefore, **it can be concluded that in BU 1 it differs per colleague whether**

or not knowledge is applied. This BU also does not have knowledge application processes. So, **knowledge application should receive attention in BU 1.**

Independent variables

ORGANIZATIONAL CULTURE

A culture of trust and social network are defined as the enhancing culture of KM. The survey outcomes show that a large majority of all respondents of BU 1 (90.9%), BU 3 (91.7%), BU 4 (100%) and BU 5 (90.9%) agree that there is a culture of trust and social networks. Therefore, this subject was not discussed in the interview. Based on the survey outcomes, **it can be concluded that there is a culture of trust and social networks in all BU's.**

ORGANIZATIONAL STRUCTURE

Organizational structure comprises the variables formalization and centralization. Survey outcomes show that most respondents in BU 1 (50%) neither agree nor disagree that there is a formalized organizational structure. 50 percent of the respondents agree that there is a certain level of job codification (still 27.3% disagree and 22.7% neither agree nor disagree), whereas most survey respondents disagree that there is a high level of rule observation (66.7%). Interview participants indicate that there are few rules, guidelines and procedures, indicating a low level of job codification. A MT member argues that there are only frameworks, which requires employees to define at which projects they are working on. This may explain why 50 percent of the respondents agree that there is a certain level of job codification. Moreover, interview participants also indicate that there are no formal control procedures, which does correspond with the survey outcomes. All interviewees of BU 1 indicate that there is an informal organizational structure. Based on these interview outcomes, which may explain the differentiated survey outcomes, it can be concluded that **there is an informal organizational structure in BU 1.**

100 percent of respondents in BU 3 agree that there is a high level of job codification. Interview participants also indicate that there is a high level of job codification, laid down in the handbook, which contains rules, guidelines and work processes. This corresponds with the survey outcomes. The survey also shows that most respondents (50%) neither agree nor disagree that there is a high level of rule observation. Interview participants indicate that they are not monitored whether or not they apply KM, indicating a low level of rule observation, which supports the 25 percent of survey respondents who disagree that there is a high level of rule observation. Still, one MT member argues that employees are being monitored. A low level of rule observation may explain why not all colleagues use the handbook and obey the rules. These contradictory outcomes, a high level of job codification, and a low level of rule observation may explain the differentiated survey outcome of whether or not there is a formalized organizational structure. 50 percent of the survey respondents in BU 3 neither agree nor disagree that there is a formalized organizational structure, where also 50 percent agree. Therefore, based on the survey and interview outcomes**, it can be concluded that there is a high level of job codification in BU 3**, **and a low level of rule observation**.

Most survey respondents of BU 4 (83.3%) neither agree nor disagree that there is a formalized organizational structure. The interview results may explain this outcome. In addition, one interview participant of BU 4 argues that the HRM section is informal, because there are almost no rules which

define the work processes and there are almost no control mechanisms in place. The financial administration is considered more formal, because they have certain rules and control mechanisms in place, because of the nature of work. The interview responses highlight that the differentiated tasks in BU 4, may explain the "in between" outcome of the survey. Thus, **HRM is considered informal, whereas the organizational structure of the financial administration is formal.**

Finally, a majority of respondents in BU 5 indicate that there is a formalized organizational structure (72.7%). All interview participants of BU 5 also indicate that there is a formalized organizational structure. Moreover, most survey respondents agree that there is a high level of job codification (77.3%), indicating a formalized organizational structure. All interviewees of BU 5 also indicate that there are clear processes, rules and guidelines which determine work processes, indicating a high level of job codification. However, most survey respondents (45.5%) neither agree nor disagree that there is a high level of rule observation (still 40.9% agree). Whereas interview participants argue that there are control mechanisms at different levels and in different process steps and internal control systems on dossiers. These control mechanisms indicate a high level of rule observation, supporting the 40.9 percent of survey respondents who also agree that there is a high level of rule observation. However, one interview participant argues that these control mechanisms are only at formal work processes and not on informal work processes. This may explain the differentiated survey outcome, where most respondents indicated that they neither agree nor disagree that there is a high level of rule observation. The survey did not allow respondents to make a distinction between informal and formal work processes. Therefore, **it can be concluded that BU 5 has a formalized organizational structure**, **with a high level of job codification and rule observation**, whereas the level of rule observation is less for informal work related issues.

The second variable of organizational structure is centralization. A majority of survey respondents of BU 1 (54.5%) disagree that there is a centralized organizational structure. Interview participants of BU 1 also indicate that there is a decentralized organizational structure. They do argue that they do not participate in decision making on organizational matters, which corresponds with the survey outcomes. Whereas, interview participants do argue that they participate in work related decision making, and that there is a low level of hierarchy and authority. This corresponds with survey outcomes, here 86.4 percent of respondents disagree that there is a high level of hierarchy and authority. Therefore, based on the survey and interview outcomes, it can be concluded that **there is a decentralized organizational structure in the BU 1**.

The survey outcomes of BU 3 (33.3% disagree, 33.3% neither agree nor disagree and 33.3% agree) and BU 4 (50% disagree and 50% neither agree nor disagree) are more differentiated. Interview participants of BU 3 and BU 4 argue that there is a centralized decision making on organizational matters, but decisions on work related issues are more decentralized. This distinction in decision making subjects could not be made in the survey, therefore this interview outcome may explain some of the differentiated outcomes of BU 3 and BU 4. Moreover, interview participant of BU 3 and BU 4 argued that there is a low level of hierarchy and authority, which is supported by the survey outcomes of BU 3 and BU 4. In addition, most interview participants of BU 3 and BU 4 assessed the structure as decentralized. Therefore, based on the survey outcomes and the interviews, it can be concluded that **there is a decentralized organizational structure in the BU 3 and BU 4.**

Finally, most respondents of BU 5 (54.5%) disagree that there is a centralized organizational structure, thus indicating that there is a decentralized structure, whereas 27.3 percent agrees that there is a centralized organizational structure. Interview participants of BU 5 all argue that there is a centralized organizational structure. They agree that the MT decides on organizational matters (centralized decision making), but decision making on work related issues is more decentralized. Moreover, participants indicate that they need approval in certain formal steps in processes and that there is less responsibility for employees to fulfil tasks autonomously, indicating a high level of hierarchy of authority. However, they can operate more independent in informal related work issues. These differentiated outcomes may explain that 54.5% of survey respondents disagreed, because the survey did not allow to make a distinction in organizational matters and work related issues in both decision making and the level of hierarchy and authority. Therefore, based on the interview outcomes, who explain the differentiated survey outcomes, **it is expected that BU 5 has a centralized organizational structure, but employees do participate in decision making on work related issues.**

STRATEGY

The survey outcomes show that there are differentiated outcomes between BU's about whether or not there is an KM strategy. Most respondents in BU 1 (47.1%) disagree that there is a KM strategy in place. Whereas, most respondents in BU 3 (62.5), BU 4 (100%) and BU 5 (66.7%) agree that there is a KM strategy in place. Still, it is important to note that there are 13 missing responses who indicate that they do not know whether there is a KM strategy or not. These differentiated answers were also found in the interviews. Half of the interview participants indicate that they do not know whether there is a strategy. The other interview participants indicated that there is a strategy, however, their explanation differs. One participant argues that the external technological developer has a clear strategy, but does not mention the organizational strategy. Moreover, other interviewees argue that the organizational reorganization is the strategy and others argue that more attention is given to a strategy, but they do not know what it contains. **The interview outcomes, the survey outcomes and the missing values of the survey** (cases whose mean score is "do not know**") indicate that it is very unclear whether or not there is a KM strategy and what it contains**. The outcomes of both the survey and interview show that organization X **should give more attention on the KM strategy**.

REWARDS

The survey outcomes show that a large majority of respondents of BU 1 (81.8%), BU 3 (83.4%), BU 4 (100%) and BU 5 (86.4%) indicate that there are extrinsic and intrinsic rewards in place for KM. However, important to note is that the extrinsic rewards do not include expected organizational rewards, such as bonuses, higher salary, promotion et cetera. A logical explanation is that these expected organizational rewards are not common in the (semi-) public sector (Liebowitz & Chen, 2003; Rainey, 1994). Based on the survey outcomes, **it can be concluded that there are rewards in place in the organizational units of organization X.**

TRAINING

Most survey respondents indicated that they have enough time and support to apply KM in their daily activities and projects. This is sometimes contradicted in the interviews, because interview participants indicate that a lack of time is often an issue. Moreover, the survey outcomes also show that 13 of the 67

respondents indicated that there was a KM training. The final 41 respondents indicated that there were no KM trainings in place. Interview participants argue that trainings for KM systems were recently started and there were no trainings when the survey was sent out. This shows that the survey outcomes regarding training are a bit outdated, because the survey and interviews were not carried out in the same period. There are still 13 respondents who indicated that there were trainings regarding KM. One possible explanation may be that these respondents may have misunderstood the question, because there are many general trainings that employees can follow in the organization. Moreover, interview participants indicate that the training for KM systems do not focus on informing employees on what KM means, and other issues, such as how to apply KM in daily work processes et cetera. Two interview participants argue that it is important to explain the notion of KM and what the consequences are if someone does not apply KM in their daily work. So, **it can be concluded that there is a training for KM systems, but there is no training which focuses on what KM means and other issues, which is perceived as important by some of the interview participants.**

LEADERSHIP

KM leadership consists of the variables leadership skills, leadership cooperation and leadership integration. The survey outcomes show that a majority of the respondents of BU 1 (65%), BU 3 (63.6%), BU 4 (100%) and BU 5 (76.2%) agree that the MT creates and supports cooperation between employees. This is also supported by the MT, 100 percent of the MT agrees that they create and stimulate cooperation between employees. Therefore, no further clarification was necessary in the interviews. **It can be concluded that the MT creates and supports cooperation between employees.** Moreover, the survey outcomes also show that most respondents in BU 1 (55%), BU 3 (50%) and BU 5 (81%) agree that the MT stimulates knowledge integration, this was also supported by the MT (80% agreed). Therefore, no further clarification was necessary in the interviews. **It can be concluded that the MT stimulates knowledge integration.**

However, the survey outcomes also showed some differences in responses between employees and MT members. All MT members agree that they acquire the right knowledge leadership qualities. Whereas only 40 percent of the respondents in BU 1, 50 percent of the respondents in BU 3, 20 percent of respondents in BU 4 and 70 percent of respondents in BU 5 agree that the MT has the right knowledge leadership qualities. Based on these differences, a single item analysis was performed in order to find the real differences per individual item. This highlights that **there are differences between employees and the MT in survey results regarding the item "The MT applies KM".** All MT members agree that they apply KM, whereas only most survey respondents of BU 1 (40%), BU 3 (50%) and BU 5 (70%) agree with this statement. 80 percent of respondents of BU 4 neither agree nor disagree. **Interview participants argue that they do not know whether the MT applies KM**, they indicate that they do not have enough insight in the daily work of the MT to see whether or not they apply KM. This may explain why there are differences in outcome between employees and the MT. The outcomes of the survey also showed differences between the MT and other employees regarding the item "the MT applies KM as an example for others". As already mentioned, interview participants indicate that they do not have enough insight in the daily work of the MT to see whether or not they apply KM. **Most interview participants do argue that it is of great importance that the MT applies KM as an example for others.** All members of MT also agree with

this statement. Based on survey and interview results **it can be concluded that the MT does not actively apply KM as example for others.**

Moreover, **the survey also showed differences regarding the item "the MT has excellent leadership skills"**. Two interview participants argue that there is room for improvement: MT members should focus more on understanding the meaning and implications of KM and they should be more actively involved in the KM process. Interview participants were also asked if the MT stimulate employees to actively apply KM in their daily work. Overall, **most interview participants indicate that the MT has a more stimulating role than before, however, they still argue that this stimulating role can be improved**. One participant of BU 5 argues that the stimulating role of the MT is not noticeable. Moreover, one participant argues that not only the MT, but also sector managers should acquire a stimulating role in this process. Based on survey and interview results **it can be concluded that MT does not focus enough on understanding the meaning and implications of KM, and active involvement.**

Conclusion

The combination of the survey and interview provide an answer to the sub-question: *"What organizational and human conditions are present in semi-public organization X?".*

All BU's indicate that an organizational culture of trust and social networks is present. In addition, BU 1 is assessed as informal and decentralized, BU 3 has a high level of job codification and a low level of rule observation and is decentralized. The HRM part of BU 4 is informal and decentralized, whereas the financial administration in BU 4 is formal and decentralized and BU 5 is assessed as formal and centralized. Furthermore, it is not clear whether or not there is a KM strategy in organization X. This is clearly supported by the high number of "missing responses" in the survey (people whose mean score is do not know) for the variable strategy. Moreover, the survey outcomes show that there are extrinsic and intrinsic rewards in place in organization X. However, these extrinsic rewards do not include expected organizational rewards, such as bonuses, higher salary, promotions et cetera. The empirical research also shows that there is a training on KM systems. There is no training which focuses on explaining what KM means and other KM related issues. Finally, the MT creates and supports cooperation between employees and they also stimulate knowledge integration. However, the MT does not actively apply KM as example for others, they do not fully understand the meaning and implications of KM and they do not acquire a stimulating role.

The survey outcomes also show that knowledge creation and dissemination occur in all organizational units of organization X. Moreover, based on the survey and interview outcomes, knowledge caption occurs in BU 5, whereas it should receive more attention in BU 1, BU 3 and BU 4. The survey outcomes indicate that knowledge application occurs in BU 3, BU 4 and BU 5, whereas based on a combination of outcomes of the interview and survey, knowledge application should receive more attention in BU 1.

4.4 MULTIPLE LINEAR REGRESSION ANALYSIS

The multiple linear regression is used to determine the relationship between the predictor variables (culture, formalization, centralization, strategy, rewards, training and leadership) and the dependent variable KM and its sub-variables (knowledge creation, caption, dissemination and application). The

model is described by a constant b0 and by parameters associated with each predictor (bs). The multiple regression is also used to determine the contribution of all predictors to the total variance (Field, 2013). Table 31 shows an overview of the multiple regressions that are carried out. The first multiple regression examines the relationship between the predictor variables and KM. The other multiple regressions examine the relation between the predictor variables and the sub-variables of KM (knowledge creation, caption, dissemination and application).

# Multiple regression	Predictor variables	Dependent variables
1	Culture, formalization, centralization, strategy*, rewards, training, leadership	Knowledge management
2	Culture, formalization, centralization, strategy*, rewards, training, leadership	Knowledge creation
3	Culture, formalization, centralization, strategy*, rewards, training, leadership	Knowledge caption
4	Culture, formalization, centralization, strategy*, rewards, training, leadership	Knowledge dissemination
5	Culture, formalization, centralization, strategy*, rewards, training, leadership	Knowledge application

* Strategy is without missing values, N=53

Table 31: Overview multiple regressions

Important to note is that some variables have missing values (people whose mean score is “do not know”). The category “do not know” is excluded and treated as missing response, because it otherwise influences the mean scores of the variables. The variable strategy has 13 missing values. When running the multiple regression in SPSS, there are several options to deal with missing values. In this research the option “exclude cases list wise” is used. It means that if a case has a missing value in one variable, the case is excluded for the whole analysis. Other options still include these cases; however, this may give unreasonable outcomes or may suppress the standard deviation and mean scores (Field, 2013). Due to this selection, only 53 cases are used in the multiple regression.

Furthermore, in a multiple regression it is important to decide how the predictor variables are entered into the model. According to Field (2013) it is best to choose for either hierarchical entry or forced entry, because the stepwise method relies on the computer who selects the variables based on mathematical criteria. The hierarchical (block wise entry) can be used when past work of researchers show which predictors are most important in predicting the outcome. The forced entry method is a method where all predictors are forced into the model at the same time. This method again relies on good theoretical arguments, but the variables are not entered in a specific order (Field, 2013). The predictor variables in this research are all selected based on good past research. However, because multiple researches have

been used, there is not always consensus about the influence of the predictor variables on the dependent variable. Therefore, in this research, the forced entry method is used.

LINEARITY AND OUTLIERS

In order to run a multiple regression, it is first of all important to check for linearity and outliers. Scatterplots of all predictor variables and dependent variables can be found in appendix H**.** All scatterplots show a positive linear relationship between the predictor variables culture, formalization, strategy, rewards, training, leadership and the dependent variables KM, knowledge creation, caption, dissemination and application. A negative relationship is found between the predictor variable centralization and the dependent variables KM, knowledge creation, caption, dissemination and application.

These scatterplots also show some potential outliers, which are examined in appendix I. It provides an overview of the case summaries: Cook's distance, Mahalanobis, leverage, standardized DFbeta and CVR, which highlight possible outliers. Table 32 shows a summary of possible outliers found in appendix I.

Multiple regression 1	**Multiple regression 2**	**Multiple regression 3**	**Multiple regression 4**	**Multiple regression 5**
Case 22 and 35	Case 35	Case 22	Case 22	Case 22 and 35

Table 32: overview of outliers per multiple regression

This table shows that case 22 and 35 may be seen as potential outliers. However, Stevens (2002) argues that if the Cook's distance is smaller than 1, "there is no real need to delete the case, because it does not have a large effect on the regression analysis" (p. 135). All cases have a Cook's distance greater than 1, therefore, case 22 and 35 are not deleted from the model.

To conclude, the scatterplots show a linear relation between the independent variables and the dependent variables. Moreover, the outcome of the Cook's distance show that there are no real outliers. These outcomes allow to run an initial regression to check for the assumptions.

ASSUMPTIONS

The initial regression is used to check whether the assumptions of linearity, homoscedasticity, independence, normality and multicollinearity are met. In appendix I, these assumptions are examined for all multiple regressions. For all five multiple regressions, the assumptions of linearity, homoscedasticity, independence and multicollinearity are met. However, the normality assumption is violated in all five regressions. Therefore, the bootstrap method is used in all five multiple regressions, to reduce the bias due to the violation of the normality assumption.

MULTIPLE REGRESSION 1: PREDICTORS → KNOWLEDGE MANAGEMENT

The first multiple regression focuses on examining the relationship between the predictor variables and the dependent variable knowledge management. Table 33 shows the linear model of predictors of KM, with 95% bias corrected and accelerated confidence intervals reported in parentheses. Confidence intervals and standard errors are based on 1000 bootstrap samples.

Table 33 shows that the R2 is 0.643, which shows how much of the variability in the outcome is accounted for by the predictors (Field, 2013). It means that the predictor variables culture, formalization,

centralization, rewards, leadership, training and strategy account for 64.3 percent of the variation in KM. The model parameters are also shown in table 33. The b-values show the relation between the dependent variable (KM) and each predictor. The standard errors (SE b) show to what extent these values would vary across different samples. The P value shows whether or not the b-value is significant (P<0.05) (Field, 2013). Table 33 shows that the dependent variables **formalization (0.256, p<0.05), leadership (0.219, p<0.05) and training (0.183, p<0.05) are all significant predictors of KM, thus supporting hypotheses H2a, H5 and H6.** H2a was formulated as a non-directional hypothesis, the outcome of multiple regression 1 shows that there is a positive significant relationship between formalization and KM. It means that as formalization increases with one (on a scale from 1 to 7), then KM increases with 0.220 (on a scale from 1 to 7). The variables **culture (0.042, p>0.05), centralization (0.002, P>0.05), rewards (0.060, P>0.05) and strategy (0.056, P>0.05) are no significant predictors of KM, which means that hypotheses H1, H1B, H3 and H4 are rejected.**

	b	SE b	Beta	P
Constant	1.126	0.03		P=.174
	[-0.572, 3.075]			
Culture	0.042	0.117	.043	P=.685
	[-0.230, 0.237]			
Formalization	0.256	0.071	.365	P=.003
	[0.106, 0.385]			
Centralization	0.002	0.071	.003	P=.968
	[-0.112, 0.159]			
Rewards	0.060	0.079	.071	P=.419
	[-0.076, 0.231]			
Leadership	0.219	0.085	.361	P=.016
	[0.051, 0.390]			
Training	0.183	0.092	.209	P=.046
	[0.003, 0.373]			
Strategy	0.056	0.065	.102	P=.391
	[-0.073, 0.181]			

R2: 0.643, adjusted R2: 0.588

* Bootstrap results are based on 1000 bootstrap samples

Table 33: Multiple linear regression 1 of predictors of KM (strategy without missing values, N=53)

MULTIPLE REGRESSION 2: PREDICTORS → KNOWLEDGE CREATION

The second multiple regression focuses on the relationship between the predictor variables and the dependent variable knowledge creation. Table 34 shows the linear model of predictors of knowledge creation, with 95% bias corrected and accelerated confidence intervals reported in parentheses. Confidence intervals and standard errors are based on 1000 bootstrap samples.

Table 34 shows that the R2 is 0.436, so the predictor variables account for 43.6 percent of the variation in knowledge creation. However, this table shows that **none of the predictor variables are significant predictors of knowledge creation. All variables have a P value larger than 0.05.**

	b	SE b	Beta	P
Constant	0.741	1.311		P=.568
	[-1.783, 3.455]			
Culture	0.164	0.182	.152	P=.318
	[-0.303, 0.464]			
Formalization	0.167	0.095	.217	P=.095
	[-0.033, 0.348]			
Centralization	0.040	0.099	.055	P=.263
	[-0.124, 0.263]			
Rewards	0.056	0.110	.061	P=.594
	[-0.136, 0.291]			
Leadership	0.200	0.131	.301	P=.141
	[-0.088, 0.440]			
Training	0.258	0.194	.269	P=.204
	[-0.063, 0.689]			
Strategy	0.000	0.087	-.001	P=.998
	[-0.184, 0.174]			

R2: 0.436, adjusted R2: 0.348

* Bootstrap results are based on 1000 bootstrap samples

Table 34: Multiple linear regression 2 of predictors of knowledge creation (strategy without missing values, N=53)

MULTIPLE REGRESSION 3: PREDICTORS → KNOWLEDGE CAPTION

The third multiple regression focuses on the relationship between the predictor variables and the dependent variable knowledge caption. Table 35 shows the linear model of predictors of KM, with 95% bias corrected and accelerated confidence intervals reported in parentheses. Confidence intervals and standard errors are based on 1000 bootstrap samples.

Table 35 shows that the R2 is 0.572, so the predictor variables account for 57.2 percent of the variation in knowledge caption. Moreover, it shows that the dependent variable **formalization is a significant predictor of knowledge caption (0.500, P<0.05).** As formalization increases with one (on a scale from 1 to 7), then knowledge caption increase by 0.500 (on a scale from 1 to 7). The variable **leadership is also a significant predictor of knowledge caption (0.295, P<0.05).** As leadership increase with one (on a scale from 1 to 7), then knowledge caption increases by 0.295 (on a scale from 1 to 7)**.** Finally, the table shows that the variable **strategy is also a significant predictor of knowledge caption (0.183, P<0.05).** As strategy increases with one (on a scale from 1 to 7), then knowledge caption increases by 0.183 (on a scale from 1 to 7). The predictor variables **culture, centralization, rewards and training are no significant predictors of knowledge caption (P>0.05).** The predictor variables **culture, centralization, rewards and training are no significant predictors of knowledge caption (P>0.05).** However, the table shows that culture is a "borderline case". It means that the p-value is very close to the cut-off level of 0.05 (Tshikuka et al, 2016). Tshikuka et al (2016) suggest to repeat the research with slightly larger sample sizes, to see whether or not culture becomes a significant predictor of knowledge caption.

	b	SE b	Beta	P
Constant	2.092	1.700		P=.193
	[-0.728, 6.066]]			
Culture	-0.399	0.207	-.278	P=.052
	[-0.911, -0.111]			
Formalization	0.500	0.116	.489	P=.001
	[0.258, 0.737]			
Centralization	-0.001	0.105	-.001	P=.992
	[-0.198, 0.204]			
Rewards	-0.016	0.149	-.013	P=.915
	[-0.252, 0.327]			
Leadership	0.295	0.123	.334	P=.027
	[0.083, 0.574]			
Training	0.074	0.165	.058	P=.648
	[-0.290, 0.346]			
Strategy	0.183	0.086	.230	P=.040
	[0.009, 0.343]			

R2: 0.572, adjusted R2: 0.505

* Bootstrap results are based on 1000 bootstrap samples

Table 35: Multiple linear regression 3 of predictors of knowledge caption (strategy without missing values, N=53)

MULTIPLE REGRESSION 4: PREDICTORS → KNOWLEDGE DISSEMINATION

The fourth multiple regression focuses on the relationship between the predictor variables and the dependent variable knowledge dissemination. Table 36 shows the linear model of predictors of KM, with 95% bias corrected and accelerated confidence intervals reported in parentheses. Confidence intervals and standard errors are based on 1000 bootstrap samples.

Table 36 shows that the R2 is 0.463, so the predictor variables account for 46.3 percent of the variation in knowledge dissemination. The table shows that the variable **training is the only significant predictor of knowledge dissemination (0.280, P<0.05).** As training increases with one (on a scale from 1 to 7), then knowledge dissemination increases by 0.280 (on a scale from 1 to 7). The variables **culture, formalization, centralization, rewards, leadership and strategy are no significant predictors of knowledge dissemination (P>0.05).**

	b	SE b	Beta	P
Constant	2.031	1.418		P=.151
	[-0.864, 4.759]			
Culture	0.044	0.198	.044	P=.835
	[-0.309, 0.435]			
Formalization	0.150	0.104	.212	P=.163
	[-0.072, 0.336]			
Centralization	-0.062	0.093	-.094	P=.521
	[-0.215, 0.141]			
Rewards	0.095	0.107	.111	P=.352
	[-0.107, 0.327]			
Leadership	0.163	0.098	.266	P=.104
	[-0.013, 0.375]			
Training	0.280	0.116	.318	P=.015
	[0.045, 0.512]			
Strategy	-0.017	0.084	-.031	P=.865
	[-0.170, 0.156]			

R2: 0.463, adjusted R2: 0.380

* Bootstrap results are based on 1000 bootstrap samples

Table 36: Multiple linear regression 4 of predictors of knowledge dissemination (strategy without missing values, N=53)

MULTIPLE REGRESSION 5: PREDICTORS → KNOWLEDGE APPLICATION

The final multiple regression focuses on the relationship between the predictor variables and the dependent variable knowledge application. Table 37 shows the linear model of predictors of KM, with 95% bias corrected and accelerated confidence intervals reported in parentheses. Confidence intervals and standard errors are based on 1000 bootstrap samples.

The R2 is 0.523, so the predictor variables account for 52.3 percent of the variation in knowledge application. The independent variable **formalization is a significant predictor of knowledge application (0.318, P<0.05).** As formalization increases with one (on a scale from 1 to 7), then knowledge application increases by 0.318 (on a scale from 1 to 7). The variable **strategy is also a significant predictor of knowledge application (0.239, P<0.05)**. As strategy increases with one (on a scale from 1 to 7), then knowledge application increases by 0.239 (on a scale from 1 to 7). The variables **culture, centralization, rewards, leadership and training are no significant predictors of knowledge application (p>0.05).**

	b	SE b	Beta	P
Constant	1.140	1.558		P=.442
	[-1.779, 4.279]			
Culture	-0.034	-0.183	-.024	P=.825
	[-0.419, 0.320]			
Formalization	0.318	0.107	.318	P=.003
	[0.086, 0.503]			
Centralization	-0.046	0.135	-.050	P=.729
	[-0.302, 0.244]			
Rewards	0.070	0.177	.058	P=.696
	[-0.331, 0.397]			
Leadership	0.238	0.153	.275	P=.106
	[-0.048, 0.553]			
Training	0.005	0.170	.004	P=.969
	[-0.269, 0.387]			
Strategy	0.239	0.105	.307	P=.019
	[0.022, 0.422]			

R2: 0.523, adjusted R2: 0.44

* Bootstrap results are based on 1000 bootstrap samples

Table 37: Multiple linear regression 5 of predictors of knowledge application (strategy without missing values, N=53)

Conclusion

The outcomes of the multiple regressions provide an answer to sub-question 3: *"What organizational and human conditions are, based on the empirical research, prerequisite for semi-public organization X, when effectively implementing KM?".* Important to note is that all multiple regressions violate the normality assumption. Therefore, the bootstrap method is used, to overcome the violation of the normality assumption. Table 38 provides an answer to sub-question three.

Hypotheses	Confirmed / rejected
H1: A knowledge management culture has a positive effect t on the perceived level of application of knowledge management	Rejected (0.042, p=.685)*
H2A: A formalized organizational structure has an effect on the perceived level of application of knowledge management	Confirmed (0.256, p=.003)*
H2B: A centralized organizational structure has a negative effect on the perceived level of application of knowledge management	Rejected (0.002, p=.968)*
H3: A knowledge management strategy has a positive effect on the perceived level of application of knowledge management	Rejected (0.056, p=.391)*
H4: Rewards has a positive effect on the perceived level of application of knowledge management	Rejected (0.060, p=.419)*
H5: Training has a positive effect on the perceived level of application of knowledge management	Confirmed (0.183, p=.046)*
H6: KM leadership has a positive effect on the perceived level of application of knowledge management	Confirmed (0.219, p=.016)*

* P=0.05

Table 38: overview confirmed/rejected hypotheses

The table shows that formalization, training and leadership are prerequisite conditions, when effectively implementing KM in semi-public organization X, confirming H2A, H5 and H6.

Moreover, table 39 shows a complete overview of the outcomes of multiple regressions which examined the relationships between predictor variables and KM and its sub-variables.

	KM	Creation	Caption	Dissemination	Application
Culture	0.042, p=.685	0.164, p=.318	-0.399, p=.052	0.044, p=.835	-0.034, p=.825
Formalization	**0.256, p=.003**	0.167, p=.095	**0.500, p=.001**	0.150, p=.163	**0.318, p=.003**
Centralization	0.002, p=.968	0.040, p=.263	-0.001, p=.992	-0.062, p=.521	-0.046, p=.729
Rewards	0.060, p=.419	0.056, p=.594	-0.016, p=.915	0.095, p=.352	0.070, p=.696
Training	**0.183, p=.046**	0.258, p=.204	0.074, p=.648	**0.280, P=.015**	0.005, p=.969
Leadership	**0.219, p=.016**	0.200, p=.141	**0.295, p=.027**	0.163, p=.104	0.238, p=.106
Strategy	0.056, p=.391	0.000, p=.998	**0.183, p=.040**	-0.017, p=.865	**0.239, p=.019**

Note**:** the bold figures show that there is a significant relation between the predictor variable and the variable of KM.
P=0.05

Table 39: overview of significant and non-significant predictors of sub variables of KM

This table shows that none of the predictor variables are significant predictors of knowledge creation. Formalization, leadership and strategy are significant predictors of the sub-variable knowledge caption. There is a positive significant relationship between these variables and knowledge caption. There is only a positive significant relationship between training and knowledge dissemination. Finally, formalization and strategy are significant predictors of knowledge application, both have a positive relationship with this sub-variable of KM.

5. DISCUSSION AND IMPLICATIONS

This chapter provides a discussion of the outcomes of the empirical research (interview and survey), the multiple regression and the theoretical framework. Based on this discussion, implications and limitations of this research are provided.

5.1 DISCUSSION

This paragraph discusses the empirical results in combination with previous research. It also provides areas for improvement for organization X, which is further discussed in the practical implications (paragraph 5.2).

The results show that **formalization, training and leadership** are **significant predictors of KM**, thus H2A, H5 and H6 are confirmed. Formalization, training and leadership help to increase the level of KM. **Culture, centralization, strategy and rewards** are proven to be **no significant predictors of KM**, thus rejecting H1, H2B, H3 and H4. Previous research of Yahya and Goh (2002) also examined the relationship between enablers and KM. They also found that training is a significant predictor of KM, which corresponds with findings in this research. This may show that training is an important enabler for both (semi-) public and private sector organizations. However, their research also found a significant relation between sub-variables of rewards and KM (Yahya & Goh, 2002), which contradicts with this research. A possible explanation is that their research is conducted in private sector organizations, where the use of rewards is more common than in (semi-) public organizations. They found a significant relationship between rewards in the form of monetary rewards and KM. Liebowitz and Chen (2003) and Rainey (1994) both argue that public sector organizations have more constraints on the use of monetary rewards (part of extrinsic rewards). This is supported by empirical results in this research, 76.2 percent of the survey respondents disagree that there are expected organizational rewards in place, such as bonuses, higher salary, promotions et cetera. **This contradiction highlights that there may be differences between enablers of KM in (semi-) public and private sector organizations**, particularly in the field of rewards. Yahya and Goh (2002) also used different measures for KM and rewards**, which may also indicate that differences in research outcomes are due to differences in methodological approach.** More empirical research is needed to further examine and determine predictor variables of KM in (semi-) public sector organizations and to examine the contradictions in research outcomes. Still, based on the outcomes of this research, areas of improvement for organization X can be determined. The results show that if the organization wants to implement KM, it must start with training. **Organization X should introduce training programs**, which focus on informing employees about what KM means and emphasizing the importance of human and organizational enablers. Moreover, since **BU 1** and **BU 4** are assessed as informal (see paragraph 4.3), they **should focus on determining a higher level of job codification** (rules, directives and guidelines on KM) and **BU 1, BU 3** and **BU 4 should implement control mechanisms**, which will help to increase KM. Finally, members of **MT should be actively involved, stimulate employees and fulfil an exemplary role** to stimulate the use of KM.

The results also show that **none of the defined enablers are proven to be significant predictors of knowledge creation.** This outcome contradicts with the research of Lee and Choi (2003). They found a significant positive relation between collaboration, trust, learning and knowledge creation, and a significant negative relation between centralization and knowledge creation. A possible explanation is that their research used different survey measures for culture, structure and learning, **which may indicate that differences in research outcomes are due to differences in methodological approach.** Another possible explanation is that Lee and Choi (2003) conducted their research in private sector organizations in Korea, whereas the sample for this research is conducted in a semi-public sector organization in the Netherlands**. This may highlight that there can be differences between (semi-) public and private organizations when implementing KM**, as mentioned by De Gooijer (2000) and Liebowitz and Chen (2003). Finally, **the survey results show that the perceived level of knowledge creation in all BU's is high** (71.6% of respondents agree that knowledge creation occurs), **whereas the research failed to significantly determine predictor variables.** This may indicate that the level of knowledge creation in this organization is enhanced by enablers that are not mentioned in previous research. Therefore, more empirical research is needed to further examine and determine predictor variables of knowledge creation and to examine if there are differences between public and private sector organizations when implementing KM.

Moreover, results show that **formalization, leadership** and **strategy** are **significant predictors of knowledge caption**. There is a positive relationship between these variables and knowledge caption. **Culture**, **centralization**, **rewards** and **training** are proven to be **no significant predictors of knowledge caption**. No previous empirical research is found which examines the relationship between enablers and knowledge caption. Therefore, this research provides evidence of significant predictors of knowledge caption. Still, more research is needed to further examine and determine predictor variables of knowledge caption, to be able to generalize these research findings to other situations. Still, based on the outcomes of this research, areas of improvement for organization X can be determined. Since **BU 1** and **BU 4** are assessed as informal (see paragraph 4.3), they s**hould focus on determining a higher level of job codification** (rules, directives and guidelines on KM) and **BU 1, BU 3 and BU 4 should implement control mechanisms** to increase the level of knowledge caption. Moreove**r, organization X should focus on leadership** (active involvement, stimulating and exemplary role) **and should define a KM strategy.** This strategy should consist of a mission, vision and strategy, which is aligned with the corporate strategy, to improve the level of knowledge caption.

Results also show that there is a **positive significant relation between training** and **knowledge dissemination.** This corresponds with the outcome of the empirical research of Yahya and Goh (2002). Moreover, **culture, formalization, centralization, strategy, rewards** and **leadership** are proven to be **no significant predictors of knowledge dissemination.** However, previous research did found a significant relationship between a culture of trust (Ismail Al-Alawi et al, 2007; Kim & Lee, 2006; Young Choi, Sik Kang & Lee, 2008), a culture of social networks (Connelly & Kelloway, 2003; Kim & Lee, 2006), centralization (Kim & Lee, 2006; Tsai, 2002), rewards (Ismail Al-Alawi, 2007; Kim & Lee, 2006; Lin, 2007; Young Choi, Sik Kang & Lee, 2008), leadership (Connelly & Kelloway, 2003; Yang, Huang & Hsu, 2014) and knowledge dissemination.

There are possible explanations for these contradictions. First, **research findings may simple be a reflection of the research design.** Which means that differences in research outcomes are due to different methodological approaches. Moreover, in this research, culture, centralization and rewards are no significant predictors of KM or its sub-variables. Whereas most previous research, who did found a significant relationship between these predictor variables and knowledge sharing, is conducted in private sector organizations. Therefore, these outcomes may highlight that **there could be differences in enablers of KM in (semi-) public and private sector organizations**, as indicated by Buelens and Van den Broeck (2007), De Gooijer (2000) and Liebowitz and Chen (2003). The research of Kim and Lee (2006) did examine enablers of knowledge sharing in both public and private sector organizations. However, they did not found differences in enablers of knowledge sharing between public and private sector organizations. They did argue that the organizational context of knowledge dissemination is different in public sector organizations. Public managers have to deal with more organizational constraints on knowledge dissemination, such as less rewarding systems, more centralization and formalization and lower levels of trust and social networks (Kim & Lee, 2007). This may highlight that there are no differences in enablers in (semi-) public sector and private sector organizations, but only the organizational context differs. More empirical research is needed to examine the contradictions in research outcomes and to further examine and determine predictor variables of KM in (semi-) public sector organizations. Still, based on the outcomes of this research, areas of improvement for organization X can be determined. **Organization X should provide training**, focusing on the meaning and implications of KM and its sub-variables, because it will help to increase the level of knowledge dissemination.

Finally, results show that **formalization** and **strategy** are **significant predictors of knowledge application**, both have a positive relationship with this sub-variable of KM. **Culture, centralization, rewards**, **leadership** and **training** are proven to be **no significant predictors of knowledge application**. The research of Kulkarni, Ravindran and Freeze (2006) also examined the relationship between enablers and knowledge application. They concluded that leadership and rewards are both significant predictors of knowledge use (Kulkarni, Ravindran & Freeze, 2006), which contradicts with research findings in this research. A possible explanation is that their research is conducted in private sector organizations, where the use of rewards is more common than in the public sector (Liebowitz & Chen, 2003; Rainey, 1994). **This contradiction highlights that there may be differences between enablers of KM in (semi-) public and private sector organizations**. Moreover, their research used different survey measures for knowledge application, leadership and rewards, **which may indicate that differences in research outcomes are due to differences in methodological approach.** Therefore, more research is needed to further examine and determine predictor variables of knowledge application in the (semi-) public sector, to be able to generalize these research findings to other situations. Still, based on the findings of this research, areas for improvement for organization X can be determined. Since **BU 1** and **BU 4** are assessed as informal (see paragraph 4.3), they **should focus on determining a higher level of job codification** (rules, directives and guidelines on KM) and **BU 1, BU 3** and **BU 4 should implement control mechanisms** to increase the level of rule observation. Moreover, **organization X should define a KM strategy**, consisting of a mission, vision and strategy, which is aligned with the corporate strategy, to improve the level of knowledge application.

5.2 IMPLICATIONS

The recommendations are based upon the discussion of the empirical results and the theory, as provided in paragraph 5.1.

Scientific implications

This study is called a “single outcome study”, which means that it tries to explain a single outcome for a single case (Gerring, 2006). This study examines the relation between predictor variables and KM for organization X. It is often argued that the scientific implications (generalizability) are limited for these types of studies. However, the main purpose of this study was first of all not to generalize research findings. Still, this research does have scientific implications. Many studies examined the relation between enablers and knowledge dissemination. There is much less understanding of the enablers of all sub-variables of KM. Therefore, the results of this research first of all contribute to the KM literature, by providing evidence of significant predictors of KM and all of its sub-variables. It provides a theoretical and methodological base, which can be used in further research, to be able to generalize the results to other situations. It also supports the theoretical assumption that multiple enablers are prerequisite when effectively implementing KM. This research shows that different enablers are significant predictors of KM and its sub-variables. Moreover, Seawright and Gerring (2008) argue that the generalizability of case studies can be increased by a strategic selection of cases. This case study can be characterized as extreme or exceptional case, which means that it differs from other cases. Previous research on enablers of KM used private sector organizations or public sectors organizations (mostly governments, municipalities or schools) as case study. No research is found which used a semi-public organization, or Dutch organization as case study. Exceptional cases are useful to provide a rich insight in previous researches and to maximize variance on the dimension of interest (Seawright & Gerring, 2008). Therefore, this research maximizes the variance of enablers of KM. Some research findings do correspond with previous research; results show that training is a significant predictor of KM and knowledge dissemination, which is supported by Yahya and Goh (2002). They conducted their research in the private organizations in Malaysia, which therefore may indicate that enablers of KM are the same in different organizational sectors. However, there are also some contradictions. No significant relationship is found between enablers and the sub-variable knowledge creation, whereas previous research of Lee and Choi (2003) did found a significant positive relation between collaboration, trust, learning and knowledge creation. Moreover, this research only found a significant positive relation between training and knowledge dissemination, whereas previous research also found a significant relation between culture, centralization, rewards, leadership and knowledge dissemination (Connelly & Kelloway, 2003; Ismail Al-Alawi et al, 2007; Kim & Lee, 2006; Lin, 2007; Tsai, 2002; Yang, Huang & Hsu, 2014; Young Choi, Sik Kang & Lee, 2008). This may elaborate the influence of different backgrounds of organizations when implementing KM (e.g. sector, country, type of organizations). Or that these differences may occur due to different methodological approaches. Therefore, further research is necessary to determine the causes of these contradictions. Finally, there are four equivalent organizations in the Netherlands, therefore, the results can be generalized to these organizations. As already mentioned, more research is necessary to be able to further generalize the results to other situations.

Practical implications

The practical implications of this single outcome study are multiple, because this study tried to explain which enablers are prerequisite when effectively implementing KM in organization X. Therefore, the recommendations are very specific for organization X.

- BU 1 and BU 4 should focus on determining a higher level of job codification. Which means that they should formulate rules, directives, guidelines and/or work processes on KM, such as when and how to capture and apply knowledge. This will help to increase the level of KM and knowledge caption in BU 1 and BU 4, whereas it will also help to increase the level of knowledge application in BU 1. Results show that in BU 1, it differs per colleague whether or not knowledge is captured and applied. Therefore, a higher level of job codification will facilitate employees in capture and apply knowledge in BU 1, because rules, directives and guidelines will determine when and how they should capture and apply KM. Moreover, BU 1, BU 3 and BU 4 should implement control mechanisms, to increase the level of rule observation, which will enhance employees to capture knowledge. A higher level of rule observation will also help to increase the level of knowledge application in BU 1.
- The MT should acquire a KM leadership role, which means that they should stimulate employees to apply KM, become more actively involved in the KM process and they should fulfil an - exemplary role. This will help to increase the level of KM and knowledge caption. Moreover, it is recommended that the MT evaluates the effectiveness of KM at a certain point in time (after one year for example), to be able to determine areas for improvement. In this evaluation, the MT should also evaluate the effectiveness of KM resources, because at the time of the interview, these were not fully introduced. This evaluation will help to constantly improve the effectiveness of KM.
- The organization should provide company training in which the notion of KM and other KM related issues are explained. They should clarify the concept of KM, which exists of different sub-variables and mention the importance of human and organizational enablers. A better know-how of employees will help to increase the level of KM, knowledge caption and knowledge dissemination.
- It is recommended that the organization should formulate a KM strategy, which comprises a mission, vision and strategy. A KM mission should comprise “why” KM is important for the organization. A KM vision should discuss “what” it is that the organization strives for. A KM strategy should elaborate “how” these goals will be achieved. It is important that the KM strategy is aligned with the organizational strategy, to explain how KM contributes in achieving the corporate strategy. An understanding of why, what and how will help to increase the level of knowledge caption and application.

Limitations

This research also has some limitations, which could be dealt with in future research. The first limitation is that this research is a single outcome study, which focuses on examining only one case study, and therefore the generalizability is limited. Still, the limitation of generalizability is of little relevance, because the main purpose of this research was never to generalize, but the intention was particularization.

Moreover, this case is an exceptional case, which will therefore help to maximize the variance of enablers of KM. It also provides a theoretical and methodological base, which can be used in further research. Second, this research is a cross-sectional case study, with time differences between the periods of data collection. The survey data is collected in June 2016, whereas the interview data is collected in November and December 2016. Due to this time period in between, there could be differences in perceived levels of respondents of the current situation of the dependent and independent variables. In this period, an organizational change was announced, which implies that BU 2 will stop existing. Employees of this BU will be divided over the other three BU's. Because this organizational change was not yet implemented, it did not affect the perceived level of the current situation of employees. To further deal with this limitation, interview respondents were asked to clarify if there occurred any discrepancies due to time differences between the survey and the interview. Another limitation of this study is that the data collection was based on perceptual measures of the dependent and independent variable. Moreover, this research has a small and limited sample size, therefore it is not possible to replicate the study with a larger sample, and to check whether the "borderline case" culture (-0.399, P=.052) becomes a significant predictor of knowledge caption. Finally, the level of difficulty of the survey is considered a limitation. This could lead to misunderstanding of the items, which may have influenced the overall results and therefore may have influenced the outcomes of the multiple regression. This limitation is partly diminished, due to the use of interviews as second method of data collection, which provides a more accurate view of the current situation in organization X.

Future research implications

The future research implications are based on the limitations of this study. First, it is useful to replicate the study with other samples, to be able to generalize the research findings to other situations and to reduce the lack of available research on enablers of KM and its sub-variables in the (semi-) public sector. This research provides a theoretical and methodological base, which can be used in further research. If possible, it would be good to use a larger sample size in further research, to deal with "borderline cases". To deal with the limitation of cross-sectional studies, it might be useful to conduct a longitudinal research. Moreover, contradictions in research findings may indicate that there could be differences between enablers of KM in public and private sector organizations, as already highlighted by some scholars. Therefore, further research should examine cases in both private and public organizations, to be able to examine similarities and differences. It is also useful to examine whether the differences in research outcome are due to methodological differences, differences in type of organization (e.g. sector, size) or differences in countries. Therefore, it is recommended to conduct research in different countries and use different types of organizations, to examine these differences.

6. CONCLUSION

This chapter gives a brief overview of the research and provides an answer to the sub-questions and main question.

The available literature highlights that a lesser extent of research is conducted that examines the relationship between enablers and all sub-variables of KM (knowledge creation, caption, dissemination and application). Most previous research examines the relation between enablers and knowledge dissemination. Moreover, many research is conducted in private organizations, even though some of the literature uses public sector organizations as case study, it is often limited to governments or municipalities in countries other than the Netherlands. No research is conducted in semi-public organizations. Therefore, the aim of this research was to examine which human and organizational conditions are prerequisite for a successful implementation of KM in the semi-public sector, to be able to successfully implement KM in organization X. A single outcome study is carried out in a semi-public organization in the Netherlands. The theoretical framework is defined by previous research that examined enablers of knowledge management and its sub-variables. This literature review, provides an answer to sub-question one: "*What organizational and human conditions are, based on the theory, prerequisite for the (semi-) public sector when effectively implementing knowledge management?".*

The literature review shows that there is a lack of available research of enablers and KM and all of its sub-variables. Still, based on the available literature it is assumed that an organizational culture of trust and social networks, formalization, a decentralized organizational structure, a KM strategy, KM leadership, rewards (extrinsic and intrinsic) and training are prerequisite when effectively implementing knowledge management in the (semi-) public sector.

The empirical research consists of a survey and in depth interviews with MT members and 2 employees per BU, to examine the perceived current situation in the semi-public organization. The outcomes of the survey and interview provide an answer to the second sub-question: *"What organizational and human conditions are present in semi-public organization X?"*

All BU's indicate that an organizational culture of trust and social networks is present. In addition, BU 1 is assessed as informal and decentralized, BU 3 has a high level of job codification and a low level of rule observation and is decentralized. The HRM part of BU 4 is informal and decentralized, whereas the financial administration in BU 4 is formal and decentralized and BU 5 is assessed as formal and centralized. Furthermore, it is not clear whether or not there is a KM strategy in organization X. This is clearly supported by the high number of "missing responses" in the survey (people whose mean score is do not know) for the variable strategy. Moreover, the survey outcomes show that there are extrinsic and intrinsic rewards in place in organization X. However, these extrinsic rewards do not include expected organizational rewards, such as bonuses, higher salary, promotions et cetera. The empirical research also shows that there is a training on KM systems. There is no training which focuses on explaining what KM means and other KM related issues. Finally, the MT creates and supports cooperation between employees and they also stimulate knowledge integration. However, the MT does not actively apply KM as example

for others, they do not fully understand the meaning and implications of KM and they do not acquire a stimulating role.

Finally, the results of the survey are used as input for the multiple regression, to statistically determine relations between enablers and KM and its sub-variables. These results provide an answer to sub-question three: *"What organizational and human conditions are, based on the empirical research, prerequisite for semi-public organization X when effectively implementing knowledge management?".*

Important to note is that all multiple regressions violate the normality assumption. Therefore, the bootstrap method is used, to overcome the violation of the normality assumption. The outcomes of the multiple linear regression significantly support hypotheses H2a, H5 and H6, which means that formalization, training and leadership are prerequisite when effectively implementing KM. Moreover, formalization, leadership and strategy are significant predictors of the sub-variable knowledge caption, there is a positive relationship between these variables and knowledge caption. Training is prerequisite when effectively increasing the level of knowledge dissemination. Finally, formalization and strategy are significant predictors of knowledge application, both have a positive relationship with this sub-variable of KM.

These sub-questions together provide an answer to the main-question, which is: *"Which organizational and human conditions are prerequisite for a successful implementation of knowledge management in a semi-public organization in the Netherlands?".*

BU 1 and BU 4 should focus on determining a higher level of job codification, to increase the level of KM and knowledge caption, whereas it will also help to increase the level of knowledge application in BU 1. Moreover, BU 1, BU 3 and BU 4 should implement control mechanisms, to increase the level of rule observation, which will enhance employees to capture knowledge. A higher level of rule observation will also help to increase the level of knowledge application in BU 1. The MT should acquire a KM leadership role, which means that they should stimulate employees to apply KM, become more actively involved in the KM process and they should fulfil an -exemplary role. This will help to increase the level of KM and knowledge caption. Furthermore, it is recommended that the MT evaluates the effectiveness of KM at a certain point in time (after one year for example), to be able to determine areas for improvement. In addition, the organization should provide training in which the notion of KM is explained, whereas there should also be room for discussing the KM strategy, to increase the level of KM and knowledge dissemination. Finally, it is recommended that organization X should formulate a KM strategy (mission, vision, strategy), to increase the level of knowledge caption and application. In which it is important that the KM strategy is aligned with the organizational strategy.

As already mentioned in the discussion (paragraph 5.1) some outcomes of this research contradict with previous research. These contradictions can be caused by differences in sector (private/public), cultural differences per country or differences in methodological approach. Therefore, further research is necessary to determine the causes of these differences. Moreover, it is also argued that the generalizability of this research is limited, because it is a single outcome study. However, the limitation of generalizability is of little relevance, because the main purpose of this research was never to generalize. Still, this research is useful, because it contributes to the KM literature, by providing evidence of

significant predictors of KM and all of its sub-variables. It provides a theoretical and methodological base, which can be used in further research and it maximizes the variance of enablers of KM. Still, more research is needed to examine enablers of KM and its sub variables in the (semi-) public sector. In addition, there are four equivalent organizations in the Netherlands, therefore, the results can be generalized to these organizations.

Finally, to overcome the limitations of generalizability, cross-sectional research design, perceptual based measures, small sample size and the level of difficulty of the survey, it is recommended to conduct further research. Further research should replicate this study with other (larger) samples, to be able to generalize research findings. Moreover, it would be useful to conduct a longitudinal research and use cases in both public and private organizations should, to be able to examine similarities and differences in enablers. Moreover, it is recommended to conduct research in different countries and use different types of organizations, to examine differences in research outcomes.

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8. OVERVIEW APPENDICES

Due to the size of the appendices, the appendices are provided in a separate report. This chapter provides an overview of the appendices and page numbers.