The Knowledge Network Game

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Knowledge is a key valuable asset of an organisation and a basis for innovation and sustainable competitive advantage. An aim of KM is to leverage the organisation’s collective knowledge in order to create benefits and success for the organisation. One of the factors that limits the use of available knowledge is that people are often unaware of the knowledge held by others. Mapping knowledge and thereby giving an employee an extended insight in who knows what beyond their direct social network can be valuable. The main results of this study are (1) a newly developed marketable KM workshop called the GuruScan Knowledge Network Game (KNG), which is grounded in theory and proven in practice, (2) an update of the insights in how KM literature and organisations view and value knowledge, knowledge networks and KM, and (3) identification of key KM interventions that could bring out the value of knowledge and knowledge networks in organisations.

The KNG is an active KM workshop that realises some of the desired KM outcomes and overcomes some the well-known problems. The KNG results in a social expert index and a visualisation of the social knowledge network within and adjacent to the participants group. The KNG is a compelling product that overcomes cynicism and laxity (specifically observed during one of the test sessions), and is generally reviewed by the participants as enthusing and useful. The four test sessions resulted in at least two organisations planning to do another KNG and participants saw and expressed the value of GuruScan on a larger scale. A KM literature review including topics as the concept of knowledge, transactive memory systems and knowledge management provided a basis for the underpinning of the KNG and other findings. The KNG is considered a success and further development and marketing is recommended.

In addition to the KNG, other key KM initiatives that can bring out the value of knowledge and knowledge networks are identified. These are based on the literature review and four explorative interviews with both knowledge and non-knowledge managers from public and commercial organisations. A Key KM initiative is the implementation of an organisation-wide expert finder system, especially in larger organisations. However, as the interviews indicate, do not only rely on and assume that employees fill in their own profiles based on intrinsic motivation. External motivation is likely required. Another initiative is the organising of events where people come together face-to-face such as CoPs, Knowledge Cafes, mentoring programs or workshops to share knowledge. This direct contact allows tacit knowledge to be shared. Further, it is recommended to implement a combination of KM IT systems and such events, one without the other is generally less effective. In addition, it is recommended to structurally evaluate projects, processes and initiatives. Lessons learned from these evaluation should be stored and disseminated throughout the organisation to support similar projects, processes and change initiatives in the future. Eleven of such action points are given.

Besides these findings, other points of interest have been identified that give an update of how KM literature and organisations view and value knowledge, knowledge networks and KM. A difference in approach and goal of KM between public and commercial companies is identified. That is, commercial companies focus on positive business metrics such as profitability, growth rate or other financial figures (risk, compliance, control); KM should always contribute to those. In contrast, the public organisations have a task (and are funded) to be a valuable knowledge resource to both internal and external parties. Here, KM is aimed to support this task of gathering, organising and making knowledge available, also to external parties. The identified difference between commercial and public companies was not found in the literature review. Further, KM literature often sees a person as a member of a larger group in which he or she shares knowledge, but little attention is given to personal knowledge management (PKM); how
a person individually learns, structures and applies his or her knowledge. One of the interviewees specifically promoted PKM and found it successful (Person C). It includes mind mapping and Getting Things Done. This PKM is an addition to the common collective-emphasising-KM. Other points of interest include the subjects of knowledge retention plans, employee’s insight in who knows what, and crucial knowledge.

This study provides a new and proven KM tool, additional KM recommendations, and points of interest that could form a basis for future research.
This master thesis was written as a graduation project for the Management and Technology track of Mathematics at the Radboud University Nijmegen, The Netherlands. This was my last step on my way to graduation.

The Management and Technology track gave me an opportunity to broaden my view beyond the borders of mathematics and learn about and experience challenges in business settings.

The vision and services of GuruScan directly appealed to me. That is, connecting people and helping them to find experts. I am really glad with the opportunity GuruScan gave me to perform my master thesis project at their company. I was especially delighted with the possibility to use my product design skills again to develop the Knowledge Network Game (before I started Mathematics, I finished a bachelor’s degree in Product Design). The knowledge network graphs, which can be created based on the data of the knowledge network game and other GuruScan services, are closely related to Graph Theory; a mathematical field I find interesting. This project allowed me to combine my different backgrounds and skills.

The field of knowledge management was new to me at the beginning of this project. I have learned a lot about all kinds of different aspects involved with knowledge management, both from theory and practice. Coming from a beta mathematical background, this project required me to get accustomed to doing social research, which was not always easy. I have also gained experience in formulating interview questions, conducting interviews, leading workshops, creating network graphs in Gephi and D3.js, graphic design, and more. This project has been a great experience for me.

I want to thank Heleen de Coninck for her support during previous stages of my master’s programme and this project, for bringing me in contact with Bart (what led to this project), for her critical view on my work and for her feedback and suggestions, even in the very last stages of finishing this thesis. I want to thank Bart Verheijen and Dion Slijp for giving me the opportunity to do my master thesis project at GuruScan, and for their help during my project; for helping me with programming questions, with writing my thesis, preparing for interviews, developing the KNG, conducting KNG test sessions and more. I also want to thank my other office mates Fakhar, Farbod and Willem for a great time. Last but not least, I want to thank my girlfriend Niki and my parents for their moral support and help!
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ABBREVIATIONS

The following abbreviations are used throughout this thesis:

CoP = Community of Practice
KNG = Knowledge Network Game
KM = Knowledge Management
KMS = Knowledge Management System
IT = Information Technology
TM = Transactive Memory
TMS = Transactive Memory System
1. INTRODUCTION

Knowledge is considered a key valuable asset of an organisation and a basis for innovation and a sustainable competitive advantage (Nahapiet & Ghoshal, 1998; Leonard & Sensiper, 1998; Wasko & Faraj, 2000). An aim of KM is to leverage the organisation’s collective knowledge in order to create benefits and success for the organisation. KM is mainly regarded as a process involving a minimum of creating, storing/retrieving, transferring and applying knowledge (Alavi & Leidner, 2001). However, knowledge management is also considered challenging (Swap, Leonard, Shields, & Abrams, 2001; Crane, 2011). Multiple perspectives on and approaches to managing knowledge have been developed (Boer, 2005; Crane, 2011; Fahey & Prusak, 1998). These different perspectives and approaches have led to a wide range of KM initiatives. This master thesis project describes a selection of KM related topics, different perspectives and approaches on KM, and results in a collection of points of interest regarding KM initiatives based on theory and practice.

One of the main reasons for these different KM perspectives, approaches and initiatives is the concept of knowledge itself (Alavi & Leidner, 2001). There are multiple perspectives on knowledge that lead to these differences in KM, and knowledge is categorised in many different ways. In order to understand where these different KM perspectives, approaches and initiatives come from, first the concept of knowledge itself is researched.

Organisations are run by people. These people have individual knowledge but also form groups, departments, teams et cetera. An organisation with multiple employees therefore contains collectives and can itself, as a whole, also be seen as a collective (Nahapiet & Ghoshal, 1998). Social knowledge networks (or just knowledge networks) explain the pathways by which knowledge is shared between actors. Barriers and motivations determine how these knowledge networks form and who shares what knowledge.

How knowledge in collectives functions can be explained by transactive memory systems (TMSs). TMSs are argued to facilitate fast and coordinated access to deep, specialized knowledge, in order to provide a greater amount of task-relevant expertise to be used for group tasks (Lewis, 2003). These TMSs are systems of directories used for encoding, storing, and retrieving information and knowledge within a collective (Wegner, 1995; Lewis, 2003). Transactive memory is individual memory that develops as a function that is based on a person’s beliefs about the knowledge possessed by the other person and also about the accessibility of that knowledge. Group transactive memory is considered to consist of the collection of individual members’ transactive memory (influenced by what other members know) plus member’s understanding of who possesses what knowledge. TMS exists when group members actively use their transactive memories to retrieve and combine others’ knowledge to perform a joint task (Lewis, 2003). This involves knowledge sharing between people which is influenced by barriers and motivations. It is argued that an organisation also develops organisational TMSs.

Having an adequate insight in ‘who knows what’ within the organisation helps develop effective TMSs and gives the individual access to the most valuable knowledge resources available within the organisation. Especially in large organisations it becomes is impossible to personally know all colleagues which leads to limited insights in those persons’ knowledge and accessibility. Expert finder systems map ‘who knows what’ within an organisation and help employees to find knowledgeable persons. GuruScan offers an expert finder system ‘Expert Guide’ that is based on endorsing others on knowledge topics instead of filling in one’s own profile (a method commonly used). This endorsing method uses the employees’
transactive memory’s to map ‘who knows what’. Thereby incorporating social and accessibility aspects which are important for effective knowledge sharing. An organisation’s filled in Expert Guide may be seen as a view on the incorporated TMSs.

The main goal of this master thesis project is to develop a KM workshop for GuruScan that is tested in practice, grounded in theory (e.g. transactive memory theory) and also proven commercially valuable for GuruScan. This workshop is purported to be more accessible than GuruScan’s other products and is based on the same endorsing principle. It is called the GuruScan Knowledge Network Game (KNG). The KNG enhances a groups’ TMSs and at the same time visualises a part of them. This can be used to identify potential knowledge gaps within the group or give external parties access to valuable knowledge resources.

This master thesis project results in a new KM initiative, the KNG, and describes other KM initiatives and related KM topics. These topics function as an underpinning and background for the KNG, but also offer additional points of interest to organisations, knowledge managers and others who are, or plan to, get involved in KM. The organisation GuruScan is explained next.
1.1 GURUSCAN

This section describes GuruScan including the GuruScan method and services.

1.1.1 GENERAL INFORMATION

GuruScan is a software and service company based in Nijmegen, The Netherlands. The company is founded by Dion Slijp and Bart Verheijen in 2008. Bart Verheijen is responsible for the operations, sales and finances. Dion Slijp is responsible for the vision, technology and innovation of the services. The company further employs one fulltime employee, several freelance workers and students.

1.1.2 GURUSCAN METHOD

GuruScan provides knowledge management tools and consultancy services. Both support the mapping and sharing of (tacit) knowledge within an organisation. GuruScan’s vision on knowledge, knowledge sharing and managing knowledge include:

- “Knowledge is more than information alone. Implicit (tacit) knowledge such as experience, skills and attitude are an integral part of knowledge.” (GuruScan, 2015)
- “Knowledge multiplies by sharing. The knowledge holder and the knowledge seeker both learn by sharing knowledge. They need each other and a direct reason, often a problem, for effective knowledge sharing.” (GuruScan, 2015)
- “Every organisation has objectives, and a strategy to reach them. The objectives and strategy should always be the starting and ending points of each knowledge management intervention.” (GuruScan, 2015)

The term GuruScan is also used to denote the underlying idea/method on which the products of the company are based. The method is based on a combination of three aspects: knowledge topics, employee profiles and endorsements. Employees of a company can create knowledge topics, e.g. ‘Microsoft Excel’, ‘selling cars’ or ‘playing the trombone’. Then, they can score themselves on these topics, from ‘no knowledge’, ‘beginner’, ‘advanced’ up to ‘expert’. They can also endorse someone else on these knowledge topics. This way, even when particular employees do not actively complete their own profile, a knowledge profile is created about them. A participation grade of 65% brings a coverage of knowledge profiles of 95%.

The gathered data can then be represented and analysed in different forms, such as tables and graphs (see figure 1 for example).
GuruScan makes knowledge on ‘who knows what’ accessible. This helps employees find an expert on a specific topic more easily and prevents struggling on your own and endless searching for expertise that is already available within the organisation. Time is saved by making the knowledge network within an organisation visible and available for use.

1.1.3 GURUSCAN SERVICES

GuruScan offers two services based on the GuruScan method: the Expert Guide and the Team Accelerator. The Expert Guide comes in two distinct ways. The first is a stand-alone SaaS web service, the second is as a Microsoft SharePoint (2010 or 2013) product.

Dion Slijp developed the Expertfinder concept within Océ in 2003. This later became the (SharePoint) Expert Guide. This is an online continuous service that can be integrated into the existing intranet environment of a company (and specifically SharePoint). Knowledge topics, employee profiles and endorsements can be changed and added continuously, similar to networks like LinkedIn or Facebook. Customers of GuruScan pay a monthly fee for using the Expert Guide, starting at € 250, per month, up to € 5000, per month or more, depending on the size of the organisation and features of the software. See Figure 2 for an example of a topic page of an implementation of the Expert Guide.

When promoting and explaining the concept of GuruScan, Bart noticed that interested companies (prospects) find it difficult to really understand the concept and see the potential for their company. In the past, GuruScan has already done different things to bridge this gap. For example, they developed a pamphlet to hand out, describing the benefits of using GuruScan, they created a video describing the concept in an appealing way (https://www.youtube.com/watch?v=i9U17rhBREU), and they developed a new product: the Team Accelerator.

The Team Accelerator is a workshop of one hour. During this workshop, knowledge within a group (max 30 persons) is uncovered and mapped using software similar to the Expert Guide. An employee of GuruScan leads the session. This service gives a snapshot of the knowledge within that group and the direct circle of people around them. The Team Accelerator starts at € 1800, per session. Figure 3 shows the software tool and steps used for the Team Accelerator workshop.

It is also possible to combine the above two services. For example, when one or more Team Accelerator workshops are held in an organisation, the gathered data can then be used to fill the Expert Guide.
**Figure 2. GuruScan Expert Guide** (source: internal documents of GuruScan). A screenshot of a topic page (the topic 'AVEVA PDMS', on Jan 16, 2013) of the GuruScan Expert Guide implementation for SBM Offshore. The participants are ordered based on level and number of references. Besides contact details and department, a photo of each participant is shown. This helps recognition when the knowledge searcher does not know the name.
The Team Accelerator uses PCs or laptops. Each participant uses the Team Accelerator tool to define knowledge topics, endorse other people and rate themselves. First (top left), a knowledge topic is defined (a title and a description). When typing the topic name, automatically is searched for similar topics. If the topic was already defined, it is suggested to select that topic in order to prevent duplicates. The second step (top right) is to endorse other people that you know have knowledge on the particular topic. The third step (bottom left) is to rate your own knowledge level. The best topics are discussed at the end of the workshop. After the workshop, analyses can be performed on the gathered data.

Figure 3 GuruScan Team Accelerator (source: internal documents of GuruScan).
1.2 RESEARCH OBJECTIVES

This master thesis project has multiple outcomes: a written master thesis and a physical product combined with a method; the Knowledge Network Game (KNG). The KNG is a workshop that can be executed under guidance of someone from GuruScan, but can also be bought as a standalone package of materials including a guide. This thesis project is aimed to result in a KNG that is proven in practice, grounded in theory and can be marketed immediately. To accomplish this, the concepts of knowledge, knowledge management and how organisations view and value those concepts are researched. In addition, test sessions of the KNG provide new contacts for GuruScan, give insight in the feasibility of such a product and possibly lead to further business with new or existing clients. Further, findings related to the KNG may also be valid for the other GuruScan products (Expert Guide and Team Accelerator) as they are based on the same method.

The main goals of this thesis project are to:

- Understand concepts of knowledge, knowledge management and how organisations view and value those.
- Develop a marketable workshop (GuruScan Knowledge Network Game (KNG)) that is proven in practice and grounded in theory.

1.3 RESEARCH QUESTIONS

The following research questions are answered in this study:

Main research question: How is the developed knowledge network game (KNG) helpful in bringing out the value of knowledge and knowledge networks in organisations?

1. What is knowledge?
2. How is knowledge handled by an organisation and how is it valuable?
3. What is knowledge management?
4. Develop the knowledge network game.
5. How do knowledge management literature and organisations view and value knowledge, knowledge networks and knowledge management?
6. What are key knowledge management initiatives that could bring out the value of knowledge and knowledge networks in organisations?

1.4 RESEARCH APPROACH AND METHODS

This section explains how the research questions are answered. Figure 4 displays a schematic overview of the research approach.
Figure 4. Schematic overview of the research approach.
1. **What is knowledge?**

This question is answered based on an extensive KM literature review. Common subjects such as the distinction between data, information and knowledge, and the distinction between tacit and explicit knowledge (including Nonaka’s spiral of organisational knowledge creation) are explored. Further, additional definitions of knowledge and perspectives on knowledge are discussed and categorized, giving an extended and thorough answer to the question ‘what is knowledge?’

2. **How is knowledge handled by a collective and how is it valuable?**

Organisations exist of collectives (e.g. groups, teams, departments, the organisation itself). Is knowledge held by a collective any different than the sum of the individuals’ knowledge of its members? How do collectives handle knowledge? These questions are answered based on a knowledge management literature review. This literature review includes the topics of collective knowledge, intellectual capital and transactive memory systems. Transactive memory theory is especially relevant to GuruScan’s products and the developed knowledge network game.

3. **What is knowledge management?**

Research question 3 is also answered based on a KM literature review. As a lot of subjects can be seen as a part of, or connected to, knowledge management, and not all subjects can be discussed, a selection is made. This selection is based on identified subjects within a discussion about KM among KM practitioners and includes: definition of KM, approaches to KM, KM strategies, knowledge sharing, culture, motivation, and evaluation of KM.

4. **Develop the knowledge network game (KNG).**

The development of the knowledge network game results in a physical product in combination with a methodology. The development of this product requires dealing with restrictions and desires from different parties on topics such as design, prices, suppliers, users, shipping et cetera. This involves the development and testing of different versions, with the goal of improving each version. Because product development is not a primary focus of this master thesis project, only the latest version is explained and a limited selection of development choices are discussed. A theoretical underpinning of the knowledge network game is given based on the findings from previous research questions. Specifically transactive memory theory is relevant. In addition, four test sessions are held in different organisations (clients or contacts of GuruScan). These sessions point to additional uses, benefits and future improvements of the KNG.

5. **How do knowledge management literature and organisations view and value knowledge, knowledge networks and knowledge management?**

Research question 5 is answered based on findings from answering research questions 1, 2 and 3 (literature review), and based on an explorative field research that consists of four semi-structured interviews with knowledge managers and other stakeholders in both public and commercial organisations. The interviews are used to acquire additional insights from practice in a selection of subjects, which are determined based on findings from the literature review.
6. What are key knowledge management initiatives that could bring out the value of knowledge and knowledge networks in organisations?

Research question 6 is answered based by combining findings from literature consulted for answering the previous research questions, with practice through the interviews. The answer includes a list of key KM initiatives that could bring out the value of knowledge and knowledge networks, which are based on theory and/or found beneficial in practice (interviews).

Main research question: How is the developed knowledge network game helpful in bringing out the value of knowledge and knowledge networks in organisations?

The main research question is answered based on the previous research questions.

1.6 OUTLINE OF THIS THESIS

Chapter 2 discusses the concepts of knowledge, knowledge handled by organisations, and knowledge management. This chapter is based on a KM literature review and gives a background to the conducted interviews and developed KNG in following chapters. First, in section 2.1, is the concept of knowledge discussed. This includes multiple categorisations, perspectives and definitions found in KM literature. Second, in section 2.2, the concept of knowledge held by an organisation is further explored. This includes the notions of collective knowledge, intellectual capital and transactive memory systems which describe how knowledge is handled by a group or organisation and how this can be ‘more’ than the sum of the knowledge held by its individual members. Third, in section 2.3 is the concept of KM discussed based on a selection of topics. These include a discussion of definitions of KM, common KM initiatives, objectification and personalisation strategies, the concept of knowledge sharing, intrinsic and extrinsic motivation, organisational culture and its effect on KM, and evaluation and measurement in relation to KM.

Chapter 3 discusses the semi structural interviews held with both knowledge and non-knowledge managers from public and commercial organisations. First, the main topics that are used for the interviews are discussed in section 3.2. Then, section 3.2 describes the results from the four interviews. These are used to answer research questions 5, 6 and the main research question.

Chapter 4 describes the developed knowledge network game (KNG). Section 4.1 explains the KNG including its items and the method of the workshop. Section 4.2 describes a selection of design choices made and section 4.3 described findings from four test sessions. The latter shows how the KNG is useful and valuable in practice. Section 4.4 gives a theoretical underpinning of the KNG based literature conducted. Sections 4.5 describes how the KNG is commercially valuable to GuruScan. Section 4.6 gives a list of proposed improvements to the KNG based on the findings from the test session and the current stage in the development process.

Chapter 5 answers the research questions as described in section 1.4.
Chapter 6 discusses notable findings, limitations and suggested future research.

Appendix A includes a more extensive description of the interview with Koman (in Dutch).
Appendix B gives a list of KM initiatives identified in the interviews.
Appendix C includes findings from interviews compared with KM literature.
Appendix D includes a guide for the KNG in Dutch.
2. ABOUT KNOWLEDGE AND KNOWLEDGE MANAGEMENT

The GuruScan products operate in the field of Knowledge Management (KM). The products help an organisation to (1) point out relevant knowledge topics for the organisation, (2) indicate persons (can be both from inside and outside the organisation) who are knowledgeable on these topics and (3) give insight in the knowledge network that connects these people. Insight in ‘who knows what’ and enabling employees find experts on knowledge topics are one of multiple possible methods (discussed later) that can help an organisation in “identifying and leveraging the collective knowledge in an organisation to help the organisation compete” (Von Krogh 1998); one view on what KM refers to. KM, however, is a complex field. There are different views on what KM is and what the goals of KM are. This is partly due to a “core issue in the lack of a widely accepted and understood definition of knowledge” (Crane, Longbottom, & Self, 2013, p. 1). Therefore, to better understand KM, it is necessary to examine the concept of knowledge first.

After answering the question ‘What is knowledge?’ more emphasis is given to knowledge in collectives, knowledge management and knowledge sharing.

2.1 WHAT IS KNOWLEDGE?

Before going into detail about topics such as collective knowledge, knowledge sharing and managing knowledge, it is important to look at knowledge itself. What is knowledge? And how is knowledge perceived?

Knowledge is a broad notion that has been subject of epistemological debate since the Greek era. Great thinkers such as Descartes, Plato and Kant were intrigued by the question “What is knowledge?” No consensus has emerged over time (Boer, 2005), (Glasbeek, 2014). The goal of this thesis is not to get involved in this epistemological debate, but instead only treat relevant perspectives on knowledge that contribute to the understanding of knowledge. An often used approach to deal with the concept of knowledge is to classify different kinds of knowledge or place it in perspective (Alavi & Leidner, 2001), (Blackler, 1995), (Boer, 2005), (Boisot, 1998), (Davenport & Lawrence, Working Knowledge: How organisations manage what they know, 2000), (Grant R. M., 1996), (Nonaka & Takeuchi, 1995), (Machlup, 1980), (Polanyi, 1966), (Weegeman, 2007) and others). This chapter discusses a number of popular approaches to knowledge and gives an insight in how the concept of knowledge has been, and can be, understood. This is relevant when dealing with knowledge management and related topic, as how knowledge is approached also affects what is considered knowledge management or how knowledge can or should be shared for example.

First, the notion of knowledge is placed in relation to data and information. Second, the “most widely discussed topics in knowledge management” (Grant K. A., 2007, p. 174), the tacit-explicit dimension, is treated. Third, additional perspectives on knowledge are given. And fourth, a conclusion is made based on the examined literature.

2.1.1 KNOWLEDGE IN RELATION TO DATA AND INFORMATION

Knowledge has been defined as a notion different from data and information. A motivation for this distinction comes from the knowledge management field: “If knowledge is not something that is different from data or information, then there is nothing new or interesting in knowledge management” (Fahey & Prusak, 1998, p. 265). Fahey and Prusak also mention that managers are often reluctant to deal with what
knowledge is, how it is different from data and information, and what implications these distinctions have. The authors argue that “[...] reflection on concepts and the distinctions among and between them is the essence of the process of ‘knowing’ or learning.”

Alavi and Leidner (2001, p. 109) and Rowley (2006, p. 163) acknowledge the popularity of the ‘knowledge hierarchy’ or ‘DIKW (Data Information Knowledge Wisdom) hierarchy’; it is “one of the fundamental, widely recognized and ‘taken-for-granted’ models in the information and knowledge literatures” (Rowley, 2006). In her analyses of sixteen popular information systems and knowledge management textbooks, she found that most books offer a description of data, information and knowledge that can be regarded as a definition of knowledge. Also Davenport & Prusak (2000), Alavi & Leidner (2001) and Boisot (Boisot, 1998 cited in (Boer, 2005, p. 19)) use a knowledge hierarchy to define and distinguish knowledge from data and information.

A commonly held view, with minor variants, is that data is raw numbers and facts, information is processed data and knowledge is authenticated information (Alavi & Leidner, 2001, p. 109). Rowley (2006) found that, among the reviewed sources, data is often defined in terms of what it lacks; data lacks value or meaning and is unorganized and unprocessed. Information is seen as organized or structured data that has been processed for a specific purpose or context and is therefore meaningful, useful, valuable and relevant. Knowledge is found an elusive concept that is hard to define. Some authors discuss the processes that convert information to knowledge or identify the ‘added ingredients’. Summarizing the examined definitions, Rowley notes that knowledge might be viewed as a mix of information, understanding, capability, experience, skills and values, but it is important to note that not all authors mention all of these elements. Despite being at the pinnacle of the DIKW (Data, Information, Knowledge, Wisdom) hierarchy, the term wisdom is found neglected in knowledge management and information systems literature. Jessup and Valacich (2003 in (Rowley, 2006)), as one of the few authors to mention wisdom, see wisdom as accumulated knowledge, which allows you to understand how to apply concepts from one domain to new situations or problems (Rowley, 2006, p. 174).

Even though this knowledge hierarchy is commonly used, it is not without criticism. Alavi & Leidner (2001) argue that “[...] the presumption of a hierarchy from data to information to knowledge with each varying along some dimension, such as context, usefulness, or interpretability, rarely survives scrupulous evaluation” (p. 19). The authors argue that the key to effectively distinguishing between data, information and knowledge is not found in the content, accuracy, structure or utility of the information or knowledge, but in the notion that knowledge is information possessed in the mind of individuals. It means that knowledge is personalized information (which may or may not be new, accurate, unique or useful) related to facts procedures, concepts, observations, ideas interpretations and judgements.

Another criticism comes from Tuomi (1999, p. 107). He argues that the knowledge hierarchy is actually reversed: knowledge leads to information which leads to data. In his view, there must be knowledge and information available before any data is created. There are no ‘isolated pieces of simple facts’ unless someone has created them using his or her knowledge. First, there must be a meaning structure, or semantics, fixed. Then this is used to represent information. And only then data can emerge. An example of such a process is the storage of information in a semantically well-defined database. In that case, knowledge has to be decontextualized and structured according to the predefined semantics into isolated and independent database entries. Ideally, the data so produced can be totally detached from any meaning, to be automatically processed using a computer program. “Data, therefore, exist as a solution to a practical problem: how to dissect information into two forms, data and data structure, which can be modelled, represented, and processed separately” (p. 107). Thus, in short, “raw data” do not exist; even
the most elementary piece of data has been influenced by thought or knowledge processes that led to this piece of data. (Alavi & Leidner, 2001). Alavi and Leidner (2001, p. 109) further argue that critical to Tuomi’s argument for a ‘reversed knowledge hierarchy’ is “the fact that knowledge does not exist outside of an agent (a knower): It is indelibly shaped by one’s needs as well as one’s initial stock of knowledge. [...] Knowledge is thus the result of cognitive processing triggered by the inflow of new stimuli”.

This ‘knowledge is personalised information’ view is a basis for Alavi and Leidner (2001) to give a description of knowledge in relation to information that essentially incorporates both a part of the original and reversed DIKW view. They posit that:

“Information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms.” (p. 109) (see also Figure 2 arrows 3 and 4)

This definition of knowledge has two implications according to the authors. First, for individuals to arrive at the same understanding of data or information, they must share a certain knowledge base. Second, systems designed to support knowledge in organisations may not appear radically different from other forms of information systems, but will be geared toward enabling users to assign meaning to information and to capture some of their knowledge in information and/or data. The authors focus on the distinction between knowledge and data/information, seemingly combining the latter (data and information) to one category.

Figure 5 shows a theoretical framework of data, information and knowledge based on the examined literature. The distinctions between the levels must be seen as gradient and in real life the distinction may not be clear.

**Figure 5. Data – Information – Knowledge hierarchy.** Based on (Alavi & Leidner, 2001) and (Rowley, 2006). Arrow 1: Information is organized or structured data that has been processed for a specific purpose or context and is therefore meaningful, useful, valuable and relevant. Arrow 2: Data lacks value or meaning and is unorganized and unprocessed. Information (theoretically) becomes data when all context, structure and relevance is stripped away. Arrow 3: Information becomes knowledge when it is processed in the minds of individuals. Arrow 4: Knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms.
Reflecting on the presented descriptions of knowledge in relation to data and information, at least three conclusions can be drawn. First, authors often make a hierarchical distinction of data, information, knowledge and sometimes higher notions like wisdom. It helps to emphasize the richness and contextual character of knowledge compared to other notions as data and information. All are related to information systems and knowledge management literature. Second, arguments for both directions of knowledge transformation (i.e. from data to information to knowledge and/or vice versa) can be given. Also, a combination of both directions is viable (Alavi & Leidner, 2001), (Rowley, 2006)). Third, one aspect of knowledge is often mentioned (e.g. Alavi and Leidner 2001, Davenport & Prusak 2000, Tuomi 1999 and (Weggeman, 2007)): knowledge is connected to, or even only existing in the mind of human beings. However, Boersma and Stegwee (1996) argue that knowledge can also be incorporated in entities other than human beings. The authors distinguish four forms of knowledge: human knowledge (where knowledge contained in the heads of the members of the organisation), mechanized knowledge (where the knowledge necessary to carry out a specific task has been incorporated in the hardware of a machine, e.g. embedded systems), documented knowledge (where knowledge has been stored in the form of archives, books, documents, charts, etcetera) and automated knowledge (where knowledge has been stored electronically and can be accessed by computer programs that support specific tasks).

In line with authors who emphasize that knowledge exists in the mind of human beings, mechanized knowledge, documented knowledge and automated knowledge are seen as information in this thesis. As noted by Boer (2005, p. 20), this distinction might become less clear within the field of artificial intelligence. There are artificial intelligence technologies that can interpret particular information within a particular framework and then can also act independently on it. Therefore, instead of limiting knowledge to human beings, a broadened notion of “intelligent acting agents with a capacity to learn” could be preferred. However, since this thesis focusses on the knowledge and knowledge networks of employees (human beings) within organisations, limiting the scope of knowledge to human beings is appropriate.

Thus, in this thesis, knowledge is assumed to exist inside humans. Information can exist both inside and outside humans.

2.1.2 EXPLICIT KNOWLEDGE, TACIT KNOWLEDGE AND SPIRAL OF KNOWLEDGE CREATION

The previous subsection elaborated on the distinction between data, information and knowledge. This subsection describes another popular topic: the distinction between tacit and explicit knowledge, also referred to as the tacit-explicit dimension. Grant (2007, p. 174) argues that this is one of the most widely discussed topics in knowledge management. The works of Polanyi (1962; 1966), Nonaka (1991; 1994) and Nonaka & Takeuchi (1995) have been, and still are, of great influence to the knowledge management field and discussions related to the subject of tacit and explicit knowledge. Grant (2007) argues that (Nonaka, 1991) can be seen as the pivotal work, which presents a new description of knowledge in an organisational context. In this paper, Polanyi’s famous quote “We can know more than we can tell” is first given circulation. Nonaka has built on his interpretation of Polanyi and makes the step from “At a fundamental level, knowledge is created by individuals” (1994, p. 17) to “organisational knowledge creation in a corporate setting” (1994, p. 21). Nonaka and his co-authors, including Takeuchi, have taken Polanyi’s work on “personal” knowledge and extended it to the field of organisational knowledge. A majority of authors have adopted Nonaka’s interpretation of Polanyi’s original explanation of tacit and explicit knowledge (Boer, 2005). However, Polanyi’s original explanation is found to be still relevant today (Grant K. A., 2007) and maybe even be more sophisticated and interesting (Boer, 2005). Therefore, Polanyi’s original explanation is also discussed.
First, Nonaka’s interpretation of tacit and explicit knowledge is explained, then Polanyi’s original concept is discussed and to conclude this subsection, a reflection on both views is given. The tacit-explicit distinction proposed by Nonaka is presented as a part of his ‘spiral’ model of knowledge creation. Discussing this model not only places the tacit-explicit dimension in its context proposed by Nonaka, but also provides a basis for further chapters about organisational knowledge, knowledge sharing and knowledge creation. It shows how these related terms can function in one model.

Nonaka’s tacit-explicit dimension within his Spiral of Organisational Knowledge Creation.

Nonaka (1994) proposed a paradigm for managing the aspects of organisational knowledge creating processes. He argues that organisational knowledge is created through a continuous dialogue between tacit and explicit knowledge and, while new knowledge is developed by individuals, organisations play a critical role in articulating and amplifying that knowledge (1994, p. 14). He identified two dimensions of knowledge creation: the epistemological and ontological dimension. His ‘spiral’ model of knowledge creation shows the relation between these two dimensions and illustrates the creation of a new concept in terms of a continuous dialogue between tacit and explicit knowledge. The epistemological and ontological dimensions and the four modes of knowledge creation are explained first and are then combined to form the ‘Spiral of Organisational Knowledge Creation’ (see Figure 6).

Epistemological dimension. The epistemological dimension is based on a distinction between tacit and explicit knowledge. In his view on (Polanyi, 1966), Nonaka sees ‘explicit’ or codified knowledge as knowledge that is transmittable in formal, systematic language. In contrast, ‘tacit’ knowledge has a personal quality, which makes it hard to formalize and communicate. Tacit knowledge is deeply rooted in action, commitment, and involvement in a specific context. He refers to Polanyi’s words and states that it ‘indwells’ in a comprehensive cognizance of the human mind and body (Nonaka, 1994, p. 16). Tacit knowledge, as Nonaka argues, involves both cognitive and technical elements. The cognitive elements focus on ‘mental models’ in which human beings form working models of the world by creating and manipulating analogies in their minds. These working models include beliefs, paradigms, schemata and viewpoints that provide perspectives that help individuals to perceive and define their world. The technical elements of tacit knowledge include concrete know-how, crafts and skills that apply to specific contexts. The epistemological dimension forms the vertical axis of the spiral model (see Figure 6).

Ontological dimension. The ontological dimension represents the level of social interaction of knowledge creation. Nonaka argues that knowledge is created by individuals and an organisation cannot create knowledge without individuals. Stimulating knowledge creation and knowledge sharing is important for a knowledge intensive organisation. It supports creative individuals or provides a context for such individuals to create knowledge. “Organisational knowledge creation, therefore, should be understood in terms of a process that ‘organisationally’ amplifies the knowledge created by individuals, and crystallizes it as a part of the knowledge network of the organisation.” (Nonaka, 1994, p. 17) He distinguishes different levels of social interaction at which the knowledge created by an individual is transformed and legitimized. For example, an informal community of social interaction provides a basis for developing new ideas. Such informal communities could span organisational boundaries (e.g. including suppliers, customers, distributors and competitors), enabling knowledge creation at an inter-organisational level. As is shown in Nonaka’s spiral model later on, the ontological dimension can be seen on an individual, group, organisational and inter-organisational level. The ontological dimension forms the horizontal axis of the spiral model (see Figure 6).
Four modes of knowledge creation. The spiral model is based on the assumption that knowledge is created through conversion between tacit and explicit knowledge. Nonaka identifies four different patterns of interaction between tacit and explicit knowledge that represent ways in which existing knowledge can be ‘converted’ into new knowledge. Table 1 shows four different ‘modes’ of knowledge conversion.

| Table 1. Modes of the knowledge creation (based on Figure 1 in (Nonaka, 1994, p. 19)). |
|---------------------------------------------|------------------|
| from Tacit knowledge to Explicit knowledge | Tacit knowledge  |
| from Tacit knowledge to Socialization       | Socialization    |
| from Explicit knowledge to Internalization  | Internalization  |
| from Explicit knowledge to Combination      | Combination      |

The Socialization mode of knowledge conversion (tacit to tacit) enables the conversion of tacit knowledge through interaction between individuals. For example an apprentice who learns craftsmanship by observation, imitation, and practice, not necessary through language. The Combination mode (explicit to explicit) involves the combination of different bodies of explicit knowledge held by individuals. Creating explicit knowledge from explicit knowledge can be done through meetings or telephone calls for example. New knowledge can emerge when existing information is sorted, added, recategorized and recontextualized (e.g. in databases). The Internalization (explicit to tacit) and Externalization (tacit to explicit) modes capture the idea that tacit and explicit knowledge are complementary and can expand over time through a process of mutual interaction. Nonaka relates Internalization to the traditional notion of ‘learning’ and sees ‘action’ as deeply related to the internalization process (for example the learning and understanding that results from reading or discussion (Alavi & Leidner, 2001, p. 116)). The notion of ‘metaphor’ plays an important role in the externalization process. He further notes that Socialization is connected with theories of organisational culture, Combination is rooted in information processing and Internalization has associations with organisational learning. However, “the concept of externalization is not well developed” (Nonaka, 1994, p. 19).

Nonaka argues that each of the four modes of knowledge conversion can create new knowledge on their own. However, key to his model is the dynamic interaction between the different modes of knowledge conversion. Knowledge creation is based on the building on both tacit and explicit knowledge and, more importantly, on the interchange between these two aspects of knowledge through internalization and externalization. The use of metaphors can be used in the Externalization mode to enable team members to articulate their own perspectives and reveal hidden tacit knowledge that is otherwise hard to learn.

Nonaka’s Spiral of Organisational Knowledge Creation. The epistemological and ontological dimensions, together with the four modes of knowledge creation (and all interactions between them), form the Spiral of Organisational Knowledge Creation.
Individual tacit knowledge is seen as the basis for organisational knowledge creation. This tacit knowledge is mobilized through a dynamic ‘entangling’ of the four modes of knowledge conversion (i.e. socialization, combination, internalization and externalization) in a process what Nonaka refers to as a ‘spiral’ model of knowledge creation). He notes that the interactions between explicit and tacit knowledge will tend to become faster in speed and larger in scale as more actors in and around the organisation become involved. “Thus, organisational knowledge creation can be viewed as an upward spiral process, starting at the individual level moving up to the collective (group) level, and then to the organisational level, sometimes reaching out to the inter-organisational level.” (Nonaka, 1994, p. 20)

Spender (Spender, 1996) followed Nonaka and argues that an individual or collective can hold knowledge and he also distinguishes tacit and explicit knowledge. Based on these two distinctions, he proposes four types of organisational knowledge: conscious knowledge (explicit knowledge held by an individual), objectified knowledge (explicit knowledge held by the organisation), automatic knowledge (tacit knowledge held by an individual) and collective knowledge (highly context-dependent knowledge which comprises both meaning (cognitive, affective, symbolic and cultural) and praxis (behaviours, rituals and organisational routines)). These four types can be seen in a 2x2 matrix of which one dimension is tacit-explicit and the other individual-collective.

The notion of knowledge held by a collective (e.g. group or organisation) is further discussed in section 2.2. The four types of knowledge by Spender also return in this chapter’s discussion of intellectual capital. Next, Polanyi’s original concepts of explicit and tacit knowledge are explained.

**Polanyi’s original concepts**

The distinction between tacit and explicit knowledge that Nonaka uses in his spiral model (1994, p. 16) is based on the pivotal work of Polanyi (1966). Authors often refer to both Nonaka and Polanyi together in regard to tacit and explicit knowledge. Although the works of Polanyi (Personal Knowledge: Towards a Post-Critical Philosophy, 1962) and (The Tacit Dimension, 1966) are among the most cited references in
knowledge management papers, they are often misinterpreted (Grant K. A., 2007, p. 173). The most frequent misinterpretation of Polanyi’s work also indicates a great difference in view on knowledge between Nonaka and Polanyi. Where Nonaka seems to make a strict distinction between tacit and explicit knowledge (i.e. as an either/or state), Polanyi emphasizes that all knowledge has a tacit element and that the degree of tacitness varies. In this view, the tacit-explicit dimension should be considered as a continuum. Furthermore, Polanyi did not write about knowledge in a corporate or organisational setting, but strictly about personal knowledge, which is also different from Nonaka’s approach. As a third, Polanyi did not discuss the term ‘implicit’ knowledge, which is often used an equivalent to tacit knowledge. Based on his review, Grant K.A. (2007) described a couple more misinterpretations.

Polanyi introduces the notions of focal awareness, subsidiary awareness and indwelling. Polanyi explains the difference between focal and subsidiary awareness by discussing the process of driving in a nail by strokes of a hammer. In this action we attend to both the nail and hammer, but in a different way. We watch the effect of the strokes of the hammer on the nail and try to wield the hammer in such a way that the head hits the nail most effectively. When we bring down the hammer we do not feel that its handle has struck our palm but that its head has struck the nail. Yet, in a sense, we are certainly alert of to the feelings in our palm and fingers that hold the hammer. These feelings guide us in handling it effectively, and the degree of attention that we give to the nail is given to the same extent but in a different way to these feelings. The difference may be stated by saying that these feelings are not, like the nail, objects of our attention, but instruments of it. They are not watched in themselves; we watch something else while keeping intensely aware of them. I could say that I have a subsidiary awareness of the feeling in the palm of my hand which is merged into my focal awareness of my driving in the nail (Polanyi, 1962, p. 57).

Polanyi further gives an example of how a blind man explores a cavity using a probe. This involves transporting the shocks transmitted from his hand and muscles into an awareness of the things touched by the point of the stick. This is a transition of ‘knowing how’ into ‘knowing what’. The man projects (without explicitly knowing it) the sensation in his hand on to the end of the probe, so that the probe tells the blind man the shape of the cavity. According to Polanyi the blind man has dwelled in, or interiorized, his hand, arm and body, by focusing on the end of the probe and the cavity (Brohm, 2005, p. 13). Further, focal and subsidiary awareness are mutually exclusive. Polanyi argues that our attention can only hold one focus at a time. Think of a pianist playing a piece. If he shifts his attention from the piece he is playing to the observation of what he is doing with his fingers while playing it, he gets confused and may have to stop. This happens generally if we switch our focal attention to particulars of which we had previously been aware only in their subsidiary role (Polanyi, 1962, p. 58). This kind of confusion, which is due to the shift of focal attention to the subsidiary elements of the action, is commonly known as self-consciousness. Another example is the phenomenon of ‘stage-fright’.

Summarizing, Polanyi observed a difference between knowledge of which we are explicitly aware, and knowledge that is implied in this awareness. This lead to distinct two levels of awareness: focal and subsidiary awareness. When we focus on a whole, we are subsidiary aware of its parts. This subsidiary awareness provides us clues that are integrated into a coherent whole or entity on which our attention can be focussed. This attention is focal awareness. Polanyi relates focal awareness to explicit knowledge and subsidiary awareness to tacit knowledge. Tacit knowledge is the content of subsidiary awareness together with performative and integrative skills. (Brohm, 2005, p. 13)

As mentioned before, to Polanyi, all knowledge has a tacit component. As one of three characteristic areas in which the relation between speech and thought varies from one extreme type to another extreme, he identifies “the area where the tacit predominates to the extent that articulation is virtually
impossible” (Polanyi, 1962, p. 90) as the ‘ineffable domain’. Polanyi later argues that “[f]or just as, owing to the ultimately tacit character of all our knowledge, we remain ever unable to say all that we know, so also, in view of the tacit character of meaning, we can never quite know what is implied in what we say.” (Polanyi, 1962, p. 99) As Grant (2007, p. 176) notes, this is a rather more complex statement than the often used quote “we can know more than we can tell” (Polanyi, 1966, p. 4), which was used as an introductory remark.

**Tacit and explicit knowledge defined**

Polanyi’s original explanation of tacit and explicit knowledge is more subtle, and possibly harder to grasp, than Nonaka’s explanation. From an organisational point of view, Nonaka’s definition is more practical in the sense that it is easier to explain and is often used within the KM field. Therefore, in this thesis, Nonaka’s explanation of tacit and explicit knowledge is used as a basis. This is in line with (Alavi & Leidner, 2001) for example. In addition, in line with Polanyi’s view, all knowledge is considered to have a tacit component. The tacit-explicit dimension can be seen as a continuum, where ‘explicit knowledge’ refers to knowledge with a low degree of tacitness, and ‘tacit knowledge’ refers to knowledge with a high degree of tacitness. These two additional assumptions imply that, whenever knowledge is shared or stored, there is a personal/contextual part left behind.

Explicit and tacit knowledge are defined as endpoints of a knowledge continuum or dimension in which the degree of tacitness varies:

- Tacit knowledge is knowledge that is deeply rooted in action, commitment, and involvement in a specific context. It has a personal quality and is hard to formalize and communicate. This knowledge can be unconscious (Glasbeek, 2014). Tacit knowledge is comprised of both cognitive and technical elements. The cognitive elements refer to individual’s ‘mental models’ consisting of mental maps, beliefs, paradigms, and viewpoints. The technical elements include concrete know-how, crafts and skill that apply to specific contexts (Nonaka, 1994). An example of tacit knowledge is knowledge of the best means of approaching a particular customer. For example using flattery, using a hard sell, or using a no-nonsense approach (Alavi & Leidner, 2001, p. 110).
- Explicit knowledge is knowledge that, up to a certain point (there is always a personal/contextual part lost), can easily be articulated, codified and communicated in symbolic form and/or natural language. This is conscious knowledge (Glasebeek, 2014). Explicit knowledge is also referred to as codified knowledge (Nonaka, 1994) or information (also see the discussion on data-information-knowledge). Alavi & Leidner (2001) give the example of an owner’s manual accompanying the purchase of an electronic product. They say that the manual contains knowledge on appropriate operation of the product. However, the manual can also be seen to only contain information that can lead to knowledge whenever it is read and internalized by the reader. Either way, what is contained in the manual lacks the context and reasons for why the manual is written this way, why the power button is placed where it is, et cetera. It lacks the broader context that the people who worked on the product and manual do have. This explicit knowledge, codified knowledge or information is based on more complex contextual knowledge of which a part is left behind by making the knowledge more explicit. In line with the assumption that knowledge resides in human beings, ‘explicit knowledge’ is assumed to exist inside the human. Once it is codified (e.g. in texts, words, symbols, movies, sound) and becomes to exist outside the human, this ‘codified knowledge’ is considered information.
Tacit and explicit knowledge are not to be seen as fixed terms. They are, just like knowledge itself, multi-interpretable. When talking about knowledge or knowledge management for example, the terms can be used to indicate how well the knowledge of subject is likely to be able to be explained, articulated, communicated and be seen separately from its (personal) context. In practice, tacit knowledge is also referred to as implicit or silent knowledge (Glasbeek, 2014) and explicit knowledge as codified knowledge or information.

2.1.3 TWO ADDITIONAL DEFINITIONS OF KNOWLEDGE

Two common additional definitions of knowledge are given.

Nonaka (1994, p. 15) uses the definition of knowledge as a “justified true belief”. This definition is also credited to Plato and is similar to his definition: “knowledge equals true opinion, accompanied by reason” (Theaetetus 201c in (Glasbeek, 2014, p. 4)). Nonaka states the importance of seeing knowledge as a personal “belief” and emphasizes the importance of the “justification” of knowledge. Within the theory of knowledge creation, knowledge is seen as a dynamic human process of justifying personal beliefs as part of an aspiration for the “truth”.

Weggeman (2007, p. 246) asserts that knowledge (K) is a function of information (I), experience (E), skills (S) and attitude (A): K = f(I x ESA). He views knowledge as a personal ability to perform a certain task: an ability that can be viewed in a metaphorical way as the product of the information, the experience, the skills and the attitude that a person possesses at a particular moment in time. The author views knowledge as an input factor that enables production, just as land, labour and capital enable production. In a data intensive society, where the amount of available data increases and the average validity of data decreases, it is important to rely more and more on the knowledge of employees who, within their field, act as stand-alone actors or teams. This will also increase the job satisfaction. Weggeman further assumes that knowledge cannot exist outside the mind of the individual. Knowledge cannot be separated from its holder, you cannot build a stock of knowledge and knowledge cannot be assured, as it is illegal to keep people in captivity based on the fact they have knowledge. Also, you cannot transfer ‘packages of knowledge’ from one person to another, and knowledge cannot be stored in machines or databases. What is possible for a person, is to study or imitate another person (e.g. learning by doing or based on a master-apprentice relation) in order to gain insight in the nature and scale of the other persons knowledge. From personal experience, Weggeman’s definition and view on knowledge is found to be regularly used by, or could be seen as the standard amongst, Dutch knowledge workers.

2.1.4 KNOWLEDGE CATEGORIZED

Previous chapters have already shown different facets of knowledge: tacit-explicit knowledge, DIKW hierarchy, knowledge only exists inside humans?, and individual-group-organisational knowledge (more on collective knowledge in section 2.2). Such categorizing of knowledge is an often used practice by authors (e.g. (Alavi & Leidner, 2001); (van den Berg, 2008); (Wiig, 1993); (Boisot, 1998); (Nijssen & Le Cat, 2009) and (Wasko & Faraj, 2000)) and emphasizes the multifaceted character of the notion ‘knowledge’. Table 2 shows a summary of these perspectives and provides additional perspectives that have been identified in KM literature. This gives a comprehensive overview of some of the more popular perspectives on knowledge.
Table 2. Perspectives on knowledge.

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<thead>
<tr>
<th>Perspectives on knowledge</th>
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<tr>
<td>Data – Information – Knowledge (DIKW hierarchy).</td>
<td>Data is facts, raw numbers. Information is processed/interpreted data. Knowledge is personalized information (Alavi &amp; Leidner, 2001). The hierarchy is actually reversed: knowledge comes before information and data (Tuomi, 1999). Transitions can be in both directions: Information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms. (Alavi &amp; Leidner, 2001, p. 109) Knowledge might be viewed as a mix of information, understanding, capability, experience, skills and values. (Rowley, 2006) (Similar to Weggeman’s definition.)</td>
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<tr>
<td>Tacit – Explicit knowledge</td>
<td>Tacit knowledge is rooted in action, commitment, and involvement in a specific context. It has a personal quality and is hard to formalize and communicate, it can be unconscious and is comprised of both cognitive and technical elements. Explicit knowledge is knowledge that, up to a certain point, can easily be articulated, codified and communicated in symbolic form and/or natural language. This is conscious knowledge. The notions of tacit and explicit knowledge should be seen as endpoint of a continuum instead of an either/or state of knowledge. (see previous chapter, based on Polanyi) All knowledge is considered to have a tacit component (Polanyi, 1966) and whenever knowledge (earlier assumed to only exist within human beings) is shared or stored, there is always a personal/contextual part left behind. In this thesis, explicit knowledge is assumed to exist inside the human. Once it is codified (e.g. in texts, words, symbols, movies, sound) and becomes to exist outside the human, this ‘codified knowledge’ is considered information.</td>
</tr>
<tr>
<td>Knowledge exists in...</td>
<td>Many authors (e.g. Alavi and Leidner (2001), Davenport &amp; Prusak (2000), Tuomi (1999) and (Weggeman, 2007)) pose that knowledge is strongly connected to, or even only existing in the mind of human beings (Weggeman, 2007). Van den Berg (2008, p. iii) also distinguishes knowledge that resides in human minds. Just as Blackler (1995) with ‘embrained’ and ‘embodied’ knowledge, and Boersma and Stegwee (1996) with ‘human knowledge’. Wasko &amp; Faraj (2000) also distinguish this ‘knowledge is embedded in people’ perspective which views knowledge as “not easy to separate from its human actor and only meaningful and actionable to those who are already knowledgeable” ( (Hansen, Nohria, &amp; Tierney, 1999) in (Wasko &amp; Faraj, 2000)). These characteristics can also be related to the tacitness of this knowledge.</td>
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In this thesis, knowledge is assumed to exist inside humans. Information can exist both inside and outside humans.

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<td>Similar to humans, one could argue that animals have knowledge. To what extent a person believes an animal has knowledge could influence his or her behaviour. For example, a person who appreciates intelligent animal behaviours may make certain lifestyle choices that other people won’t, for instance, in regards to the consumption of meat or fish. “Obviously, the lives of these individuals will be very different compared to those who merely see animals as a tasty protein-packed resource in desperate need of a decent sauce”. (Glasbeek, 2014, p. 3) However, the question to what extend an animal has knowledge is of limited relevance to this thesis.</td>
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<th>Collectives (social aspect)</th>
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<td>The concept of viewing knowledge on different levels (e.g. individual, group, organisation) is briefly discussed in relation to Nonaka’s spiral of knowledge creation. Nonaka sees individual tacit knowledge as the basis for organisational knowledge creation. This tacit knowledge is mobilized through a dynamic ‘entangling’ of the four modes of knowledge conversion (i.e. socialization, combination, internalization and externalization) in a process what he refers to as a ‘spiral’ model of knowledge creation. One of the questions regarding knowledge in relation to collectives is whether there exists something like ‘collective knowledge’? And if this is ‘more’ than the sum of the individual knowledge of the members? For example, Wasko &amp; Faraj (2000) distinguish the ‘knowledge embedded in a community’ perspective that views knowledge as a public good that is “socially generated, maintained, and exchanged within emergent communities of practice” (Wasko &amp; Faraj, 2000, p. 156) referring to (Brown &amp; Duguid, 1991), (Lave, 1988) and (Lave &amp; Wenger, 1991)). In this perspective, knowledge is seen as an intangible good that can be shared in communities without losing its value, nor being used up in the transfer processes. This perspective emphasizes the social aspect of knowledge. Blackler (1995) also refers to this social aspect with ‘encultured knowledge’. The topics of collective knowledge and knowledge sharing are further discussed in sections 2.2 and 2.3.4. It is shown that different views exist to these questions and that relations, social networks and knowledge sharing play an important role.</td>
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<th>Texts, databases, hardware, physical artefacts et cetera (Knowledge as an object perspective)</th>
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| An underlying basis for the assumption that knowledge can exist in for example books, manuals and databases, is the perspective that knowledge can be seen as an object that can be stored and manipulated (Carlsson et al. 1996; McQueen 1998; Zack 1998a in (Alavi & Leidner, 2001, pp. 109-110)). Also Wasko & Faraj (2000, p. 156) recognizes this ‘knowledge as an object’ perspective. They pose that this object exists independently of human action. Van den Berg (2008, p. iii) speaks about ‘knowledge that is codified as information’ and Blackler (1995) about ‘encoded knowledge’, what is information conveyed by signs and symbols. Boersma and Stegwee (1996) identify mechanized knowledge (where the knowledge necessary to carry out a specific task...
has been incorporated in the hardware of a machine, e.g. embedded systems),
documented knowledge (where knowledge has been stored in the form of archives,
books, documents, charts, etcetera) and automated knowledge (where knowledge
has been stored electronically and can be accessed by computer programs that
support specific tasks). Related to this view, Van den Berg (2008, p. iii) identifies
knowledge that is embodied in the design and functionality of physical artefacts
(encapsulated knowledge).

In line with Alavi and Leidner and Weggeman, in this thesis, this ‘knowledge as an
object’ perspective is seen as equal to ‘information’.

In addition to the ‘knowledge as an object’ perspective, Alavi and Leidner (2001, pp.
109-110) distinguish the perspective of ‘knowledge as a condition of access to
information’, which emphasizes the importance of organizing the organisational
knowledge to facilitate access to and retrieval of content ((McQueen, 1998) in (2001,
pp. 109-110)). This perspective can be seen as an extension of the ‘knowledge as an
object’ view with an emphasizes on the accessibility of knowledge objects.

| Routines | Blackler (1995, p. 1024) distinguishes embedded knowledge that resides in systemic
routines. “Embedded knowledge is analyzable in systems terms, in the relationships between, for example, technologies, roles, formal procedures, and emergent routines.” |
| Knowledge related to... | When regarding a certain knowledge topic, there are always more sides to the story. One could argue that in order to get a more complete picture, the following five types of knowledge play a role (types based on ((Nolan Nortan, 1998) and (Zack 1998c) in (Alavi & Leidner, 2001, pp. 112-113)):
1. Declarative knowledge (know-about). For example: what drugs are important for an illness.
2. Procedural knowledge (know-how). For example: how to administer a particular drug.
3. Causal knowledge (know-why). For example: understanding why the drug works.
4. Conditional knowledge (know-when). For example: understanding when to prescribe the drug.
5. Relational knowledge (know-with). For example: understanding how the drug interacts with other drugs. |
| Practical versus theoretical knowledge | For all these five types of knowledge a theoretical and practical basis can be useful. However, naturally, causal knowledge (know-why) is likely to be often related to a more theoretical foundation and procedural knowledge (know-how) to a more practical basis.
Knowledge that is based on a relatively large theoretical basis is also called ‘embrained knowledge’ (Blackler, 1995). This is knowledge that is dependent on conceptual skills and cognitive abilities. This is what Ryle (1949, p. 117) called... |
‘knowledge that’ and James (1950) refers to as ‘knowledge about’. It is formal, abstract or theoretical knowledge. For example scientific knowledge, which focuses on the rational ‘understanding’ and ‘knowing’ of universal principles or laws of nature, belongs to this category. This knowledge is mostly based on ‘learning-by-studying’ (Lam, 1998). Also Machlup ((1980) in (Grant R. M., 1996)) identifies ‘intellectual knowledge’, which embraces scientific, humanistic, and cultural knowledge. In contrast, knowledge can also be largely based on practical experiences. Whereas Machlup ((1980) in (Grant R. M., 1996)) identifies ‘practical knowledge’, Blackler (1995) identifies ‘embodied knowledge’, which is action oriented and likely to be only party explicit. This is what Ryle (1949, p. 29) called ‘knowledge how’ and James (1950) refers to as ‘knowledge of acquaintance’. It is practical, individual knowledge created by ‘learning-by-doing’. Embodied knowledge builds upon ‘bodily’ or practical experience (‘doing’), in contrast with embrained knowledge which depends on abstract theoretical reasoning (‘knowing’) (Lam, 1998). In this view, practical skills (e.g. performing a surgery, designing a car or polishing a diamond) could be considered a part of knowledge.

Ryle (1949) argues that it would be quite possible for a boy to learn chess without ever hearing or reading the rules. “By watching the moves made by others and by noticing which of his own moves were conceded and which were rejected, he could pick up the art of playing correctly [...] We learn how by practice, schooled indeed by criticism and example, but often quite unaided by any lessons in the theory.” (Ryle, 1949, p. 29) Thus, practical knowledge does not always require a theoretical background.

Knowledge is active (knowing) This perspective emphasizes the active nature of knowledge. This activeness can be seen in many ways. We continuously learn and apply our knowledge, and our knowledge is constantly evolving. Knowledge is not a static phenomenon. Blackler (1995, p. 1035) even argues that “rather than talking of knowledge, with its connotations of abstraction, progress, permanency and mentalism, it is more helpful to talk about the process of knowing.” Instead of regarding knowledge as something that people have, he suggests that knowing is better regarded as something what they do. Blackler distinguishes knowing as mediated (knowing as a phenomenon that is manifest in systems of language, technology, collaboration and control), situated (knowing as a phenomenon that is located in time and space and specific to particular contexts), provisional (knowing as a phenomenon that is constructed and constantly developing), pragmatic (knowing as a phenomenon that is purposive and object-oriented) and contested (knowing as a phenomenon that is exposed to dynamics of domination and subordination).

Alavi and Leidner (2001, pp. 109-110) describe the ‘knowledge as a process’ perspective as a simultaneous process of knowing and acting where the focus lays on the applying of expertise. However, not only the application of knowledge could be considered a part of knowing, also activities that relate to increasing our knowledge (e.g. abstract theoretical reasoning is refered to as ‘knowing’ by (Lam, 1998)) can be considered a part of knowing. Alavi and Leidner distinguish the perspective of
‘knowledge as a state of mind’, which focuses on enabling individuals to expand their personal knowledge and apply it to the organisation’s needs (Alavi & Leidner, 2001, pp. 109-110). This perspective could be seen as a condition or context for knowing.

Ryle (1949), in comparison to believing, states that “to know is to be equipped to get something right and not to tend to act or react in certain manners.” He claims that ‘know’ is in the same family as skill words; “[..] so we ask how a person knows this, but only why a person believes that, as we ask how a person ties a clove-hitch, but why he wants to tie a clove-hitch or why he always ties granny-knots. Skills have methods, where habits and inclinations have sources.”

Machlup (1980) identifies 13 different ‘elements of knowing’ including: being acquainted with, being familiar with, being aware of, remembering, recollecting, recognizing, distinguishing, understanding, interpreting, being able to explain, being able to demonstrate, being able to talk about, and being able to perform.

| Knowledge as a capability | Within this perspective, knowledge has been seen as a capability with the potential for influencing future action. Watson (1999) builds upon the capability view by suggesting that knowledge is not so much a capability for specific action, but the capacity to use information, that is: learning and experience result in an ability to interpret information and to ascertain what information is necessary in decision making (Alavi & Leidner, 2001, pp. 109-110). Weggeman (2007), similarly, sees knowledge as a personal ability to perform a certain task: an ability that can be viewed in a metaphorical way as the product of the information, the experience, the skills and the attitude that a person possesses at a particular moment in time. |
| Importance of knowledge | Boersma (2002) distinguishes basic knowledge, specific knowledge and crucial knowledge to an organisation. Basic knowledge is available in each organisation and is inherent to running an organisation. It is independent from the organisation type and is mostly not part of the core competences of the organisation. Specific knowledge is related to the specific industry in which the organisation operates and is needed to analyse and solve specific problems. Crucial knowledge consists of that knowledge that gives the organisation a competitive advantage, strongly related to the core competencies of the organisation. The author emphasizes that the more crucial the knowledge is to the organisation, the better managers have to monitor it. This, however, can change over time when for example developments in the market require the organisation to develop new crucial knowledge or to dispose of obsolete knowledge. This makes this classification relative in nature. |
| Other categorizations of knowledge | Besides the already described perspectives on knowledge, even more perspectives have been mentioned in KM literature. For example pastime knowledge (e.g. news, gossip and stories), spiritual knowledge and unwanted knowledge Machlup (1980) in (Grant R. M., 1996). Further, knowledge has been classified based on domains that are useful to organisations (Bertrams, 2003) in (Boer, 2005). These are specialized knowledge (knowledge which is required in order to produce services or products), market |
knowledge (knowledge about current and future markets, including knowledge about competitors and suppliers), client knowledge (about the needs and characteristics of the consumer) and organisation knowledge (knowledge about the mission, objectives, strategy and the division of employees over departments for example).

At last, Wigg ([1993] in [Boer, 2005]) has distinguished eight knowledge detail dimensions from knowledge domain (broad) to knowledge atom (detailed).

### 2.1.5 PHILOSOPHERS’ VIEWS

Most of the modern KM literature is based on more recent sources (e.g. mostly from 1980’s upwards) and limited attention is given to the views from Plato or Descartes for example. Some authors do mention that the epistemological debate dates back to the Greek era (e.g. [Alavi & Leidner, 2001] and [Boer, 2005]), however they often lack further explanation of such philosophers’ views on knowledge. Now follows a short elaboration on some of the concepts of great philosophers based on [Glasbeek, 2014]. They give some additional insights of which some are less represented in modern literature, while others are strongly connected to current topics.

As mentioned before, Plato’s (428/427 or 424/423 – 348/347 BCE) definition of ‘knowledge equals true opinion, accompanied by reason’.

René Descartes (31 March 1596 – 11 February 1650) speaks of ‘innate knowledge’ that is not acquired through our sense organs, but can only be recollected. One could think of instincts for example; a new born infant that immediately has a sucking reflex or that it displays basic language skills such as recognizing certain sound patterns. He further sees ‘ideas’ as a bridge between our inner being and outer world. That is, having knowledge of an external object does not mean that we have literally this object in our brain. Instead, we have an ‘image’, a mental image, of it in our mind.

Immanuel Kant (22 April 1724 – 12 February 1804) describes preconceived judgements (‘a priori knowledge’) (e.g. time, space and cause and effect) as categories of understanding. They act as lenses through which we experience life. They help us swiftly internalise our experiences. Our rational, thinking mind (‘reason’) always works together with our empirical experiences. This combination is important to enrich our abilities, but also limits our knowledge. The knowledge we build, use or capture is inevitably an altered version of the real thing, which can only approximate, and never equate, the thing-in-itself. This is due to our mind and senses which are ever-present and act as filters.

Bertrand Russell (18 May 1872 – 2 February 1970) poses that all knowledge is more or less uncertain and more or less vague. Here, certainty is seen as a degree to which something is truthful. He claims that complete certainty is unattainable and so absolute truths are impossible. Further, certainty and precision can be seen as a sort of opposing forces; by increasing a statement’s precision (lowering vagueness), changes are that aspects become apparent that make it less appealing or truthful to the eye of the beholder. For example think of political quotes. One might think of restricting knowledge to only the highest degrees of both certainty and precision, but as Russell notes, this would neither work in science nor daily life. However, it is important to indicate vagueness and uncertainty where they are present, and, if possible, to estimate their degree. Russell further argues that knowledge is intensely and nearly inextricably linked with our personalities. It internalised and intertwined with our temperament. A view that is still very alive today.

Ludwig Wittgenstein (26 April 1889 – 29 April 1951) sees language abilities as a determining factor of one’s world. How we experience our various worlds is connected to our ability to use language. This implies that expanding our language abilities enables expanding our world, and vice versa, reducing our
language proficiency shrinks our world. This is why it is so important for young children to acquire a large vocabulary. In contrast, when a person goes to another country in which he or she has to speak a foreign language which is hardly possessed, this can make everyday life much harder.

Language abilities (expression dimension from prelinguistic to linguistic) could be linked to a tacit-explicit (volume) dimension and to an unconscious-conscious (awareness) dimension (Glasbeek, 2014). This makes four categories:

1. Unconscious and tacit (silent) knowledge. All unconscious knowledge is not (properly) expressible.
2. Conscious and tacit (silent) knowledge. For example memories which are related to our sense of smell. Also intuition and skills like tying a shoelace. In all of these cases we are unable to precisely articulate the knowledge.
3. Conscious and explicit (pronounced) knowledge which is better expressed symbolically, e.g. with drawings or actual movement (prelinguistic). One could think of showing the way on a map, drawing the shape of a car or pointing to an object with a colour that you referring to.
4. Conscious and explicit (pronounced) knowledge for which verbally expressing works fine. This is probably the easiest knowledge to transfer from one person to another.

All three dimension must be seen as dynamic, as with effort the unspeakable can be said, however imperfectly.

2.1.6 CONCLUSION
In order to answer the question ‘what is knowledge?’ a rather theoretical and thorough approach is taken. As a part of this search the more common subjects (e.g. the distinction between data, information and knowledge, and the distinction between tacit and explicit knowledge) are thoroughly discussed, but also some of the views from great philosophers (i.e. Plato, Descartes, Kant, Russell and Wittgenstein), which seem to get less attention in modern KM literature.

A number of observations can be made from this literature review. First, there is no and probably will not be a consensus on the definition of knowledge. Second, a lot of attention is given to identifying perspectives on and categorisations of knowledge in KM literature. Third, ‘knowledge’ seems to be strongly connected to ‘personal’. This is what makes it different from information, sometimes hard to formulate, and unique for each person.

Answering the question ‘What is knowledge?’:

- Knowledge is a complex notion without a generally accepted definition.
- Knowledge is considered ‘richer’, contextual and more personal than information or data. It is strongly connected to or existing in humans (e.g. Alavi and Leidner; Davenport and Prusak; Tuomi; Russell; Weggeman) and possibly in other forms (e.g. animals, collectives, objects, routines) (e.g. Boersma and Stegwee; Wasko and Faraj). Information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms (Alavi and Leidner).
- Knowledge has been placed on continuums of awareness (e.g. Polanyi; Glasbeek), tacitness (e.g. Polanyi; Nonaka), expressiveness (e.g. Nonaka; Polanyi; Wittgenstein), importance (e.g. Boersma), detail (Wiig), precision and certainty (Russell).
Knowledge is concerned with (personal) belief, truth and justification (e.g. Nonaka; Plato). In contrast to believe, ‘know’ is in the same family as skill words; we ask how a person knows this, but only why a person believes that (Ryle).

Knowledge is seen as a capability with the potential for influencing future action (e.g. to use information) (Alavi and Leidner), a capability to perform a certain task and as time dependent (Weggeman).

Knowledge can be innate (instincts) or based on experiences (e.g. Descartes; Kant). The combination of both reason and sense experiences is important (Kant).

The knowledge of something is (merely) an image or approximation of it in our mind and not the thing-in-itself. We can never be absolutely sure to completely know something, and what we know is influenced by our preconceived judgements (e.g. Kant; Descartes; Russell).

Knowledge has been categorized based on what the knowledge is about, for example to get a complete picture (know-about, -how, -why, -when, -with) (e.g. Alavi and Leidner), useful knowledge categories to organisations (e.g. Bertrams), more practical and/or theoretical knowledge (e.g. Blackler; Ryle; James; Lam), or pastime and spiritual knowledge (e.g. Machlup).

Knowledge is considered active; it is not something we have, but something we do (e.g. Blackler; Alavi and Leidner). We constantly learn and apply knowledge. We should consider knowing instead of knowledge (Blackler).

Knowledge is thus a multifaceted notion. This given characterization must not be seen as a fixed or complete description of the notion knowledge. In practice, it may be useful to have a working definition that encompasses some of the more popular characterizations to quickly indicate (as a tip of the iceberg) what is meant by knowledge. In this view, a similar definition to the ones given by Watson, Weggeman and Rowley could suffice. That is:

*Knowledge is a time dependent combination of information, experience, skills, understanding and attitude that forms a capability with the potential to influence actions.*

The following chapters will go into more detail about knowledge held by collectives, knowledge management and knowledge sharing.

### 2.2 COLLECTIVE KNOWLEDGE, INTELLECTUAL CAPITAL AND TMS

Previous chapter ‘What is knowledge?’ already touched upon the notions of organisational knowledge and collective knowledge. This chapter further examines these notions and focusses on knowledge held by a collective, such as a group, team, department or organisation. When we change the level of analysis from individual to collective, the question rises whether knowledge held by a collective is anything different or ‘more’ than just the sum of the individual knowledge held by the individual members? And if the answer is ‘yes’, how is this possible, how does this work? This section elaborates on these questions and introduces the notions of intellectual capital and transactive memory systems.

#### 2.2.1 COLLECTIVE KNOWLEDGE, ORGANISATIONAL KNOWLEDGE AND INTELLECTUAL CAPITAL

Organisations are run by people. These people have individual knowledge but also form groups, departments, teams et cetera. An organisation with multiple employees therefore contains collectives and can itself, as a whole, also be seen as a collective. One could naturally think about the notion of knowledge in relation to a collective or organisation. According to Nahapiet and Goshal (1998, p. 246) the
question concerns the degree to which it is possible to consider a concept of organisational, collective, or social knowledge that is different from that of individual organisational members. Emphasizing the individual level, Simon (1998) in (Nahapiet & Ghoshal, 1998) states that all organisational learning takes place inside human heads. That is, an organisation learns in two ways: by the learning of its members, or by ingesting new members who have knowledge not previously owned by the organisation. On the other hand, Nelson and Winter (1982) in (Nahapiet & Ghoshal, 1998) assert that the possession of technical knowledge is an attribute of the firm as a whole, as an organised entity. It is not reducible to what any single individual knows, or even to any simple aggregation of the various competencies and capabilities of all the various individuals, equipments and installations of the firm. This second perspective clearly considers the knowledge of an organisation at a higher collective level and poses that this is ‘more’ than the sum of the entities in that collective. One could say that individual and group knowledge are distinct entities (a view held by Cook and Brown in (Boer, 2005)). Nahapiet and Ghoshal further argue that this second perspective is also recognized by Brown and Duguid (1991) in their research on communities of practice, in which shared learning is inextricably located in complex collaborative social practices, and by Weick and Roberts (1993) who demonstrated collective knowing at an organisational level.

To Tsoukas and Validmirov (2001), “knowledge is the individual capability to draw distinctions, within a domain of action, based on an appreciation of context or theory, or both. Organisational knowledge is the capability members of an organisation have developed to draw distinctions in the process of carrying out their work, in particular concrete contexts, by enacting sets of generalizations whose application depends on historically evolved collective understandings.” (Tsoukas & Validmirov, 2001, p. 973) The authors see knowledge mostly as an individual endeavour and argue that “[…] individuals put organisational knowledge into action […]” (Tsoukas & Validmirov, 2001, p. 989), but also recognize the collective understandings as a basis for organisational knowledge.

Wasko & Faraj (2000) recognize the perspective where knowledge is seen as an intangible good that can be shared in communities without losing its value, nor being used up in the transfer processes. This perspective emphasizes the social aspect of knowledge. Knowledge, as a public good, is “a commodity […] that can be provided only if group members contribute something (e.g. money, effort) toward its provision. However, all persons - contributors and noncontributors - may use it” (Komorita & Parks, 1995, p. 192). Wasko and Faraj’s findings suggest that successful communities have members that act out of community interest rather than self-interest. Further, self-interest denigrates the value of the community. When people consider knowledge as a public good, they are motivated to share it with others due to a sense of moral obligation rather than an expectation of return.

In line with these latter views on organisational knowledge, one might start to see this phenomenon more separate from the individuals in this collectively and mostly owned by ‘the organisation’. Boer (2005), however, emphasises that an organisation nor organisational knowledge should be ascribed an independent ‘materialized’ existence. That is, an organisation as such cannot ‘carry’ organisational knowledge. For example, organisational knowing may be embedded in organisational routines, but individual organisation members eventually memorize these routines. Thus, a connection between the collective or organisational knowledge and the individual members should be considered always present.

From a more practical point of view, one could wonder what has been considered a part of the knowledge of a collective or organisation. Alavi and Leidner (2001, p. 118) equate organisational knowledge to organisational memory. Collective or organisational memory is defined as the means by which knowledge from the past, experience, and events influence present organisational activities ((Stein and Zwass 1995, p. 85) in (Alavi & Leidner, 2001)). Organisational memory extends beyond the individual’s memory to
include components such as organisational culture, structure (formal roles), transformations (production processes and work procedures), ecology (physical work setting) and information archives (both internal and external to the organisation) (Walsh and Ungson 1991) in (Alavi & Leidner, 2001). Tan et al (1999) in (Alavi & Leidner, 2001, p. 118) view organisational memory as residing in various component forms such as tacit knowledge acquired by individuals and tacit knowledge acquired by networks of individuals, but also written documentation, structured information stored in electronic databases, codified human knowledge stored in expert systems and documented organisational procedures and processes. Thus, organisational memory or knowledge has been considered to include all sorts of component forms that exist in humans, systems, procedures, roles and even the physical work setting. These component forms also vary in tacitness and whether they are more collective or social (e.g. culture) or more individual. This directly relates to the earlier discussion on ‘what is knowledge?’. Therefore, it may be possible that within a ‘knowledge only exists in human minds’ perspective, the notion of organisational memory does not include information related things such as written documents or databases.

In line with the view of organisational knowledge as ‘more’ than the sum of the individual’s knowledge held by the members, Nahapiet and Ghoshal (1998) use the term intellectual capital that refers to “the knowledge and knowing capability of a social collective, such as an organisation, intellectual community, or professional practice” (Nahapiet & Ghoshal, 1998, p. 245). This definition is chosen to be parallel to the concept of human capital that embraces the acquired knowledge, skills, and capabilities that enable persons to act in new ways. It acknowledges the significance of socially and contextually embedded forms of knowledge and knowing as a source of value differing from the simple aggregation of the knowledge of a set of individuals (Nahapiet & Ghoshal, 1998, p. 246). The authors argue that, for a given firm, the four types of knowledge (elements to Nahapiet and Ghoshal), identified by Spender (1996), collectively form its intellectual capital. These four elements are given below and should not be seen as independent.

- Individual explicit knowledge (“conscious knowledge” to Spender) is usually available to the individual in the forms of facts, concept and frameworks that can be stored and retrieved from memory or personal records.
- Individual tacit knowledge (“automatic knowledge” to Spender) includes theoretical and practical knowledge of people and the performance of different kinds of artistic, athletic or technical skills. Having such people with such tacit skills available is an important part of an organisation’s intellectual capital and can be key to the organisation’s performance. Especially in contexts where individual’s performance is crucial, as in specialist craft work (e.g. watchmaker, diamond cutter).
- Social explicit knowledge (“objectified knowledge” to Spender) represents the shared corpus of knowledge – epitomized, for example, by scientific communities. This kind of knowledge is evaluated for truth testing or according to institutionalized standard which produce a sense of objectification to the scientific community (Spender, 1996). This is often regarded as the most advanced form of knowledge ((Boisot, 1995) in (Nahapiet & Ghoshal, 1998)).
- Social tacit knowledge (“collective knowledge” to Spender) represents the knowledge that is embedded in the forms of social and institutional practice and that resides in the tacit enactment and experiences of the collective (Brown & Duguid, 1991). This kind of knowledge is developed communally, over time, in interactions among individuals in the group (Leonard & Sensiper, 1998). Such knowledge and knowing capacity may remain hidden from individual actors but be accessible and sustained through their interactions ((Spender, 1994) in (Nahapiet & Ghoshal, 1998)). This kind of shared knowledge frequently distinguishes the performance of highly
experienced teams and it appears that much important organisational knowledge may exists in this form (Nelson & Winter, 1982). One could think of the complex, tacit, but heedful interrelation between members of the flight operations team on aircraft carriers (Weick & Roberts, 1993).

Although an organisation’s intellectual company as a whole (all four elements) is important, especially the social or collective knowledge makes intellectual capital ‘more’ than individual knowledge or simply the sum of independent individual’s knowledge. In their research, Nahapiet and Ghoshal therefore focus on social explicit and social tacit knowledge in relation to competitive advantage as “[C]ollective knowledge is the most secure and strategically significant kind of organisational knowledge” ((Conner and Prahal, 1996, p.52) in (Nahapiet & Ghoshal, 1998)). Leonard and Sensiper (1998) argue that collective tacit knowledge (the above fourth category) forms a basis for innovativeness and can help make companies harder to imitate. According to the authors one form of collective tacit knowledge encompasses the entire production system, allowing individuals to contribute to innovation without explicit communication because these individuals understand at a systemic level how all the individual operations in the organisation fit together. The more that tacit knowledge about operations is shared and diffused, the harder to imitate. This is why some companies invite competitors to visit and observe, convinced that no one could imitate their success from absorbing explicit knowledge (Leonard & Sensiper, 1998, p. 122). The authors further argue that perhaps the purest form of collective tacit knowledge is that possessed by a team or group whose process is the product. For example an orchestra or sports team that plays so far beyond the normal that their performance constitutes an act of innovation, using their individual tacit knowledge to serve a shared mental model of perfection. Such groups (including business teams) feel bonds of shared accomplishments. These are inexpressible except in excitement, jubilation, a feeling in triumph in the mutual achievement. Together they have created something that no one of them (or even the group of them, absent this collective tacit knowledge) could have. However, that is nevertheless dependent upon their individual contributions.

Concluding, the discussed notions of collective knowledge, organisational knowledge, organisational memory and intellectual capital mainly vary in whether the subject is considered an organisation or collective in general, and to what extent highly explicit and/or individual knowledge is considered part of the notion. What all these notions however have in common is that they embrace collective tacit knowledge and emphasise the importance of this knowledge. This kind of collective knowledge is important for innovation, hard to imitate by other organisations and can give an organisation a competitive advantage. It is developed communally over time and requires individual contributions by the members. However, the collective knowledge cannot be completely overseen or known by any individual. Sharing and distributing knowledge, communication and relationships are important to develop and sustain collective tacit knowledge.

In this thesis, the notions of collective knowledge and intellectual capital are mainly used. Both are considered to be applicable to collectives in general and organisations specifically. The former embraces at least the notion of collective tacit knowledge and possibly more. Intellectual capital is considered to embrace the four elements proposed by Nahapiet and Leidner. Aspects such as the culture, the roles, the information sources (e.g. database entries, documents, guides et cetera) and the physical environment (workplace) at least influence intellectual capital (and collective knowledge) but could, to some, also be considered part of this notion.
Tsoukas ([1996] in (Boer, 2005)) argues that no single agent can totally specify what kind of practical knowledge will be relevant where and when. The challenge of each organisation is the utilization of knowledge that is not, and cannot, be known by a single agent. Tsoukas, therefore, argues that organisations are distributed knowledge systems in a strong sense. That is, they are decentred systems lacking an overseeing ‘mind’. The distribution of such knowledge or information; who is responsible for what domain of knowledge and how new information or knowledge is allocated, for example, are elements that are described in transactive memory theory.

2.2.2 TRANSGATIONAL MEMORY SYSTEMS

Social knowledge networks (knowledge networks in short) are social networks that explain the pathways by which knowledge is shared between actors. One can speak, for example, about the knowledge network within a group or organisation (all members within the group plus their knowledge sharing connections), knowledge network of one person (actors connected to that person), or the knowledge network adjacent to a group (actors not in the group, connected to at least one member of the group). Different factors determine how these knowledge networks form and evolve. For example, expectations of other actors, limited communication channel, or unawareness of another person and/or his or her knowledge (see also section 2.3.4 about knowledge sharing).

A transactive memory system (TMS) can be seen as a system that explains how knowledge in a team or group functions. It is relevant for understanding group knowledge processes. A TMS is the cooperative division of labour for learning, remembering, and communicating team knowledge (Lewis, 2003). Different types of teams, such as consulting teams, product development teams, research teams and other cross-functional and ad hoc project teams, are purposefully constructed to leverage the specialized expertise of team members. The value of such teams to the organisation depends on whether the team members fully utilize their unique expertise and integrate the differentiated expertise of other members ([Nonaka & Takeuchi, 1995] in (Lewis, 2003)). As it focuses on the utilizing and integrating of distributes knowledge, the TMS construct is an appropriate concept for understanding how knowledge-worker teams can optimize the value of members’ knowledge (Lewis, 2003).

Wegner (1995) observed that members of long-term groups tend to rely on each other to obtain, process and communicate information from different knowledge domains. This system of cognitive interdependence he named TMS. According to transactive memory theory, group members divide the cognitive labour for their tasks and members specialize in different knowledge domains. The individual group members rely on one another to be responsible for specific knowledge such that the group as a collective possess all the information or knowledge they need for their tasks. This mutual reliance gives more room to the individuals to develop more in-depth specialized knowledge while ensuring access to others’ task relevant information. TMS are argued to facilitate fast and coordinated access to deep, specialized knowledge, in order to provide a greater amount of task-relevant expertise to be used for team tasks (Lewis, 2003).

The concept of transactive memory was first introduced to explain the behaviour of couples in close relationships. Transactive memory is memory that is influenced by knowledge about the memory system of another person. What information a person stores, encodes, and retrieves may be different depending in whether that information is already available from another person’s memory. Transactions (communication, interpersonal interactions) influence how well a person can retrieve information from the other person. A person’s explicit or implicit decision to learn and remember new information may be based on such expectations. Transactive memory thus develops as a function that is based on a person’s
beliefs about the knowledge possessed by the other person and also about the accessibility of that knowledge. Transactive memory consists of metaknowledge about what another person knows, together with the knowledge that results from this understanding (Lewis, 2003, p. 588). For example, if a person knows that his or her partner always remembers all birthdays of their family members and informs him or her about upcoming birthdays, then he or she may associate “remembering birthdays” to his or her partner and may never need to learn and remember family birthdays again. This is an example of the person’s transactive memory: what he or she remembers and learns is influenced by what he or she understands of the partner’s memory.

A transactive memory system describes the active use of transactive memory by two or more persons to cooperatively store, retrieve and communicate information. Transactive memory exists in the mind of an individual, a transactive memory system exists between individuals as a function of their transactive memories. To continue the example, suppose that the wife relies on her man to remember where the postage stamps are stored and the man relies on his wife to remember birthdays. When they want to send a card in time for the next family member’s birthday, they use their distinctive transactive memories to retrieve and combine necessary information. That is, they created a TMS. This TMS concept based on dyads is argued to exist in similar form in groups. Group transactive memory is considered to consist of the collection of individual members’ transactive memory (influenced by what other members know) plus member’s understanding of who possesses what knowledge. Group TMS exists when group members actively use their transactive memories to retrieve and combine others’ knowledge to perform a joint task (Lewis, 2003).

**Directory updating, information allocation and retrieval coordination**

Wegner (1995) uses a computer network metaphor to argue that several design factors relevant in linking computers together into networks are also relevant to the ways in which individual human memory systems are linked into group memory systems. These factors include directory updating (learning who knows what in the group), information allocation (assigning memory items to group members), and retrieval coordination (planning how to find items in a way that takes advantage of who knows what). A full group transactive memory occurs when each member keeps current on who knows what, passes information on a topic to the group’s expert on the topic, and develops a relative sense of who is expert on what among all group members.

**Directory updating (getting organized)**

What we know about memories of others are referred to as metamemories (memories about memories). People use different sources of information to create and then update their own transactive memory directories. Wegner (1995) identified the following entries:

- **Default entries.** A directory for an individual could be created based on observation of surface characteristics of the individual. For example, based on stereotypical overgeneralizations, one could think of men to know more about automobile tires than women, or elderly to know more about WWII compared to young people.

- **Negotiated entries.** One of the main purposes for conversations in groups is the updating of individuals’ directories for group information beyond the default level. This can include the assignment of directories to individuals (e.g. a person is assigned to count the number of chairs available), but individuals may also volunteer to be responsible for a range of information. In all
these cases it can be argued that the negotiated entries have been created in the directories of all who hear this allocation.

- **Expertise entries.** Domains of information are also divided based on the perception of group members’ expertise or interest in certain topics. For example, if the group knows that a member has some interest in computers, then maybe all IT related information is directed towards that person. These expertise entries mark one person as having more knowledge or interest in an area than do the others, and this person becomes the group’s designated storage location for items in that area.

- **Access entries.** A directory update can also be based on the knowledge that a person has about the access to information that another person enjoys. Such access entries occur when a person's exposure to information is known to the other. The primacy of access can be a basis. For example, when the first person in the group to hear about the weather forecast is expected to keep track of weather updates later on. Also the duration of access. For example, a person who has lived in a city longer is expected to know the place better. At last, the recency of access can play a role. The person who most recently has used the remote is expected to be able to find it.

Wegner argues that these sources of directory entries are all that are required for the formation of effective directories for each member that provides a map to information in the group (Wegner, 1995, p. 328). Two remarks however. First, when information to be stored in the group becomes fine-grained or poorly organized directory specialists are maybe needed. These persons (e.g. receptionist or operator) keep a far more detailed directory of the areas of knowledge held by group members than the group members have (or need) themselves. The directory specialist has a certain form of power in the group that should be obvious to anyone attempting to access the group’s knowledge. Second, updating of directories can be very complicated. For example, if a couple is together for a long time, both have probably created a stable directory of the others’ memory. Then, directory updates that are intended to enhance group memory must occur a little at a time such that the group memory structure can itself be remembered.

**Information allocation (channelling information to the right places)**

Information allocation is about the allocation of information in a group.

- **Degradation versus efficiency.** The passing of information from one person to the other can be risky. Think for example of the possible degradation of information when it passed along a long chain of people. One might suggest that it is therefore better for the first person to keep the information, but this undermines the formation of group memory. It also has the risk that one person cannot handle so much information. Therefore, often a trade-off is made between degradation risk and group efficiency.

- **Immediate passing on of information.** Information is sometimes passed on immediately and perhaps even without encoding it in one’s personal memory. In that case, the information is only known as a label (e.g. “the cookbook” or “phone bill”) to the passer and he or she will have no contact with the lower-level items of the information (e.g. specific recipes). Such information passing without initial storage of the lower-level information on the part of the passer is especially efficient because it involves passing information without the passer necessarily memorizing the information person ally or subsequently forgetting it personally.

- **Complete transfer of lower-level information.** It is possible that a person holds information in memory and then finds out another person has much more knowledge on this topic. The first
person passes on this knowledge and then forgets about it. For example when a person was responsible for his own research budget calculation in his previous job and now his new department has a budget specialist. He passes on his related knowledge and from that point on does not need this knowledge anymore. Results might be that the budget specialist learns a little from the newcomer, but also that the newcomer soon forgets budget-writing entirely. Thus, transactive memory may cause the effect of creating remembering in some individuals and forgetting in others.

- Progressive differentiation of transactive memory. The eventual effect of these attention/disattention and remembering/forgetting processes is that members of the group become progressive more specialized for memory tasks. This progressive differentiation of transactive memory has an amplifying effect on all types of directory entries. For example sex-role distinctions in memory tasks may become exaggerated in relationships (e.g. he always knows what the latest football scores are, she always knows what the baby should be fed). “We often think of eccentricity as a property of someone who spends too much time alone - but here we find a social process that constructs eccentrics of sorts in service of enhancing the memory of the group to which these people belong” (Wegner, 1995, p. 331).

Some notes on progressive differentiation. In two studies (Liang, Moreland and Argote (in press) in (Wegner, 1995, p. 331); (Moreland, 1994) in (Wegner, 1995, p. 331)) the occurrence and utility of progressive differentiation was observed. Group trained groups, compared to groups were each member was trained individually and separate, performed much better in subsequent group tasks. This underpinned the idea that the development of the group's transactive memory was a key feature in the effect of group training on subsequent performance by the group. Wegner argues that if the typical operation of working groups is characterized by these results, then these results suggest that progressive differentiation is a natural and useful aspect of transactive memory formation. Groups that process information together become proficient as they learn to allocate the information and then retrieve it when they perform. However, progressive differentiation is not always effective. For example complete differentiation would be counterproductive; some knowledge must be shared. Also, when it is not known that a member of the group has certain knowledge, it could be possible that other group members attend for that information themselves possibly outside the group. Differentiation may also be unlikely when the information is of greater interest to individuals than it is to the group. Another exception to the differentiation rule involves information that is not shareable. Not everything can be fully communicated. For example skills, which require (a lot of) time and practice, are usually not as readily transferrable as a specific answer to a question. Implicit memories (without knowing that he or she has acquired these) may not be verbally accessible but only show its presence by influencing performance.

In summary, the information allocation process is the procedure in which individual memories are formed into a differentiated group memory that is useful to the group. The group must have access to the differentiated structure in the directories of its members for the information allocation process to be useful. Wegner argues that only in groups that have been together long enough to form useful directories one can expect that unshared information will be accessed to the benefit of the group as a whole.

Retrieval coordination (strategy for getting information back)

A person in a group has to consider at least two and possibly many more directories (one for each group member) when deciding where to look for any memory item. Retrieval coordination deals with issue of how to organize the search process during retrieval in order to maximize both the speed of the search and
its likelihood of finding the needed information.
A first decision is likely to be whether to search beyond the self at all. Wegner argues that retrieval coordination may invoke, at least initially, an assessment of one’s “feeling of knowing” ([Hart,1967] in (Wegner, 1995)) for the desired information. A question asked to another person can activate the retrieval of the relevant memory item (e.g. the moment you ask a question you come up with the answer) and can also prompt retrieval of an assessment of whether that item is known (e.g. “I cannot know, because...”). Even though some “knowing” judgements may be irrelevant to the likelihood of retrieval, they may influence whether the individual will trust his or her own item retrieval or call on someone instead. Wegner suggests that, besides generating “knowing” judgements about themselves, individuals should also be able to generate these judgements for others in their group based on their directories for those persons (note that this is one of the essential mechanisms to GuruScan’s products; judging another’s knowledge on certain topics). If a person is pretty sure that another person knows, one might even skip to think about it him or herself and immediately ask. This suggests that individuals will often look outside themselves information and sometimes even before they attempt to retrieve items from their own memory. When items are simple or brief retrieval from own memory could be so fast and automatic that looking to others is not even considered. On the other hand, when items are complex or difficult to retrieve from own memory, one may turn to others who seem more likely to know. Wegner argues that when one is trying to retrieve an item and a question like “who would know this?” pops up immediately, one’s own directory surely seems to inspire less confidence then the directory of the other person. Then retrieval attempts will likely be interpersonal rather than intrapersonal.
Several studies observed effects consistent with this proposal (e.g. Smith and Ellsworth, 1987; Loftus, Levidow and Duensing, 1992 in (Wegner, 1995)). An observed phenomenon was that when persons were inaccurate in a particular memory domain that they also tend to be suggestible in that area. Suggestibility can also be influenced by age (e.g. children and elderly) or when the other person is considered as highly knowledgeable on the topic in question, than people are more inclined to change their memory reports. A person may judge their own relative memory abilities different from what is the case in reality. Such misassessments could make them less useful as a member of a transactive memory group. That is, asking for items one already knows or ignoring the retrievals of others when these are more correct than one’s own memory are ways to undermine group memory performance.
Evidence is found that in at least in some cases group memory is generally better than individual memory (Yuker, 1955; Clark & Stephenson, 1989; Hartwick, Sheppard, &Davis, 1982; Hinsz, 1990; Vollrath et al., 1989 in (Wegner, 1995)). When a person feels this way, the decision whether self or others are a better source of memory is likely to be influenced.
Because individuals’ feeling of knowing judgements are not perfectly matched with their actual memory, it could be suggested that group members are not always inclined to dismiss their own (inaccurate) retrievals in favour of others. This means that the improvement from individual to group memory is not complete. Group memory may not include all the accurate information available from the individuals in the group to create a “best possible” retrieval. Research has shown that newly-formed groups indeed do not perform up to this “truth wins” level (Hinsz, 1990; Vollrath, Sheppard, Hinsz and Davis 1989 in (Wegner, 1995)). Therefore, Wegner argues that a key aspect of retrieval coordination is the development of the recognition of expertise among group members. It is found (Libby, Trotman and Zimmer, 1987 in (Wegner, 1995)) that work groups indeed, to some extent, are able to identify members’ expertise. Further, evidence is found that the recognition of a group’s expertise overall is positively related to the group size (Silbinger, 1992 in (Wegner, 1995)).
Another finding (Hinsz, 1990 in Wegner, 1995) shows that group members tend to relate their own memory to the group memory. That is, an individual in a group achieves a feeling of knowing not only for what he or she knows, but also for what other group members know. This may lead to a greater confidence in one’s own memory based on the memories of others, even up to the point where boundaries between one’s own memory and others’ blur and ideas of others are appropriated. Wegner (1995, p. 335) remarks that “these kinds of observations remind us that retrieval coordination is an individual enterprise, something that happens inside the head of each group member, and that therefore can be more or less effective given the individual’s proclivities.” Effects based on egoism, verdicts and social reasons may influence the individual’s efforts at the coordination of directories in a group in a way that the person’s desired or preferred organisation of knowledge in the group may influence the search for information more than the actual organisation of such knowledge. A person may even turn to others for information retrieval while he or she is in a far better position to provide this information. Think, for example, of children who have a tendency to accept memory suggestions from family or their interrogators (Ceci and Bruck, 1993 in Wegner, 1995).

The incursion of memories and suggestions from others into one’s own memory reports seem to be especially likely to occur in the climate of trust in the memories of others that exists when own and others’ memories combine in a transactive memory system.

Evidence for the existence and utility of TMSs and measures related to TMSs
Lewis (2003) describes a number of laboratory and field studies that confirm the existence of TMSs and that they improve team performance. These findings support Wegner’s contention that distributing responsibilities for different knowledge domains increases the amount of relevant information available for team tasks. Further, evidence is found that mutual accountability for knowledge in specific domains encourages members to actively ask information from group member experts. This ensures that more knowledge is shared among members and is brought to be used for team tasks. This was found by group trained members who appeared to use their understanding of member-specific knowledge to access task-relevant knowledge and coordinate processing. Also, groups who developed TMSs were found to complete tasks more accurately than did other groups. This suggests that TMSs do indeed increase group performance. Lewis concludes that “the promising empirical results from laboratory studies suggest that TMSs may explain how teams realize the full potential of members’ collective knowledge.” (Lewis, 2003, p. 588)

Lewis also describes related concepts to TMSs such as team mental models which have been measured in laboratory settings ((Mathieu, Goodwin, Heffner, Salas, & Cannon-Bowers, 2000; Stout, Cannon-Bowers, Salas, & Milanovich, 1999) in (Lewis, 2003)) and field settings ((rwg; Levesque, Wilson, & Wholey, 2001) in (Lewis, 2003)).

These measures, however, are argued to be infeasible for large-scale field studies because the content of TMSs include specific expertise that varies across teams (Lewis, 2003). In most organisations, he argues, tasks differ among teams, making it unlikely that researchers could specify and understand the knowledge domain for each task and team being studied. This would be particularly unpractical for knowledge-worker teams because they are often have a task to develop novel solutions to problems. These measures also limit the ability for researchers to compare TMSs between teams working on different tasks or in different knowledge domains.

Measures used by Levesque and colleagues (2001) and Ensley and Pearce (2001) are more related to a class of tasks (software development projects and strategic decision making) than specific tasks. This allows comparison between a diversity of teams and tasks within a class. They measured agreement from members’ self-reports about their expertise. Lewis argues that TMSs may be measured in a similar way;
by members’ agreement about who knows what. (Note that this is a core concept of the products by GuruScan including the developed Knowledge Network Game). Mental model agreement at least partly define TMSs because a shared understanding about member’s knowledge is necessary to coordinate and integrate expertise during task processing (Lewis, 2003). Such agreement on which members have what expertise only reflects one aspect of TMSs. It does not necessarily imply that members have developed specialized knowledge based on their assessments of others’ expertise or have divided the cognitive labour for their tasks. Thus, members’ agreement about member–expertise associations is related to TMSs, but does not reflect the totality of the construct (Lewis, 2003).

Another concept of expert coordination by Faraj and Sproull (2000) in (Lewis, 2003) is argued to be similar to TMSs. Specifically their measure of expertise location is argued parallel to the idea that TMSs develop from an understanding of what another person knows. Lewis argues that the other dimensions of this concept (whether the team possesses necessary expertise and members’ willingness to bring expertise to bear on tasks) are also likely important to the performance of knowledge worker teams (e.g. software development teams) and are probably correlated to TMSs. Also this measure does not reflect the whole TMS, as it does not reflect whether members have developed specialized knowledge and if they did, whether this is based on an understanding of the content and trustworthiness of the others’ expertise.

Lewis developed a measure of TMSs based on these findings that is appropriate to organisational work teams. The measure is a scale consisting of self-report items (list of questions to be individually scored from 1 to 5) that can be interpreted using basic statistical techniques, which makes it practical for practitioners to administer in their own organisations to diagnose expertise utilisation and integration in teams. Lewis also found evidence for the existence of TMS in organisational teams and found that the TMS construct (concept) can explain how members of effective teams apply what they know.

Thus, evidence is found for the existence of TMS in groups both in laboratory and organisational settings. In addition, evidence is found that suggests that TMSs increase group performance. Further, evidence is found that suggest that group training improves a groups’ TMSs and thereby group performance. And, a method that measures the members’ agreement about member–expertise associations is a measure of a part of that groups’ TMSs, but not the totality of the construct.

2.2.3 CONCLUSION

In this section, several notions and concepts related to collective knowledge, organisational knowledge and intellectual capital are discussed. We can at least argue that collective knowledge of a group or organisation can be ‘more’ than simply the sum the individual members’ knowledge. Collective tacit knowledge that is developed communally over time based on interactions between members is seen as a key factor to why, for example, a sports team, orchestra or flight operations team on aircraft carriers can perform as a unit far above the sum of its parts ( (Weick & Roberts, 1993); (Leonard & Sensiper, 1998)) or what gives innovative companies a competitive advantage (Leonard & Sensiper, 1998). Along with the collective tacit knowledge, the collective explicit, individual tacit and individual explicit knowledge form the intellectual capital of that collective. A transactive memory system (of a group) is the cooperative division of labour for learning, remembering, and communicating group knowledge (Lewis, 2003). Based on mutual reliance, group members develop more in-depth specialized knowledge, which combined increases the amount of relevant information available for team tasks. This can lead to better group performance. Although the examined TMS literature mainly speaks about teams or groups and about information, a similar concept may also be seen in an organisation as a whole, where knowledge domains are divided over departments, for example, and all kinds of knowledge (explicit/tacit,
individual/collective) is continuously ‘allocated’ and ‘retrieved’. In a sense, an organisation thus also develops an organisational TMS. In such cases, methods that help members to find out ‘who knows what’ (e.g. expert finder systems) may enhance the functioning of the organisational TMSs.

2.3 KNOWLEDGE MANAGEMENT

Based on a discourse analysis of KM practitioners’ contributions to an online discussion forum, Crane (2011) found the following topics to arise in a discussion on what the objectives of KM are and what the main role of a knowledge manager is: nature of knowledge, technology, managing knowledge is beneficial, KM is difficult, knowledge sharing, need to motivate, leadership, evangelic nature of KM, culture change, teamwork and evaluation. These topics seem to characterize, to some extent, what is involved with KM both in literature and in practice. Knowledge management is discussed based on these topics.

2.3.1 KM: A BROAD NOTION WITH DEFINITIONAL ISSUES

There is a lack of consensus in KM literature on what knowledge management is; knowledge management “is marked by substantial definitional issues, differences of approach, and controversy, yet it remains a practice of organisations globally” (Crane, 2011, p. 1). By ‘controversy’, the author means “issues in meaning – particularly that of knowledge itself – and the assumptions that people make in understanding the intentions of others” (Crane, 2011, p. 12). The following five examples already show differences in view on what subjects are involved with knowledge management and what purposes knowledge management has. Knowledge management

“[…] is an organisational practice which seeks to leverage knowledge within organisations to guarantee their success” ((Ichijo, 2007) in (Crane, 2011, p. 1)).

“[…] refers to identifying and leveraging the collective knowledge in an organisation to help the organisation compete” ((von Krogh 1998) in (Alavi & Leidner, 2001, p. 113)).

“[…] is purported to increase innovativeness and responsiveness” ((Hackbart 1998) in (Alavi & Leidner, 2001, p. 1)).

“[…] is the process of capturing, developing, sharing, and effectively using organisational knowledge (Davenport, 1994).

“[…] is a multi-disciplined approach to achieving organisational objectives by making best use of knowledge. It involves the design, review and implementation of both social and technological processes to improve the application of knowledge in the collective interest of stakeholders” ((Sandrock 2008) in (Sutton, 2009)).

In addition, WhatisKT (2015) shows over 25 definitions of knowledge management which vary in different aspects. Alavi and Leidner (2001) that KM is mainly regarded as a process involving a minimum of creating, storing/retrieving, transferring and applying knowledge. Crane (2011) argues that the main questions that KM attempts to answer are how organisations can create new knowledge and how they can foster knowledge sharing as embedded practice. Nonaka’s spiral of organisational knowledge creation has been discussed in section 2.1.

In previous chapters is already shown that there are many perspectives on the concept of knowledge itself. Crane, Longbottom and Self (2013) see this lack of a widely accepted and understood definition of
knowledge as a core issue to knowledge management. It is not surprising that, based on these different knowledge perspectives, also different perceptions of knowledge management and knowledge management systems have emerged (Alavi & Leidner, 2001).

Knowledge management systems (KMS) are a class of information systems applied to managing organisational knowledge. A KMS is an information technology (IT) system that is developed to support and enhance the organisational processes of knowledge creation, storage and retrieval, transfer, and application (Alavi & Leidner, 2001). The authors remark that, while not all KM initiatives include an IT implementation, many KM initiatives rely on IT as an enabler. Examples of how IT can support KM include working together and sharing knowledge in virtual teams, information on past projects, learning about customer behaviour and needs by analysing transaction data, and finding an expert or recorded source of knowledge using online directories and databases (Alavi & Leidner, 2001). Because much knowledge in an organisation stays uncodified (e.g. tacit), mapping the internal knowledge is a potentially useful application of KM ((Ruggles, 1998) in (Alavi & Leidner, 2001)). Gazeau (1998 in (Alavi & Leidner, 2001)) found in a survey that around 70% of the respondents believed that their organisations best knowledge was inaccessible and that mistakes were reproduced several times. Such perception of the failure to apply existing knowledge is an incentive for mapping knowledge (Alavi & Leidner, 2001). Note that the GuruScan services and the developed KNG map knowledge.

Alavi and Leidner (2001) give examples of how perspectives on knowledge can have implications for KM and KMS. For example, when one see knowledge as an object to be stored and manipulated, a key KM issue could be the building and managing of knowledge stocks. The role of IT could then involve gathering, storing, and transferring knowledge (e.g. build a database). In contrast, when knowledge is seen as a process of applying expertise, then KM could focus on knowledge flows and the process of creation, sharing and distributing knowledge. The role of IT could then be to provide links among sources of knowledge (e.g. employees) to create a wider breadth and depth of knowledge flows. In practice, different approaches may exist next to each other.

In general, most KM initiatives are found to have one or more of three aims (Davenport & Lawrence, Working Knowledge: How organisations manage what they know, 2000):

- Making knowledge visible and show the role in an organisation. This is often done through maps, yellow pages and hypertext tools.
- Developing a knowledge-intensive culture by encouraging and aggregating behaviours such as proactively seeking knowledge, offering knowledge and sharing knowledge (opposed to hording).
- Building a knowledge infrastructure. Not only a technical system, but a web of connections among people given space, time, tools, and encouragement to interact and collaborate.

In contrast to many IT based KM initiatives which are more suitable for explicit knowledge, examples of KM initiatives that are allow for tacit knowledge sharing include storytelling, mentoring, and communities of practice, among others. Storytelling is a skill use throughout human history to transfer knowledge. It is suitable to transfer tacit knowledge and is exceedingly memorable. A mentor is a person who, officially or unofficially, uses their knowledge and experience to coach, guide and teach a protégé in a one-to-one relationship. They teach a protégé the proverbial ropes of working for the company, imparting the tacit knowledge that is needed to allow the protégé to quickly assimilate to the company culture and ascertain the company’s values. Mentoring can also be based on a peer-to-peer or even a protégé-to-mentor learning experience. Communities of practice (CoP) are topically focussed networks where members of
each CoP are experts for a particular area of interest within the company. CoPs allows members to share experiences in an open environment where creativity is promoted and knowledge sharing encouraged. CoPs often form organically and if management gives support to a CoP and allows integration to the organisation, then the CoP can create a great deal of knowledge, transfer that knowledge amongst its members and ultimately throughout the organisation (Torres-Coronas, 2008, p. 867).

2.3.2 AN OVEREMPHASIS ON INFORMATION TECHNOLOGY AND KNOWLEDGE OBJECTIFICATION

One surprising finding of Crane (2011) is that, among the KM practitioners, knowledge was mostly seen as a taken for granted unproblematic object that can be shared, transferred, stored and sold. This is in contrast with the extensive and ongoing debate over the objectification of knowledge in KM literature. That is, the knowledge as an object perspective (see section 2.1) is one of multiple perspectives on knowledge and not hold by everyone (e.g. Weggeman).

This knowledge objectification, together with technological developments in the domains of internet and Web 2.0 may be seen as a basis for an emphasis on IT in KM ((Prusak & Weiss, 2007; Lee & Lan, 2007) in (Crane, 2011)). Also, this heavy emphasis on technology is argued as mainly a result of KM initiatives being often led by organisations’ IT teams ((Bhatt, 2001) in (Crane, 2011)).

This emphasis on IT at the expense of social and cultural facets of KM has been criticized ((Davenport and Prusak 1998; Malhotra 1999; O’Dell and Grayson 1998) in (Alavi & Leidner, 2001)). According to many authors, knowledge is largely – and wrongly – treated as an object which can be shared, transferred, stored and sold (Crane, 2011). This objectivist perspective is in contrast with, for example, a perspective that emphasises the value of highly tacit knowledge, which is hard or even impossible to articulate. That is, Crane (2011) noticed that more recent researchers and practitioners tended to pursue tacit knowledge as the Holy Grail of KM. One can imagine that a focus on (collective) tacit knowledge, for example, may lead to group training or creating a work environment that stimulates collaboration and conversation instead of developing and implementing a new database system. These two different approaches or strategies (focus on explicit versus tacit knowledge) are also identified by Leidner, Alavi and Keyworth (2006) and Hansen, Nohria and Tierney (1999).

2.3.3 OBJECTIFICATION AND PERSONALISATION STRATEGY

Leidner, Alavi and Keyworth (2006) distinguish a process and a practice approach to KM. Hansen, Nohria and Tierney (1999) make a similar distinction between an objectification and a personalisation strategy. The one emphasises explicit knowledge (objectification strategy or process approach) and the other emphasises tacit knowledge (personalisation strategy or process approach). The terms objectification strategy and personalisation strategy are used.

The objectification strategy is characterised by a person-to-document approach (Hansen, Nohria, & Tierney, 1999). The main idea is to codify knowledge in files, rules, tools and procedures for reuse. Invest once in a knowledge asset, reuse it many times. Also benefit from scalability. This involves a heavy investment in IT to support knowledge codification, storage, dissemination, and allow reuse of knowledge. The goal is to connect people with reusable codified knowledge. For example intranets, data warehousing, knowledge repositories and decision support tools (Leidner, Alavi, & Kayworth, 2006).
Disadvantages of this strategy include the neglecting of tacit knowledge, and possibly the limiting of innovation and forcing participants into fixed patterns of thinking (Leidner, Alavi, & Kayworth, 2006).

The personalisation strategy is characterized by a person-to-person approach. A goal is to develop networks for linking people so that tacit knowledge can be shared (Hansen, Nohria, & Tierney, 1999). For example by personal face-to-face contact, social environments, CoPs and storytelling. This strategy provides an environment to generate and share high value tacit knowledge, and provides a stimulus for fresh ideas and responsiveness to changing environments (Leidner, Alavi, & Kayworth, 2006). This strategy, however, can result in inefficiency and an abundance of ideas with no structure to implement them (Leidner, Alavi, & Kayworth, 2006). It requires a moderate investment in IT to facilitate conversations and the exchange of tacit knowledge.

The following examples show how these two strategies are used within a consulting sector:

Andersen Consulting and Ernst & Young use a codification strategy (Hansen, Nohria, & Tierney, 1999). Their competitive strategy is to provide a high-quality, reliable, and fast information-systems implementation by reusing codified knowledge. They use large teams with a high ratio associates to partners and focus on generating large overall revenues. New college graduates are hired who are well suited to the reuse of knowledge and the implementation of solutions. People are rewarded for using and contributing to documents databases.

Mc Kinsey & Company, Bain & Company and BCD use a personalisation strategy (Hansen, Nohria, & Tierney, 1999). Their competitive strategy is to provide creative, analytically rigorous advice on high-level strategic problems by channelling individual expertise. They charge high fees for highly customized solutions to unique problems, use small teams with a low ratio of associates to partners, and focus on maintaining high profit margins. They hire M.B.A.s who like problem solving and can tolerate ambiguity, train people through one-to-one training, and reward people for directly sharing knowledge with others.

Hansen, Nohria and Tierney argue that companies should pursue one of these two strategies predominantly and use the other to support the first. They see this as knowledge sharing follows about 80% of one strategy and 20% the other. Executives who try to excel at both strategies risk failing both (Hansen, Nohria, & Tierney, 1999). The authors further argue that a company’s KM strategy should reflect its competitive strategy: how it creates value for customers, how that value supports an economic model, and how the company’s people deliver on the value and the economics. Assuming that the competitive strategy is clear, the authors argue that the following three questions should be answered to determine a right predominant strategy: Do you offer standardized or customized products? Do you have a mature or innovative product? Do your people rely on explicit or tacit knowledge to solve problems? When the company offers more standardized and mature products and employees mainly rely on explicit knowledge, then a codification strategy is recommended. On the other hand, companies that offer customized and innovative products and employees mainly rely on tacit knowledge, a personalization strategy is recommended.
2.3.4 KNOWLEDGE SHARING

Whether a primary personalization or codification strategy is chosen, or when we look at almost any description of KM, one thing is clear: knowledge sharing is key to KM. A notion that is used interchangeably is knowledge transfer. The notion ‘transfer’, however, seems to imply that it is a one-way action (e.g. from A to B, not necessary also from B to A). When one sees a document, for example, as (codified) knowledge, then this is clearly possible, but when speaking about knowledge in general (including skills or other tacit knowledge for example), then knowledge sharing is often a two-way interaction where both parties learn. Therefore, the term ‘knowledge sharing’ is preferred for use in general.

Crane (2011) notes that knowledge sharing is common throughout both the discourse of the analysed discussion by KM practitioners and literature. It is treated as fundamental to the accomplishment of KM. One KM practitioner argues that it should be more about the seeking and re-use of knowledge, while the other sees re-use as part of sharing.

The definitional process of knowledge sharing is depend on the conceptualization of knowledge which is problematic in itself (Boer, 2005, p. 28). Boer focusses on task-related knowledge sharing between persons and sees knowledge sharing as a subset of both communication and learning. In this context, knowledge sharing is considered to be “a social relational process through which individuals try to establish a shared understanding about reality and to establish the (potential) ability to transform this understanding into (collaborative) actions which yield performance, by using diverse combinations of signs (e.g. language, gestures, illustrations) and tools (e.g. physical objects, communication technologies, mental models). Knowledge sharing is the communication process that is aimed to enable someone to do something (to solve a problem, to use a machine, to write a book) direct or in future by using a variety of communication means.” (Boer, 2005, p. 39)

Within task-related knowledge sharing, Boer identifies the following knowledge sharing objectives: to enable a particular task execution (e.g. What knowledge does one need for completing a particular task?), to improve particular task performance (e.g. How can one capture knowledge so that other people can re-use this knowledge? Can best practices be formulated?) and to ensure task performance over time (e.g. How can one secure the knowledge of experts leaving the organisation? How can new personnel be trained?).

These are a number of conditions that are argued to influence knowledge sharing:

- Necessity to communicate and share knowledge in an organisation (e.g. (Grant, 1996) (Giddens, 1984) in (Boer, 2005)). “Interpersonal communication is the essence of organisation because it creates structures that then affect what else gets said and done and by whom (…) The structures themselves create additional resources for communication such as hierarchical levels, common tasks, exchangeable commodities, and negotiable dependencies” (Weick in (Boer, 2005)). They see communication as “an essential element in the ongoing organizing process through which social structures are produced, reproduced, and changed” (Giddens, 1984).
- Knowledge of own or others’ (need for) knowledge. Knowledge sharing can initiate when people think that their knowledge can be of interest to others (now or in the future) (push variant) and/or when people are aware of their lack of knowing (now or in the future) and are willing to reduce this shortage (pull variant). Both variants of initiations can be either intended or
unintended and are influenced by the assumptions of the knowledge of the others. Assumptions that do not match with the actual available knowledge will result in ineffective knowledge sharing (Boer, 2005). Assuming that one seeks knowledge (pull), Cross, Parker, Prusak and Borgatti (2001, p. 105) also identify the “knowing what someone else knows (even if we are initially inaccurate and calibrate over time)” as a precursor to seeking a specific person out when faced with a problem or opportunity.

- Accessibility of a person. Knowing what someone else knows is only useful when one can get access to that knowledge in a sufficiently timely fashion. Access is highly dependent on the closeness of the relationship, physical proximity, organisational design and collaborative technology (Cross, Parker, Prusak, & Borgatti, 2001).

- Engagement of another person influences the (expected) knowledge sharing process and therefore also the knowledge seeking process. Engaged people don’t dump information but try to first understand the problem as experienced by the seeker and then shape their knowledge to the problem of subject. These people are helpful in learning processes and think with the knowledge seeker (Cross, Parker, Prusak, & Borgatti, 2001).

- Trust/safety. Cross, Parker, Prusak and Borgatti argue that those relations that are safe are often the most effective in learning processes. When one is able to admit a lack of knowledge or to diverge in a conversation often results in learning and creativity. Trust is based on congruent values, culture and preferences. People are restrained to share knowledge with another when the other is not trusted. This is because they think the other will use it for their own benefit (Boer, 2005). One could also fear to lose face when transferring ‘wrong knowledge’.

- Motivations for sharing knowledge. Past research has yielded a variety of fragmented and sometimes contradictory results. For example, some authors {{(Collins, 1974; Huber, 1991) in (Boer, 2005)}} found that power differences may be beneficial for knowledge sharing, while others found a negative effect {{(Lee, 1997; Wiess, 1999) in (Boer, 2005)}}. Also, some authors have hypnotized or found that rewards can have a positive effect on knowledge sharing {{(Huber, 1991; Osterloh and Frey, 2000; Weiss, 1999) in (Boer, 2005)}}, while others found no such effect {{(Constant, et al., 1996; Gupta and Govindarajan, 2000; Van der Bij et al. 2002) in (Boer, 2005)}}. Further, there are contradicting findings regarding the influence of similarity of functional background {{(Ancona and Gladwell, 1992; Brown and Duguid, 1998; Constant, et al., 1996; Hislop, et al., 2000) in (Boer, 2005)}}.

- Communication channel. For knowledge to be able to be shared a communication channel is needed. This can be face-to-face contact, email, phone call, videos, internet forums et cetera. The actual existence, availability and appropriateness of a communication channel influenced the sharing of knowledge. The media richness can limit or enhance the possibilities to share knowledge. For example, trying to learn how to ride a bike (tacit knowledge) by email is probably not going to work. On the other hand, highly explicit knowledge may be well suited for sharing through less rich media channels. One can distinguish information richness from low to high as follows: numeric documents, impersonal written documents, personal documents such as letters and memos, telephone, face-to-face (Daft & Lengel, 1986, p. 560). Other factors such as a lack of a common language (e.g. spoken, using signs) or unclear messages can limit the knowledge sharing process.

The above factors can influence which actors will eventually share knowledge and the effectiveness of this sharing. Therefore, it is important to identify possible barriers for knowledge sharing and address them accordingly.
2.3.5 INTRINSIC AND EXTRINSIC MOTIVATION

People need to want to share knowledge (e.g. (Boer, 2005); (Osterloh & Frey, 2000); (Crane, 2011)). They need to be motivated (time, recognition, encouragement, reward) and the need to be enabled to share (process, technology, structure) (KM practitioner in (Crane, 2011)). Some KM practitioners argue to be careful with reward programs. These programs can easily be gamed and by rewarding knowledge sharing separate from normal work sends the message that knowledge sharing is not part of real work, what is should be (Crane, 2011).

Motivation can be extrinsic or intrinsic (Osterloh & Frey, 2000). Both influence knowledge sharing. People are extrinsically motivated if they are able to satisfy their needs indirectly, especially through monetary compensation. Money is a goal which provides satisfaction independent of the activity itself. In the light of extrinsic motivation, an ideal incentive system would be strict pay-for-performance. Someone’s motivation is intrinsic if an activity is undertaken one’s immediate need satisfaction. Intrinsic motivation can be directed to a self-defined goal such as climbing a mountain, to the activity’s flow, or to the obligations of personal and social identities. In this view, the ideal incentive system is in the work content itself. This must be satisfactory and fulfilling for the employees (Osterloh & Frey, 2000, p. 539).

Osterloh and Frey (2000, p. 544) argue that “managing motivation, especially balancing intrinsic and extrinsic motivation, is an important and hard-to-imitate competitive advantage. This capability is crucial for all tasks in which goals are difficult to formulate and where it is difficult to attribute task completion to particular employees”. Motivation, however, is not a goal in itself but it should support an organisation’s goal. Managers must therefore compare costs and benefits related to motivating employees intrinsically and extrinsically.

Advantages and disadvantages

There are different advantages and disadvantages of intrinsic motivation in contrast to extrinsic motivation (Osterloh & Frey, 2000). Changing intrinsic motivation is more difficult, and the outcome more uncertain, than relying on extrinsic motivation, or “carrots and sticks” (p. 540). Also, intrinsic motivation can be based on undesirable elements such as envy, vengeance, or the desire to dominate. To temper such negative effects external interventions via carrots and cakes are needed. By making unwanted outcomes of intrinsic motivation on superiors, co-workers and customers costly, they become less attractive. Further, external rewards make extrinsic motivated behaviour easier to calculate than intrinsic motivation.

Despite these disadvantages, intrinsic motivation is superior over extrinsic motivation is specific circumstances. First, intrinsic motivation is essential for tasks where creativity is needed. External motivation, in contrast, tends to produce stereotyped repetition of what already works (Amabile 1996, 1998; Schwartz 1990 in (Osterloh & Frey, 2000)) and, under the pressure sanctions, leads to lower learning levels and the work performed is more superficial than with intrinsically motivated employees ((Deci and Flaste 1995, p. 47) in (Osterloh & Frey, 2000)). Second, intrinsic motivation helps to overcome the ‘multiple task problem’ ((Gibbons 1998, Holmstrom and Milgrom 1991, Prendergast 1999) in (Osterloh & Frey, 2000)). That is, when contracts cannot completely specify all relevant aspects of employee behaviour and its desired outcome. In such cases firms rely considerably on intrinsic motivation ((Auston, 1996) in (Osterloh & Frey, 2000)). Third, intrinsic motivation enables the generation and transfer of tacit knowledge under conditions when external motivation cannot. In these cases, the multiple task problem is combined with the problem of ‘freeriding’ in teams.
**Crowding-out effect**
Intrinsic motivation cannot simply be added to motivation induced by prices (extrinsic incentives). Under some conditions the use of a price system undermines intrinsic motivation. This is called the crowding-out effect (Osterloh & Frey, 2000, p. 538). An example of this effect is the motivation of children to do their homework by using rewards. In the short run it might help, but in the long run the chances are that the children do their homework only when they receive a monetary reward. A spill-over effect often occurs: children don’t do any work unless they are paid. Other empirical found examples of a crowding out effect include:

- The number of hours worked in a company decreased under intense supervision by superiors (Barkema, 1995 in (Osterloh & Frey, 2000)).
- Paying donors for giving blood undermines the intrinsic motivation (Tismuss, 1970; Upton, 1973 in (Osterloh & Frey, 2000)).
- Not-In-My-Back-Yard (NIMBY) syndrome. In a research it was found that initially 50.8 percent of the respondents agreed to a nuclear waste repository built in their commune, but when monetary compensation was offered, this level of acceptance dropped to 24.6% (Frey and Oberholzer-Gee 1997; Frey et al. 1996 in (Osterloh & Frey, 2000)).

Note the absence of a crowding-out effect when there is no intrinsic motivation in the first place. This may be the case for simple jobs. It was found that in such cases a price effect can increase performance. For example, in a large car glass company, the productivity increased by changing payments per hour to payments per unit (Laar, 1999 in (Osterloh & Frey, 2000)).

**Organisational forms**
Osterloh and Frey (2000) identify four types of organisational forms which can best enable the transfer of explicit or tacit knowledge with respect to the required extrinsic or intrinsic motivation (see Table 3).

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Knowledge Generation and Transfer</th>
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<tbody>
<tr>
<td>Tacit</td>
<td>Explicit</td>
</tr>
<tr>
<td>Intrinsic</td>
<td>2. Knowledge-based production teams</td>
</tr>
<tr>
<td>Extrinsic</td>
<td>4. Independent knowledge workers</td>
</tr>
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</table>

Cell 1 is based on the idea of extrinsically motivated competition between decentralized units. That is, to run the firm as if it were are a set of markets. Contracts and transfer prices are used instead of commands. When the required knowledge to be shared between the units is encapsulated or otherwise explicit, it might work. However, this idea hinders the flow of tacit knowledge to where it is needed. An organisation should therefore not outsource or separate critical parts of the value chain into different profit centres.

Cell 2 considers the case of knowledge-based production teams. The exchange of tacit knowledge is concentrated within the team and tacit knowledge remains tacit. Socialization (Nonaka, 1994) is the
dominant mode in this cell. Such processes are mostly based on learning by doing. Examples are the construction of complex facilities or the development of a remarkable product design. The tacit knowledge is here embodied in the product or in organisation specific routines that lead to the product. Due to the tacitness of this knowledge it cannot be made explicit nor can it be encapsulated in expert-system software. When this tacit knowledge has led to activities that form a basis for a long-run competitive advantage, this tacit knowledge or these activities are better not dissected into profit centers or outsourced.

There are reasons for the containing of tacit knowledge at the team and individual level. At the team level, competition between firms or profit centers obstruct the sharing of tacit knowledge. As long as members of a unit are compensated according to the unit’s performance, the individual members have no incentive to give up their individual competitive knowledge advantage to others outside the team. Even a complete contract cannot assure the transfer of tacit knowledge ((Madhok, 1997) in (Osterloh & Frey, 2000)). At an individual level, employees cannot be identified and sanctioned if they hold back their tacit knowledge. Peer pressure does not prevent free riding at individual level. When tacit knowledge has to merge within the team, preventing shirking is impossible. The authors give the example of them jointly writing their paper; each author is unable to determine the share of one’s contribution to the joint output. They argue that “in the absence of intrinsic motivation, free riding will take place”.

Cell 3 concerns those cases where part of tacit knowledge are made explicit. Externalization (Nonaka, 1994) is the dominant mode. This takes place as part of a creating firm specific routines in ‘knowledge producing teams’. Examples are quality circles or task forces, such as in the car industry. Members contribute their mostly tacit knowledge about production processes by using narratives for example.

In both Cell 2 and 3 the knowledge transfer itself cannot be observed or measured, but its outcome can. This outcome can, however, not be attributed to a single member. Therefore, the sharing of tacit knowledge within knowledge-based production teams and the conversion from tacit to explicit knowledge requires intrinsically motivated group members committing to the group (Osterloh & Frey, 2000).

Cell 4 incorporates the category of independent knowledge workers in a firm. These employees do not work in a team with cospecialized workers whom they share tacit knowledge with. For example lawyers or experts in computing or finance. They apply their specific tacit knowledge. This application itself cannot be measured, but its output can. This output can, in contrast to cell 3 and 4, be attributed to the independent knowledge worker and he or she can be compensated according to the output’s value to the organisation. Therefore, no intrinsic motivation is needed. On the downside, other companies can easily woo such employees away and benefit from their tacit knowledge (Leonard & Sensiper, 1998). Therefore, the performance of such independent knowledge workers does not contribute to a sustainable competitive advantage.

**Achieve intrinsic motivation**

It is argued that intrinsic motivation is important, especially in knowledge-based production teams. Intrinsic motivation can be achieved in the following ways (Osterloh & Frey, 2000, p. 545):

- Personal relationships and participation foster employees’ intrinsic motivation because their perceived self-determination is raised and psychological contracts are made. This leads to ‘team spirit’.
- By not using individual variable pay-for-performance in groups, a crowding-out effect and potential competition can be avoided.
• Select intrinsically motivated persons for the tasks at hand. Intrinsic motivation is voluntary by nature.

Conclusion

Both extrinsic and intrinsic motivation can be useful in organisations. When it comes to team efforts which are mostly based on tacit knowledge sharing and where the output cannot be attributed to individual members (cell 2 and 3), intrinsic motivation is very important. Extrinsic motivation may be applicable for individual knowledge workers (cell 4) or when the necessary knowledge to be shared between units is explicit (cell 1).

2.3.6 ORGANISATIONAL CULTURE

Organisational culture is argued to be an important factor for knowledge management success (e.g. (Crane, 2011); (Leidner, Alavi, & Kayworth, 2006)). Leidner, Alavi and Kayworth (2006, p. 19) describe organisational culture as a set of implicit assumptions held by members of a group that determines how the group behaves and responds to its environment ((Schein, 1985) in (Leidner, Alavi, & Kayworth, 2006)).

Culture consists, at a deepest level, of values and beliefs that are embedded preferences about what the organisation should aim for and how to accomplish that ((DeLong & Fahey, 2000) in (Leidner, Alavi, & Kayworth, 2006)). These tacit beliefs and values determine the more observable norms and practices such as rules, expectations, routines, rituals, symbols, stories and myths, power structures, organisational structures and control systems ((Bloor & Dawson, 1994; Johnson, 1992) in (Leidner, Alavi, & Kayworth, 2006)). These norms and practices form a social context through which people communicate and act; it drives subsequent behaviours ((DeLong & Fahey, 2000) in (Leidner, Alavi, & Kayworth, 2006)). Figure 7 shows these conceptual levels in relation to knowledge management behaviours: “organisational culture determines the social context (consisting of norms and practices) that determines who is expected to control what knowledge, as well as who must share it, and who can hoard it” (Leidner, Alavi, & Kayworth, 2006, p. 20). The social context (Figure 7, middle level) works as a medium for transmission of underlying values and beliefs (top level) into specific knowledge management behaviours (bottom level).

Figure 7. The impact of organisational culture on knowledge management behaviours. Adapted from (Leidner, Alavi, & Kayworth, 2006, p. 21).
Based on two case studies that gathered the perspectives of individuals in two firms that share some cultural similarities yet differ in other aspects, Leidner, Alavi and Kayworth (2006) offer insight into the role that organisational culture plays in the inception and maturation of knowledge management. They use two distinctions to base their finding on: bureaucratic versus innovative culture perspective, and individualistic versus cooperative culture perspective.

Wallach (1983) (in (Leidner, Alavi, & Kayworth, 2006, p. 21)) conceptualizes organisational culture as a combination of three distinctive cultural types: bureaucratic, innovative and supportive. A bureaucratic culture is characterized by clear lines of authority and work is highly regulated and systematized. An innovative culture is characterized as a creative and risk-taking environment where stress, burnouts and pressure are commonplace. Supportive cultures, in contrast, are those that provide a friendly and warm environment where workers tend to be open, fair and honest. Any given firm is argued to include all three types of cultures, each varying in level of degree.

In addition to linking their findings to bureaucratic and innovative cultures, they also used Earley’s (1994) (in (Leidner, Alavi, & Kayworth, 2006)) distinction of a more individualistic versus cooperative culture. An organisation that encourages individuals to pursue individuals’ goals and rewards performance based on individual achievements is considered to have an individualistic cultural perspective. An organisation that prioritizes collective goals and collective contributions, and rewards collective organisational accomplishments is considered to have a cooperative cultural perspective ((Chatman & Barsade, 1995; Earley, 1994) in (Leidner, Alavi, & Kayworth, 2006)).

Leidner, Alavi and Kayworth’s (2006) findings are summarized in Table 4 and suggest that “organizational culture influences the KM approach initially chosen by an organization, the evolution of the KM approach, and the migration of knowledge. Moreover, the findings suggest that KM eventually can become an integral aspect of the organizational culture” (Leidner, Alavi, & Kayworth, 2006, p. 38).

<table>
<thead>
<tr>
<th>Table 4. Summary of organisational culture’s influence on knowledge management. Based on (Leidner, Alavi, &amp; Kayworth, 2006, p. 37).</th>
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<td><strong>Cultural Perspective</strong></td>
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</table>
| Bureaucratic (Wallach, 1983) | - Favours an initial objectification KM strategy (discussed in section 2.3.3).  
- Creates expectation among members that senior management vision is essential to effective KM. |
| Innovative | - Enables subgroups in organizations to experiment with KM and develop KMs useful to their group. |
| Individualistic | - Inhibits sharing, ownership, and reuse of knowledge. |
| Cooperative | - Enables the evolution of an objectification KM approach to a personalisation KM approach.  
- Enables the creation of virtual communities. |
2.3.7 KM IS IMPORTANT AND BENEFICIAL YET CHALLENGING

Information, knowledge and KM are seen as important factors for the competitive advantage of an organisation (e.g. (Boersma J., 2002); (Berg & Snyman, 2003); (Osterloh & Frey, 2000); (Leidner, Alavi, & Kayworth, 2006)). Management should acknowledge that information and knowledge are important resources and assets to the success of the organisation. Knowledge management should be something eagerly accepted by leaders and incredibly easy to sell (Berg & Snyman, 2003). This, however, is not always the case.

A goal of knowledge management is to provide benefits such as making better informed decisions, fewer errors, less reinventing of wheels, increased innovation and responsiveness, improved products, services and profitability. However, some benefits are also seen as complicated, which tends to be linked to the intangible or invisible nature of the benefit (Crane, 2011). For example an employee who learned to keep a better overview of all relevant factors in his or her job and thereby is able to make better decisions.

Swap, Leonard, Shields and Abrams (2001) argue that KM is challenging because intangible assets related to tacit knowledge accumulate in the organisation through dynamic, unstructured, and often subtle processes that are not easily codified into formal training programs or captured in information systems. These intangible factors make it harder for people who expect concrete and tangible results from initiatives to see the value and potential of KM. People might need convincing and to have trust in KM.

Indeed, KM practitioners emphasise the importance of leadership in KM and the evangelistic nature of KM (Crane, 2011). “The knowledge manager’s role is scripted as a guru, and knowledge ambassadors need to be appointed” (Crane, 2011).

Hansen, Nohria and Tierney (1999) advise organisations to acknowledge, embrace and take leadership in knowledge management and not to isolate it. Organisations in which KM is not high on management’s agenda and KM takes place – if at all – in functional departments such as HR and IT, risk losing its benefits.

These benefits are highest when KM is coordinated with HR, IT, and competitive strategy. That coordination requires the leadership of the general manager. “When CEOs and general managers actively choose a knowledge management approach – one that supports a clear competitive strategy – both the company and its customers benefit. When top people fail to make such a choice, both suffer” (Hansen, Nohria, & Tierney, 1999, p. 116).

2.3.8 EVALUATION AND MEASUREMENT

Evaluation of business processes is based on the systematic collection of information about business processes, initiatives, products, projects, personnel and programs. It allows for understanding how things could be done as seen from a novel perspective compared to the existing way of doing things. It helps in revealing problems and bottlenecks, reduce uncertainties, to clarify options, and provide information about programs, policies and processes within contextual boundaries of time, place values and politics ((Quinn, 1990) in (Eriksson & Dickson, 2003)). Sherwood-Smith (1994 in (Eriksson & Dickson, 2003)) argue that evaluation supports informed decision making which is necessary in every stage of any business process. Evaluation also enables knowledge construction and capacity building ((Segone, 1998) in (Eriksson & Dickson, 2003)). According to Segone, lessons are transformed into knowledge when they are analysed, spread and internalised within and organisation through evaluative processes. Therefore, evaluation can be used in business processes as a tool to gather information, systemise the lessons learned and then disseminate this information to support similar project, process or change initiatives in the future ((Vakola, 2000) in (Eriksson & Dickson, 2003)). Boyd and Robson (1996 in (Eriksson & Dickson,
even argue that “Evaluation and dissemination of lessons learned is crucial in every business sector”.

Supporting employees to systematically evaluate their projects, describe lessons learned in files and make these easy accessibly to the entire organisation can be seen as a valuable KM imitative. However, a KM initiative should not only support evaluation processes, but should itself also be evaluated. “Unless evaluation is done there is no way to gauge the direction in which the KM initiative is heading” (Eriksson & Dickson, 2003, p. 55). Measurement is argued to be crucial to making the value of knowledge accessible to managers and others who need to justify expenditures in a concrete way (Eriksson & Dickson, 2003). This is one of the challenges of KM; on the one hand concrete measurements and results are required for managers, on the other hand some KM initiatives are difficult to measure. Especially when these are purposed to support tacit knowledge sharing, such as CoPs or storytelling. Using strict measures may even demotivate intrinsically motivated people. For example in a group who works together to come up with new innovative ideas and concepts. If one would measure (and maybe require a minimum) of new ideas each week, then the group would possibly generate more simple and less innovative ideas in order to meet these criteria. This may not be the effect imagined. Measuring knowledge and KM initiatives is thus not without its challenges, however, in practice some concrete results are often required to justify the investments.

The following instrument for measuring the success of KM projects developed by Eriksson and Dickson (2003) is not purposed to measure concrete results and outcomes of a KM initiative; rather it is to measure the status of an existing or about to begin KM initiative. Based on the findings organisations can focus on problem areas and pursue further investigation to find more suitable approaches. The authors pose that certain principles are the same for many approaches for evaluating the effectiveness of a KM initiative. For example, the primary objective is to determine if a KM initiative makes a noticeable difference in the dependent variables, and second, the magnitude of the effect. The instrument is a questionnaire to be distributed internally within the organisation during the planning phase or during the conducting a KM project. Main factors associated with KM project practice are included in the instrument and cover organisational environment, technical and managerial support, existence of strategy and goals for KM projects, utilisation of knowledge and technology. The authors suggest to use a type of scale to answer the question and find strong and weak areas. Table 5 shows a selection of proposed example questions related to these factors. Each organisation must identify what is relevant for them and add and delete questions as well as reformulate them to fit their purposes and context (Eriksson & Dickson, 2003).
Table 5. Selection of questions of the KM initiative measurement instrument developed by Eriksson and Dickson (2003).

<table>
<thead>
<tr>
<th>Factors</th>
<th>Example questions (use a type of scale to answer)</th>
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<tbody>
<tr>
<td>Social aspects</td>
<td>Informal networks across the organisation are encouraged.</td>
</tr>
<tr>
<td>Culture</td>
<td>Failure is not stigmatised, rather it is seen as an opportunity to learn.</td>
</tr>
<tr>
<td>Incentives</td>
<td>Good KM behaviour (e.g. sharing, reusing etc.) is actively promoted on a day-to-day basis.</td>
</tr>
<tr>
<td>Trust issues</td>
<td>People are engaged in decisions that directly affect them.</td>
</tr>
<tr>
<td>Organisational structure</td>
<td>A flexible, well-structured, up-to-date knowledge map exists to point staff in the direction of the knowledge they seek.</td>
</tr>
<tr>
<td>Awareness and commitment</td>
<td>Senior management demonstrates commitment and action with respect to KM policy, guidelines and activities.</td>
</tr>
<tr>
<td>Strategy and goals</td>
<td>There are defined responsibilities and a budget set for KM initiatives.</td>
</tr>
<tr>
<td>Information Technology</td>
<td>Technology is a key enabler in ensuring that the right information is available to the right people at the right time.</td>
</tr>
<tr>
<td>Maintenance and Protection</td>
<td>Effective cataloguing and archiving procedures are in place for document management, whether held electronically or not.</td>
</tr>
<tr>
<td>Using and Applying Knowledge</td>
<td>Ideas to exploit pools of information are reviewed and acted on for potential business benefit.</td>
</tr>
</tbody>
</table>

The measurement instrument developed by Eriksson and Dickson (2003) is “intended to be a starting point and it is up to each individual company to modify the instrument to fit their business goals” (p. 61). Indeed, the broad selection of integrated factors related to KM allow it to be a template for one’s customized version and be used as a checklist to make sure no important factors are overlooked. A disadvantage is the lack of a concrete example in practice of how this instrument is actually adapted and used. The authors suggest that research could be done on the success/failure factors of KM initiatives and on developing a dynamic KM model to be used by different organisations.

2.3.9 CONCLUSION

KM is a broad field that includes a wide range of topics and initiatives of which a selection is discussed. There is a lack of consensus on a KM definition. KM is mainly regarded as a process involving a minimum of creating, storing/retrieving, transferring and applying knowledge (Alavi & Leidner, 2001). KM is an important factor for a competitive advantage (e.g. (Boersma J., 2002); (Berg & Snyman, 2003); (Osterloh & Frey, 2000); (Leidner, Alavi, & Kayworth, 2006)). Most KM initiatives have one or more of three goals, namely making knowledge visible and show the role in an organisation, develop a knowledge intensive culture, and building a knowledge structure (Davenport & Lawrence, 2000). Examples of KM initiatives are TMSs, CoPs, storytelling and mentoring. Because much knowledge in an organisation stays uncodified (e.g. tacit), mapping the internal knowledge is a potentially useful application of KM (Ruggles, 1998) in (Alavi & Leidner, 2001). This is where GuruScan helps; mapping who knows what.

An often found emphasis on IT at the expense of social and cultural facets of KM has been criticized
More recent researchers and practitioners tended to pursue tacit knowledge as the Holy Grail of KM (Crane, 2011). These two emphases are reflected by the objectification KM strategy and personalisation KM strategy. Hansen, Nohria and Tierney (1999) argue that companies should pursue one of these two strategies predominantly and use the other to support the first. The authors further argue that a company’s KM strategy should reflect its competitive strategy.

Knowledge sharing is influenced by factors such as the necessity to communicate and share knowledge, the knowledge of own or others’ (need for) knowledge, the accessibility of a person, trust and safety, the motivations for sharing knowledge, and the used communication channel. Motivations can be intrinsic or extrinsic, and are both useful in organisations (Osterloh & Frey, 2000). Intrinsic motivation is specifically important for team efforts which are mostly based on tacit knowledge sharing and where the output cannot be attributed to individual members, intrinsic motivation is very important. Extrinsic motivation may be applicable for individual knowledge workers or when the necessary knowledge to be shared between units is explicit.

Organizational culture influences the KM strategy initially chosen by an organization (i.e. more objectification or more personalisation), the evolution of the KM approach, and the migration of knowledge. Moreover, findings suggest that KM eventually can become an integral aspect of the organizational culture (Leidner, Alavi, & Kayworth, 2006, p. 38).

KM is also seen as challenging; people need to be convinced, knowledge managers need to act as ‘gurus’, and KM should be something eagerly accepted by leaders and incredibly easy to sell, but that is not always the case (Berg & Snyman, 2003). Concrete results and measurability of KM initiatives may help to get support from management or may even be required to justify expenses (Eriksson & Dickson, 2003). However, not everything is as easily measureable and measurements may even demotivate intrinsically motivated persons. An instrument developed by Eriksson and Dickson (2003) may be used in the planning and execution phase to monitor and measure the success of a KM initiative and adjust accordingly.

KM is a broad field that includes a large range of topics and initiatives of which a selection is discussed. The interviews give more insight in how KM is conducted in practice. See next chapter and the conclusions.
3. INTERVIEWS: HOW DO ORGANISATIONS VIEW AND VALUE KNOWLEDGE, KNOWLEDGE NETWORKS AND KNOWLEDGE MANAGEMENT?

This chapter gives a practical perspective on the main question:

*How do organisations view and value knowledge, knowledge networks and knowledge management?*

An explorative approach is taken: four persons from four different organisations have been interviewed. Among other things, the interviewees differ in being a knowledge manager or not, and the organisations differ in being public or commercial, and in size. This varied selection gives a broad indication of issues arising, but does not allow for generalisations. However, the findings can function as a basis for future research.

Section 3.1 introduces topics discussed in the interviews that emerged during the conducting of the literature review (chapter 2). This section also includes an overview of the interviewees and organisations. Sections 3.2 to 3.4 describe the interviews.

3.1 INTRODUCTION TO THE INTERVIEWS

The following topics are used as a basis for interviews to ultimately answer the main question.

**Most important KM initiatives.** All topics in chapter 2 may be considered a part of, or at least connected to, KM. This already shows the breadth of the KM concept. Other topics, such as the technical development, implementation and maintenance of a KMS, or the creating of a safe, creative and energetic atmosphere, may also be considered a part of, or at least exert an influence on, KM. This leads to the question of what organisations, in practice, consider KM? What do they see as their most important KM initiatives?

**Goal of KM/Successful KM initiatives.** The measurement or evaluation of knowledge and KM initiatives is argued by some to be difficult, impossible and even counterproductive. This depends on what is considered the goal or outcome of KM. What do organisations see as the most important goals or outcomes of KM? And when is KM seen as successful by the organisation (or when not)?

**Classification of knowledge based on importance.** There seems to be a consensus among KM practitioners and KM literature that knowledge and KM is important and beneficial for an organisation and especially for the establishing and maintaining competitive advantage. Not all knowledge is argued to be of the same importance to an organisation. Do organisations (implicitly or explicitly) categorise knowledge based on importance? What is then considered highly important/crucial/critical knowledge? And who decides what is crucial knowledge and how is this determined?

**Availability of crucial knowledge.** Two of the most prevailing subjects of KM are the sharing and storage/retrieval of knowledge. One could argue that this is especially important for what is considered crucial knowledge. How is this crucial knowledge available to the organisation?

**Insight in social knowledge networks.** KM is about making the best use of knowledge for the benefits of the organisation. This includes explicit knowledge but definitely also tacit knowledge that is held by people. As argued in the discussions of TMSs and knowledge sharing, one of the important factors is knowing ‘who knows what?’. To what extent do have organisations general insights in ‘who knows what’,
both inside and outside the organisation?
In addition, do they also have an insight in who shares which knowledge with whom? That is, insight in the social knowledge network. And how do they use such insights?

**Crucial knowledge retention.** More specifically, situations where crucial knowledge is available only to a limited extent may contribute to a potential knowledge loss, for example if only one or a few employees hold crucial tacit knowledge. The disappearance of such important persons, for example due to sickness of retirement, can cause knowledge loss. How do organisations deal with such situations? Specifically when the crucial knowledge is tacit and the sharing or transferring of this knowledge may take a decent amount of time and effort.

Table 6 shows an overview of the interviewees and related organisations. Some organisations and interviewees are anonymised based on their request. Appendix B includes KM initiatives and activities mentioned by the interviewees. Appendix C includes findings from interviews compared with KM literature.

<table>
<thead>
<tr>
<th>Used name</th>
<th>Summary</th>
<th>Public/commercial</th>
<th>Interviewee (function)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation 1</td>
<td>Dutch province. About 1500 employees.</td>
<td>Public organisation</td>
<td>Person A (Knowledge manager for over 2 years)</td>
</tr>
<tr>
<td>Organisation 2</td>
<td>International hard- and software company. More than 120,000 employees in 145 countries.</td>
<td>Commercial organisation</td>
<td>Person B (Former knowledge manager for 16 years)</td>
</tr>
<tr>
<td>Organisation 3</td>
<td>Dutch financial institution. About 6500 employees.</td>
<td>Commercial organisation</td>
<td>Person C (Manager (Non-knowledge manager) for over 1 year).</td>
</tr>
<tr>
<td>Koninklijke Visio</td>
<td>Dutch centre of expertise in the field of partially sighted/blindness with over 3000 employees in various locations.</td>
<td>Public organisation</td>
<td>R. Koman (Knowledge manager for over 2 years)</td>
</tr>
</tbody>
</table>

**3.2 INTERVIEW 1: ORGANISATION 1 (PERSON A)**

Person A is an Advisor Knowledge and Research at the Province for over two years. His function includes trend watching, knowledge management, coordination of new and social media, and organising events. In his previous jobs he also attained a role as advisor and project manager, but not as a knowledge manager.

Organisation 1 is a Dutch province (district unit of government) employing about 1500 people. The organisational structure is based on six substantive clusters (i.e. Space, Nature and Environment, Mobility and Infrastructure, Economy and Internationalising, Culture and Society, and Projects and Real estate) and three supportive clusters (Operational Management, Information and IT, and Service and Relation management). ‘Team Knowledge and Research’ has an advising and steering role at a higher strategic and
policy level. The subjects of knowledge and research are thus combined. Person A is one of seven people that form Team Knowledge and Research.

**Interview**

Organisation 1 has strategic and social tasks (see Table 7, columns 1 and 2). Within these areas, Organisation 1 collaborates with universities and academies. These collaborations are divided in three strategic guidelines (see Table 7, column 3).

<table>
<thead>
<tr>
<th>Strategic tasks</th>
<th>Social tasks</th>
<th>Strategic guidelines (used to classify projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong urban network</td>
<td>Smart mobility</td>
<td>Province as a knowledge enquirer (incidental, purposed to answer questions posted by Province and financed as a task)</td>
</tr>
<tr>
<td>Vital countryside</td>
<td>Sustainable energy</td>
<td>Province as a stimulant for knowledge about and for the province (structural, financed by subsidy or as a collaboration project)</td>
</tr>
<tr>
<td>Economic innovation</td>
<td>Sustainable agro and food</td>
<td></td>
</tr>
<tr>
<td>Cultural identity</td>
<td>Healthy aging</td>
<td></td>
</tr>
<tr>
<td>Effective collaboration</td>
<td></td>
<td>Province as a facilitator of connections between education and business, targeted to towards a futureproof labour market and economy.</td>
</tr>
<tr>
<td>Internationalisation and branding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resilient administration</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Person A notes that States-Provincial (Provinciale Staten in Dutch) executed a voting round to prioritise responsibilities and activities for Organisation 1. As far as he knows, this has been done once, a few years back. It is not something that happens regularly. At that time a subject as ‘Nature and Environment’ was popular (one of the clusters). Nowadays there is an ongoing shift in process of less thinking in clusters and more thinking transcending clusters in subjects such as ‘Healthy aging’. However, this is still much to improve. Person A further argues that, in the end, politics and management determine what subjects are seen as most important. This can be tough when one has put a lot of effort in a subject that was considered highly important for a couple of years, and then, with a change of States-Provincial, other subjects are prioritized.

Team Knowledge and Research keeps States-Provincial informed on running and planned research projects within Organisation 1 and is responsible for the development and progress of the Research and Advisory agenda. This agenda describes knowledge topics related to the strategic and social tasks as described above, plus the related running and planned strategic studies.

A successful initiative, according to Person A, is the research database of Organisation 1. It is already in good use, but could benefit from even more exposure. The research database is a collection of mostly strategic studies from both internal and external parties (e.g. research institutions and consultancy
bureaus). Team Knowledge and Research does not only add strategic studies to this database, but also manages and starts them in some cases. These strategic studies are primarily signalling (e.g. future trends), policy making (e.g. research suitable monitoring tools), and evaluative (e.g. policy evaluations). Studies about carrying out projects are initially not added by Team Knowledge and Research, but whenever someone would like to add a research in this area, it will be done. Using a questionnaire, users can also evaluate consultancy bureaus for example. In the past, situations have occurred that one department just had bad experiences with an external party, and within a short time another department already collaborated with them again, not aware of the past problems.

Organisation 1 recently had to downsize, what meant an outflow of employees. Another downsizing round may be necessary in the near future, what means more outflow of people and more knowledge loss, argues Person A. Team Knowledge and Research helps the organisation with determining what knowledge is wanted after such downsizing and who has this knowledge (multiple GuruScan Team Accelerator sessions are planned to help with that). Person A describes a current change in direction of Organisation 1, of going from a knowledge institution that want to have all knowledge in-house towards wanting to have less knowledge in-house, but knowing where to find it.

In collaboration with a colleague, Person A developed a creative workshop and knowledge mapping model. This model is based on four steps. First, a group must determine what knowledge is wanted and which of that knowledge is available or not. Second, when some of the wanted knowledge is not available, the group determines where this knowledge could be gained from. Third, when some of the wanted knowledge is available, the group determines how and with whom this knowledge will be shared. Fourth, actions are defined based on step two and three. The total duration of the workshop is about 3 hours and includes mind mapping.

Another initiative what Person A organises, are knowledge cafés. Within Organisation 1, a knowledge café is a voluntary gathering of people in which questions from inside the organisation are answered by the group. These questions may origin from a person or a department for example. The knowledge cafés are usually held during worktime and attract about 30 to 40 people each time. The initiative for a knowledge café is started from the workplace and now picked up and supported by management. Person A argues that the sessions run well and participants are intrinsically motivated. A knowledge café is seen as a success whenever the person or group who posted the question can move forward after the session.

Organisation 1 uses different IT systems. First, there is a document information system (Corsa). Second, a system from SAP, which only a few people really understand according to Person A. It is used frequently, but only by a small selection. Third, an intranet system that is mostly used to find telephone numbers by searching on a name. There is a possibility for each employee to fill in their personal profile, but this is not done according to Person A. Fourth, there is an internal website where an employee can search for available courses. When interested in a course, an employee can discuss with his or her manager if it is possible to follow that course. Person A notes that, although an employee who finished a course should update their profile, this is usually not done. Fifth, a new Microsoft SharePoint system is in use since recent. According to Person A, however, the unrolling of this system to the whole organisation and getting most of the employees to use it has not succeeded. This is mostly because of a lack of support for the persons who manage the system, a limited amount of promotion and ongoing technical problems.

Person A envisions a future mobile app that is more user-friendly and practical than the above described systems. This app would have an easy to use search function for finding people with specific knowledge.
Similar to GuruScan argues Person A. Further, it would have a function to create teams and a user can add others to a team. When starting a team with a specific purpose that requires specific knowledge, a request can be send out to others that persons with that kind of specific knowledge are sought. Third, a function to create a dynamic knowledge network. Within this network a user can go to a more detailed level when selecting a subject. Also, it must be able to add or delete persons/topics at any time (not a static picture).

To conclude, Person A notes that a cultural change is in progress where people become more and more aware of creating and sharing knowledge in networks for example. However, a lot can be improved. Also evaluation and measurability of initiatives are important. Concrete results help to get support from higher management. This is difficult in relation to the knowledge cafes for example. In that sense, he argues, it seems that the GuruScan Team Accelerator may give more concrete results (e.g. network graphs).

3.3 INTERVIEW 2: ORGANISATION 2 (PERSON B)

Organisation 2 is an international hard- and software company with more than 120.000 employees in 145 countries and its headquarters in the United States of America.

Person B worked on both internal and external projects of Organisation 2 in both project management and substantive roles for approximately 16 years. This included, for example, intranet migrations and taxonomy projects that deal with questions such as ‘how are we going to structure all available knowledge and information is such a way that it is easily findable?’ Over time, human aspects began to play a role more and more, argues Person B. A distinction between explicit and tacit knowledge is useful to indicate that some knowledge may be intangible or silent, and maybe even unconscious. In such cases, KM is more about creating conditions in which you (expect to) steer knowledge in the right direction. At a certain point, Person B felt his job became too narrow and was holding him back. He quit his job and started his own self-employed company in 2011. This gave him more freedom. For about 2.5 years he worked as this company and focussed on personal productivity (e.g. offered training and consultancy services that help knowledge workers and their teams to improve productivity). During this time, he soon discovered that ‘knowledge management’ is generally not a term that companies are eagerly waiting for. Therefore, he positioned himself in the field of performance improvement; something more concrete and appealing to decision makers. Since begin 2015, he started his part-time PhD research in the field of KM. Connected to this research, he started a new self-employed company that now focused on applied knowledge management in the field of potential knowledge loss due to aging of staff. He is aimed to help organisations setup and manage knowledge retention trajectories.

When speaking about commercial companies, Person B sees performance improvement of the company in question as the most important outcome of KM. Generally, this can be linked to variables such as profitability, market share or the number of innovations for that company for example. He believes that KM should always contribute to such hard criteria.

In practice, he has often encounters a disconnect between people from a KM background and people from a business background. He pictures the following situation as an example: when a group of knowledge managers sit together, topics quickly turn to subjects such as the difference between tacit and explicit knowledge, data-information-knowledge pyramid et cetera. In contrast, business people generally
do not find this very interesting and prefer dealing with concrete questions such as ‘how can we solve this problem?’, ‘How can we improve customer satisfaction?’, or ‘How can we prevent this project to become a great expense?’ This divide in perspective, Person B thinks, is one of the biggest reasons why KM as a field is relatively isolated.

Person B argues that one of the hardest parts is making the business case of a KM project clear to the client; one does not want to promise too much or too little. He is of the opinion that one generally should not want to try and quantify KM initiatives. For example, he argues, GuruScan offers an expert finder solution. This is useful and it would be great if it is a success, argues Person B, but how could one calculate a ROI (Return on investment) of this project for example? This may be possible with much effort and mathematical formulas, but that is not the way one should want to discuss such a project. He proposes a different approach to such a project: an organisation could think by itself ‘we are this type of an organisation, with this sort of problems and we feel resistance when executing our primary tasks; something like GuruScan could make this resistance less’. It may be a different way of looking at things, argues Person B.

He also acknowledges that others hold a different opinion. That is, that KM initiatives are quantifiable (and should be quantified) in terms of added value. He gives an example of an oil and gas company in which people indeed quantified a KM project and came to a certain amount of X million euros. For them, argues Person B, this amount was justification enough. In contrast, Person B’s approach is different: he tries to find justification in the trust from the client and he links the outcome of the KM project to more ‘soft’ targets instead of such ‘hard’ targets. He adds to his approach that he also reasons and talks in line with a business point of view. That is, asking and answering the question ‘How does the performance of the organisation improve by investing time, money and energy in this KM project?’

He gives an example of a project he did for a knowledge worker of a Dutch municipality. This person worked within the real estate sector of this municipality. His job included many complex factors such as multiple properties, high amounts per property, long-time projects and situations with many stakeholders. This person had difficulty to keep oversight and handle all these factors. Person B helped this person by handing him and teach him some Personal Knowledge Management (PKM) tools, including mind mapping. This helped that person. The municipality invested a certain amount of money in this project and the fact that this person found it useful was justification enough for the municipality.

Person B sees such PKM tools as items in his ‘KM Toolbox’. Over the years, he gained experience with a large number of methods that he shaped into ‘KM tools’. Examples are after exit reviews, mentoring, peer assist, post project reviews, mind mapping and Getting Things Done (GTD). GTD is a framework that includes techniques, processes and principles that help a person get more structure in dealing with tasks. By storing (e.g. writing down) tasks in an efficient way, the need to remember these tasks makes way for the actual execution of the tasks. He sees these methods as tools out of his toolbox that he can use. He notes, however, that when selecting tools out of the toolbox to help a client, this is not done in a strict sense ‘this is the tool and this is how you have to use it’. He always tries to adapt the selected tools to his client’s individual situation. Person B also wrote an opinion paper that makes a case for personal knowledge management in addition to the often emphasized social dimension of knowledge management, so he argues. In this paper, he states that it is important to create the right conditions for knowledge workers to think independently. Therefore, he argues, tools are needed that value the individual and not only as a member of a wider community. He argues that by using PKM tools and techniques (e.g. GTD), knowledge workers are likely to experience more space in their lives, as well as be
more open to social-emphasizing KM. In a subsequent opinion paper by Person B, he argues that GTD is about information-, time-, self- and knowledge management. GTD should be seen as a worthy PKM tool.

Another project he did was helping a group of about 25 specialists registrar (AIOS, Arts In Opleiding tot Specialist in Dutch) to deal with scientific research in an efficient way. The main tool he used in that project was Getting Things Done (GTD). Gladly, he argues, that also in the case of this project, no hard quantitative results were asked such as ‘what is the individual improvement in the scientific output of an individual?’ Learning such skills as included in GTD is important and is valuable, also in the long term, argues Person B.

Returning to Organisation 2. Person B states that the organisation does not make a distinction in importance of knowledge, or classify certain knowledge as crucial. However, the organisation does focus on and differentiate competencies. This may be a difference in nuance, explains Person B: the difference between knowledge, competencies and skills. One might see them as meaning the same, just other terms, while the others might consider skills as something different from possessing knowledge. Within Organisation 2 it’s called competencies.

Competencies are stored in a system and are used in job profiles. For each job/role within the organisation a list of competencies is defined and dependent on one’s senior level, a certain score on these competencies is expected. This method is especially relevant for sales functions. Based on the interactions between the employee and his or her manager, the manager scores that person. For example, a manager might say to a person he manages: ‘I find the skill of conducting strategic conversations with a client very important. It is important you are at least at level 3. Based on the examples x, y and z, you perform above average so I give you a score of 4’. It is also possible that one might score a 2 where a 3 is expected. Then a manager might ask that person to follow certain training sessions, intensify supervision, or give practical assignments. Such conversations are frequently held with sales personnel. The results are used to manage the individual, but also aggregated to see how a group or department performs. For example, management might conclude that the level of ‘generating leads’ is lower than planned for a certain department. Higher management has the option to search within the organisation on a competence X and see who scores high on that competency.

This way of looking at people and competencies is a rather structured and detailed view on an organisation’s intellectual capital, argues Person B. For him, this system became too restrictive at a certain moment. He felt like a part of a (metaphorical) big machine. This machine is tuned to perfection, he argues, but too restrictive for him as an individual. Qualities, knowledge and ideas he had that did not fit the strict job profiles were overlooked. This made him quit his job and choose for more freedom as an independent contractor. ‘A blessing’, he argues. Person B states that this neglecting of additional qualities is a downside of trying to explicitly name in detail ‘what is knowledge’ or what the required competencies are.

Person B agrees to the conclusion that Organisation 2 does have an organisation wide insight in the predefined job profile competencies of its employees and that it does use this information (besides the question whether or not the used system is a good method). However, additional qualities, competencies and knowledge of employees which do not fit the picture may be overlooked.

This detailing of what competencies are needed to fulfil a certain job may also be linked to the market system Organisation 2 operates in, argues Person B. Organisation 2 is a stock market listed organisation.
This means that Organisation 2 manoeuvres in a complex system of different stakeholders who, for example, require certain rates of growth, or profitability. Person B sees Organisation 2 as building a metaphorical machine to deliver such outcomes. To accomplish this, it might be very useful to know and detail exactly what types of persons are needed, who are able to execute certain tasks, argues Person B. However, people that do not feel comfortable in such a strict system, will eventually leave (just as Person B did). In the long run, he argues, such losses may affect the organisation.

In contrast, Person B hypothesizes that more and more people and organisations are changing the way they approach knowledge. People are looking for more freedom, also in work. Person B argues that the typical Key Performance Index (KPI) way of thinking, ‘we invest a certain amount X in a team and expect these 10 outcomes’, is becoming obsolete. Because, when ‘what gets measured, gets done’ does not lead to organisational success, the organisation might have a problem. Some newer, bigger companies do acknowledge that more freedom is good for innovation. He gives the example of Google who offers employees a certain amount of time each week to be freely spend on projects of that persons’ liking. This deliberate ‘not specifying everything’ is an interesting movement within the field of knowledge creation, her argues.

Returning to the insights of Organisation 2. Person B thinks that Organisation 2 does not have a decent insight in the social network of its employees. For example, insights in questions such as ‘who often collaborates with whom?’, ‘are there any clusters of people which are highly introverted?’ or ‘who act as a boundary spanner for clusters of employees’. Insight in nodes (persons), other than defined by the organigram, is not available, he argues. Organisation 2 is a very hierarchical organisation with the power base located in the USA. The hierarchy is defining and managers often act as a passageways for information streams. If one would make a network graph depicting the informal communication streams within the organisation, he expects this graph to match, for a great part, the formal hierarchical structure.

In his time, there was some experimenting with social network analysis, but that was never widely introduced. This was a popular topic within the KM field at that time. Maybe nowadays, he argues, with the popularity of everything ‘social’ the interest in visualising how people really work together may come back. However this is not an integrative part of Organisation 2’s daily routines.

At a smaller scale, the phenomenon of a ‘matrix organisation’ does occur. For example in a collaboration between the marketing and product development departments. Organisation 2 also uses Communities of Practice (CoP). The organisation was not interested in how the knowledge sharing processes between people worked and how this can be visualised, but saw the CoPs as black boxes. That is, the CoPs are seen as something that works (knowledge is being shared and it contributed to employees’ satisfaction), but how it works is not of the organisations’ interest, argues Person B.

Changing to the subject of potential knowledge loss due to leaving employees. For example, due to retirements. Person B argues that for some companies collective aging is not an issue. For example young IT start-ups. For them, knowledge retention of valuable employees is an issue, but this is usually not knowledge based on years of experience.

Within the public sector, potential knowledge loss due to collective aging is an issue. He gives examples of a Dutch municipality and a public organisation in the field of employment. Both organisations have thousands of employees and a very high average age.
The organisation in the field of employment faces a large outflow of employees. This is because of required savings, which lead to letting employees go and not renewing temporary contracts, and also because of collective aging (employees retire), explains Person B. To cope with this outflow, the organisation now fully aims at digitalising. This means setting up call centres and replacing manual processes with digitized processes. Person B gives an example of a consultant who may have worked for this organisation for many years and through experience and training session have become very good in personal contacts with the clients. This work may be his passion. However, in the new digitized automated situation, this knowledge is not needed anymore. By digitizing the organisation, the knowledge that was important before is not of that importance anymore. The outflow of employees, which mostly possess obsolete knowledge, is therefore not a real problem to this organisation, he argues. Note, however, that new IT related knowledge may have to be acquired.

Person B believes that this digitizing of an organisation should not be applied in general to any organisation. He gives the examples of potential knowledge loss of people who perform the maintenance of specialized weapon systems or knowledge workers who run the nuclear reactors in the Netherlands. This specialized, often procedural knowledge may be stored to some extend in (written down) procedures, but there is always a contextual part lost, he argues. Person B argues that one may describe the procedure of restarting a nuclear reactor, but a part about all the choices and reasoning behind this procedure may be lost. This may be overlooked in general, he points out: that always a contextual part is lost.

Within Organisation 2, Person B actively participated as both a mentor and mentee in mentoring programs. This was always on a voluntary basis and on a small scale. Person B believes that a lot of organisations would benefit from organising such programs on a larger and more structural basis. When, in the future, Person B has more time on his hands, he would love to offer such mentoring programs to organisations. He sees real value in connecting elder employees who have a lot of experience, to young new employees who may bring new methods and insights. This way both parties benefit. He is not aware of any organisation who does perform such mentoring programs on a large and structural basis. For example connecting every employee above a certain age to a younger employee. Person B argues that an organisation should not only focus on attracting valuable young people, but also look at the older generation who possess a lot of experience and possibly valuable knowledge.

3.3 INTERVIEW 3: ORGANISATION 3 (PERSON C)

Person C is Manager Online at Organisation 3. He manages a department ‘online’ of 33 employees which is responsible for all online activities of Organisation 3. This includes development and maintenance of the secure online client environment, the app of the company, all social media channels and all online marketing campaigns. He works at Organisation D for over a year and has many years of experience as a manager in the banks and insurance business. Although person C is not a knowledge manager, he did follow a KM course during his MBA study in the '90s.

Organisation 3 is a Dutch financial institution that incorporates banking and insurance activities. The organisation employs about 6500 people.
Interview

Person C notes that his daily work involves little knowledge management. He does, however, use a Management Information System (MIS) in which all turnovers, sales and other information are updated weekly. These financial ratios (risk, compliance, control) are seen as crucial knowledge to the organisation as they indicate the financial well-being of the organisation. Person C does not know who defines these ratios or how often this is done. Because ‘online’ is a specific field, he further uses a customized online dashboard (also part of MIS) that shows different metrics of different online channels. For example the real-time number of persons who apply for a request, or the real-time number of visitors on a webpage. Besides this MIS system, he uses no other KM systems.

The organisation does have a department responsible for all MI related services including the maintenance of the data warehouse. It also incorporates a business change management group which run projects. Beside these groups, Person C did not come across a KM department.

Person C sees knowledge sharing, knowledge creation and knowledge retention as the most important goals of KM. This is a basis for a learning organisation. He argues that a KM initiative can be seen as successful when insight is gained in the available expertise, when knowledge is shared and when knowledge is created. A KM initiative is not successful when it stays at the point where insight is gained in the available expertise, but the knowledge is not accessible or used, says Person C.

According to Person C, one main example of a KM initiative that has not been successful within Organisation 3 is the ‘intranet expertise initiative’. This initiative is a people finder function within the intranet environment. Each employee has his own online profile including work related information such as name, function, department and contact info, but there is also the possibility to describe one’s own expertise and hobbies for example. The search function of this people finder services allows for searching in names but also on general keywords within the other fields such as expertise and hobbies.

Person C sees the potential of this system of being a valuable body of knowledge to see what knowledge is available by whom in the organisation. However, he rarely uses the finder as he feels that he does not (yet) need it in his daily work, he does not miss the functionality, and he wants to prevent even more people coming by his office asking questions. He has enough work to do already. This is also the reason why he did not fill in his own expertise and other additional fields in his own profile. Further, he argues that there has been little to no incentives by the organisation to fill in his profile and use the service.

When he just started working within this organisation, he was pointed out the profile function, but never again later on. He never experienced his manager telling him something like ‘Why is your profile not filled in? We, as a company, think this is important’. Also, no such incentives from the Human Resource (HR) department are given. He has the impression that also other colleagues do not actively use the service or fill in their profiles. One of the biggest problems is the lack of control and the lack of promotion and steering on this subject by higher management. In summary, Person C sees the intranet expertise initiative as a missed chance of something that can be useful and valuable for the organisation and its employees.

Related to the little success of the intranet expertise initiative, there is (still) a limited insight in experts outside one’s own department. Person C’s department contains 34 employees including himself. He knows all of them personally, and therefore also knows more about their non-job-related expertise and skills. Outside this direct social network, Person C acknowledges the limited insight he has in the expertise of other colleagues. He can find the job description of a person and his or her hierarchical position. Based on this, he makes assumptions about that person’s job-related expertise, but when this person did not fill in his or her profile, no insight is given in other potentially valuable knowledge, expertise and skills. For example knowing if that person is good in writing plans, is highly creative, has a lot experience in project
management (possibly in a previous job in a different field), or has a lot of insight in the market is useful to know. Person C acknowledges that such insights should be available, but unfortunately that is not the case.

Other initiatives within Organisation 3 include:

- Meeting each six weeks with the whole marketing and online department (about 80 employees) to update each other about the latest processes.
- A hackathon has been held. This is a social event in which computer programmers and others involved in software and hardware development (including graphic designers, interface designers and project managers) collaborate intensively on software projects. Often with a goal to create usable software, sometimes simply for educational or social purposes.
- Organisation 3 uses different e-learning tools. Every employee has to pass an e-learning trajectory related to the correct way of working within the organisation and financial field. This is in accordance with the law of financial governance (Wet op Financieel Toezicht in Dutch) and includes learning how to handle specific information for example.
- Within the intranet environment there is a social news section that lets users ‘like’ and ‘share’ news items.

Organisation 3 structurally examines and scores their employees’ development. This includes the scoring of performance, expertise and potential (e.g. below average, average, above average) and the risk of that persons’ leaving the organisation. This is done twice a year for each employee and usually involves a direct manager of that employee, a higher manager and a person from HR. Person C is also involved as a manager in these meetings. Together they discuss and estimate the risk of that person leaving the organisation directly, in short term, in longer term or not likely for years, for example. Also, the importance of that person to the organisation is discussed, what includes that persons’ knowledge and skills, but also social contacts for example. This way, the impact of that persons’ leaving is estimated. All these examinations are based on the direct experiences with that person, but also on what they hear from others (e.g. direct colleagues of that person for example). No number of days absent are used for example. If a manager notices that an employee feels unhappy in his or her own skin and talks about potentially leaving, and that person has crucial knowledge, then actions may follow. One could then try and make that person more comfortable, or arranging the sharing of that knowledge for example. The latter option makes the organisation less dependent on that person. This semi-annually examination is not only intended to cope with employees that may leave, but also to promote high potentials and give them more opportunities. For all cases, Person C is not aware of a standardized procedure or guide of how to handle these cases and what steps are recommended and have been proven successful. In practice, Person C may come up with ideas to handle these cases.

Person C describes the following four ways in which KM can be valuable to an organisation in general and Organisation 3 specifically:

- By giving insight and access to available expertise within the organisation (e.g. the potential of the intranet expertise initiative).
- Structurally evaluating projects and storing and giving access to ‘learnings’. These learnings limit unnecessary ‘reinventing of wheels’. Person C argues that in all companies he has worked, he often found out by accident that things already had been developed or thought of. This was, however, never documented. In general, evaluation is important but often neglected in practice. It requires discipline.
• Giving access to the latest processes and procedures within the organisation. It takes time and effort to find out ‘how things work’. Especially when you are new to the organisation. Eventually, you will figure it out, but clear guides would definitely help and decrease search time.
• Making the latest developments within important fields easy accessible to the employees of the organisation, including recent research publications.

He notes that these topics can be improved in Organisation 3. The filling in of profiles and using that system, and structurally evaluating projects require discipline that people sometimes lack. In addition, such KM activities are often seen as additional (unwanted) work that requires free time besides the usual work. This may also be linked to the often intangible benefits. Therefore, Person C argues, the organisation should be more strict in controlling these activities (maybe force them up to a certain point) in order to get it working initially. Maybe later on, when employees experience the usefulness of the initiatives, they become more motivated themselves.

3.4 INTERVIEW 4: KONINKLIJKE VISIO (R. KOMAN)

Koninklijke Visio is a Dutch centre of expertise in the field of partially sighted/blindness with over 3000 employees across the Netherlands. The ministry of public health and sports (Volksgezondheid, Welzijn en Sport) contributes funds to Koninklijke Visio such that the organisation can make knowledge from this sector available both within and outside Koninklijke Visio.

Ruben Koman finished his study Information service and management (Informatiedienstverlening en -management, IDM) in 2001 in the field of KM. This study is focussed on the structuring of information in which IT is one of the facets to support the information and KM processes (content and accessibility), explains Koman. Communication skills are also important. KM is not only about systems, but also about making people want to act, he argues. Now Koman works at Koninklijke Visio as Advisor Knowledge within the department Knowledge Expertise and Innovation (KEI). This department is responsible for the KM within Koninklijke Visio.

The interview with Koman (plus additional sources he referred to) provide a wide range of detailed information. A summarized and codified transcription including information from these sources can be found in Appendix 1 (in Dutch). Now follows a summary based on the subjects described in 3.1.

Koninklijke Visio incorporates a variety of KM initiatives including:

• Social intranet environment (based on Microsoft Sharepoint) that includes a news page (‘Uitgelicht’), profiles of employees (‘Wie-is-wie’ or ‘kenniskaarten’), a place to find information on certain subjects such as mobility and participation and well-being (‘expertiseplein’), a place to find scientific literature and digital magazines (‘literatuurplein’, not yet implemented), and a central storage of multimedia. With the future Sharepoint 2013
• Developed books describing methods and how to work in an approved and standardized way (available on the intranet). Describes methods, working practices and means. For example methods ‘specialistische zorg’ (specialised care) and ‘het eigen initiatief model’ (own initiative model).
• Communities of practice (CoP) (e.g. ‘expertise-, kennis-,vakgroepen’). Gather once a month, quarter or less, dependent on the group. Each group contains about 5 to 15 persons of different
age categories. They are often practitioners with real in-depth practical experience and expertise, but also (knowledge/project) managers. The CoPs are formed around the subjects that are seen as important for Koninklijke Visio (‘speerpunten’ or spear points), such as Cerebral Visual Impairment (CVI), Tactile perception and braille, and Acquired brain injury. These CoPs are concerned with questions such as ‘what is important at this moment?’, ‘are there any knowledge gaps?’, ‘what are the latest trends?’ and ‘what is important for the organisation to look at?’.

These CoPs give advise to the organisation in what can and should be improved.

- Knowledge sharing days. Each year, all CoPs come together and present their knowledge to their colleagues. This includes presentations, lectures, workshops, stands. A knowledge sharing day can also be organised on initiatives from KEI or any department of Koninklijke Visio.
- National and international projects in the fields of education, rehabilitation and advice, and housing and day activities. For example the methods ‘specialistische zorg’ and ‘het eigen initiatief model’ are results of projects.
- Inspiration shops. Giving people a stage. Similar to TED talks.
- Internal academy which offers employees schooling.
- Symposia and conventions. Koninklijke Visio organises symposia and conventions, but also stimulates employees to attend (inter)national symposia and conventions, argues Koman.
- Exit reviews (‘exit gesprekken’) and peer-to-peer trajectories. Falls under the program ‘kennisbehoud’ (knowledge retention) and is just started. Not all employees will get exit reviews, as not all knowledge is crucial, argues Koman.
- Retiree club ‘Visioen’. Koninklijke Visio offers retired employees the option to stay actively involved with the organisation and to share knowledge on a voluntary basis, explains Koman.
- Architecture. Koman argues that the architecture of the location Visio Het Loo Erf incorporates lounge areas where people can sit and converse in a calm environment, what stimulates knowledge sharing.

Koman explains that the current use of people finder and number of filled in profiles (wie-is-wie, kenniskaarten) is limited. He notes that in practice employees are often not very eager to fill in additional fields, and because the filling in of the field ‘knowledge and experience’ is not mandatory, only a limited selection of profiles have this field filled in. Therefore, he argues, there is a limited insight in who is involved in what. With the introduction of a new Sharepoint 2013 version, more ‘social’ and ‘personalisation’ options become available, such as the ability for a user to ‘follow’ items and information will be more personalized to the user. Also, the profiles will include additional fields such as ‘current and past projects’, ‘current and past CoPs’, ‘publications’ and ‘Yammer, LinkedIn, Facebook links’. Also the HR systems will be connected to the new profiles function. Some information is mandatory to be filled in into the HR systems (otherwise an employee cannot be paid for example). This information will then automatically be filled in into the new profiles. Koman argues that, also then, employees will not be forced to fill in or update all their profile fields. This is in line with the current popular topic of empowerment or being in control (‘eigen regie’ in Dutch). In practice, he explains, this means for an employee that he or she, in consultation with his or her manager, determines what he or she shares and participates in. Koman argues that people have to be intrinsically motivated to share knowledge. He expects that, when an employee is already involved in CoPs, this person is already motivated to share knowledge. Then he or she will also fill in and update his or her profile regularly, he argues. Koman hopes that with (just) using this HR connection the new initiative will automatically grow and the sharing will be based on intrinsic motivation.
Koman argues that the digital systems and the CoPs are the largest and most important KM initiatives within Koninklijke Visio.

CoPs are formed around certain topics of importance (‘speerpunten’, or spear points) such as ‘tactile perception and braille’. As an Advisor Knowledge, Koman attends these CoPs and, besides other things, assures that knowledge is being shared within these groups and throughout the organisation. Also project leaders attend to these CoPs. They can help emergent ideas or initiatives to become projects, he explains. Koman argues that projects can be seen as an outcome of KM. That is, he explains, if it becomes apparent (for example based on a CoP) that certain ideas from the workplace may have to be developed further and they are then subsequently shaped into a project, then that project may be seen as an outcome of KM.

Koman argues that an organisation should not do KM because it should do KM (e.g as a part of a hype). Koninklijke Visio implements KM because of two main reasons. First, the government asks the organisation to share knowledge. The government asks this because Koninklijke Visio is one of the few organisations (others include Bartimeus, Kentalis and Robbert Coppus) that operates in this niche field of visual impairments and no specific research institutes perform researches of this subject. The small selection of such organisations have been assigned the role to be the knowledge partners within this field. Second, KM is used because the organisation itself wants to work, think and share knowledge in more standardized ways. This means that the organisation incorporates an increasingly scientific way of working with the goal of creating benefits for the client (e.g. the person who is partially sighted or blind), he explains. Koninklijke Visio refers to this as reaching a higher level on the ‘effect ladder’, which indicates the degree of scientific underpinning.

In contrast to linking KM to a better market position or profit for example, the approach in the health sector (including Koninklijke Visio) is different: the principle is that the client has to benefit from it. ‘If a client benefits, that may because of KM, then we say: we have done it!’ argues Koman.

Koman notes that KM is essential for the flow of knowledge, learning from each other and working at a more standardized and scientific level (i.e. reaching a higher level on the effect ladder). Especially in large companies. Within small companies, large expensive, automated and integrated systems are not be needed; an Excel sheet or notepad with colleagues’ locations and functions may suffice. For large organisations such as ING, Shell and Koninklijke Visio itself, with over 3000 employees in different locations and with thousands of clients, such IT systems really work, he argues.

Koman further argues that the combination of IT systems and CoPs and projects is essential; having all three (as Koninklijke Visio does). The latter two contain the real added value, he argues. Having only IT systems does not work. The development and implementation of such a knowledge household (‘kennishuishouding’), however, requires a decent amount of financial investments. He states that for smaller organisations this may not be beneficial, but for such a large organisation as Koninklijke Visio it definitely is.

The following example shows how methods developed in the workplace can transform into (scientifically proven) standardized methods (the effect ladder). An employee in the workplace may have developed a useful method that works for the client (for example teaching a client to make coffee). There is no need for a whole variety of different ‘coffee making’ methods, he explains. One or a few such methods may be selected, further developed and tested/used, and then defined as: ‘these are the good ways to teach a
client to make coffee’. These chosen methods usually have proven themselves to be valid or even scientifically proven to be effective (highest level on the effect ladder). Such methods can then be shared and stored in systems, he explains. Within Koninklijke Visio these methods are stored in the book of methods (available on the intranet).

Koman explains that Koninklijke Visio executes projects in a broad range of subjects, but the end goal of each project is that the client notices that he or she is better ‘equipped’ by Koninklijke Visio for his or her daily functioning in the areas of education, rehabilitation and advice, and housing and day activities. The methods ‘specialized care’ and ‘own initiative model’ are results from such projects and give clients more control over their own life, he explains. The client is able to do more tasks on their own.

Koman sees project management as a means of KM and KM as a part of project management.

He notes that, although management uses means to stimulate knowledge sharing, the organisation tries to place the initiative and coordination at the workplace level. In the end, the employees of the workplace determine where improvement is needed or shortages are, he argues. The key is to let initiatives from the workplace flourish. ‘We propagate that independently set up initiatives are better than all kinds of systems that one thinks of in advance’, Koman says. If there is an initiative from the workplace, then Koninklijke Visio can offer project leaders, for example, if the initiators are not informed of leading a project.

KEI stays informed on such initiatives via the CoPs, people coming directly to them, organising inspiration shops (giving people a stage, similar to TED talks) and contests.

Koman notes the importance of focussing on ‘best persons’ (he calls them ‘energiehaarden’ in Dutch) within the organisation. These people have a lot of creative ideas, are immediately enthusiastic and are willing to walk the extra mile, he argues. These persons are often at the inspirations shops and CoPs. He warns to not overload these persons. If one does not steer them too much and leave them flourish using their own power, then these persons emerge in all layers of the organisation and in all age categories, he argues.

Within Koninklijke Visio, knowledge is valued based on the spear points of the organisation, Koman explains. Each five years, the organisation determines its focus, its spear points. The expertise groups are linked to these spear points and cover 11 subjects including Cerebral Visual Impairment (CVI), Tactile perception and braille, and Acquired brain injury. The knowledge within these subjects, where the client benefits from, Koman considers the crucial knowledge of the organisation. He argues that, within these subjects, the organisation would like results, scientific research, projects and initiatives from the workplace.

Koman explains that this crucial knowledge is available through the book of methods, via a periodical digital magazine ‘expertisewijzer’ (linked to the expertiseplein; shows recent expertise activities including the work of CoPs), and scientific studies, symposia, or conventions (when an expertise group starts such an event, for example).

On the one hand, information is ‘pushed’ to employees or categorized as ‘need to know!’. For example in the expertwijzer, on the intranet and in the book of methods. Koman argues that an employee is expected to use these defined methods or have a valid reasons not to. In the latter case, he or she needs to let the organisation know. Otherwise, questions will be asked. Thus, some push information is also mandatory to
some extent. On the other hand, in line with the used ‘eigen regie’ approach within Koninklijke Visio, an employee has (to some extent) freedom in what knowledge he or she acquires, explains Koman. For example, by discussing and developing a personal development plan in collaboration with the manager. These meetings are also used to evaluate the personal development of that employee and whether his or her knowledge and experience is (still) in line with his or her function profile. For each function, specific competences are defined the person in question must have (this system is called ‘functiehuis’ in Koninklijke Visio). Koman argues that at some point it might happen that a project is developed in which all employees with a certain function must follow a training session. This is then one of the results of one of the KM processes, he argues. Thus, in a sense those employees are then “forced” to acquire new skills or knowledge. Koman further states that, coming from the health sector itself, people may be inclined to learn more. For example in the minimum number of accreditation points each year.

Koninklijke Visio has an insight in ‘who knows what’ through managers who know the employees at their location or department, and through the collaborations in projects, expertise groups and scientific studies, and all means discussed earlier. This way, it automatically becomes apparent where the knowledge resides, he argues. In addition, also the profiles (kenniskaarten, wie-is-wie) contribute to the insight.

Koman argues that different locations stay informed of each other through the CoPs for example. There, employees from all over The Netherlands come together. Koman notes that a culture of ‘islands’ (eilandgevoel) will never go away. However, due to all the means discussed, Koman notices more uniformity. The organisation is merged out of different locations who did not know each other before, now Koman notices that people can find each other better. He has limited insight in the individual cases in which new collaborations have been established between people who did not know each other before, but he is sure that people are now more aware of each other. He notes however, that one must feel the need to acquire and the urge to contribute, in order for knowledge sharing to work. Koman explains that Koninklijke Visio does not focus on the persons who don’t, but the persons who do; the ‘best persons’. And if a person keeps lacking, he or she will be told by the manager to show more commitment, he argues. He argues that it is a utopia to think that one can get every employee within Koninklijke Visio to actively share knowledge. Therfore, they focus on the people who do have such an attitude.

Koninklijke Visio just (re)started a program ‘knowledge retention’. This is still in its early stages and has to be developed further, Koman explains. The goal is to initiate exit reviews or a mentoring program for employees who hold crucial knowledge, long before their leaving. An example of an employee who holds crucial knowledge (called ‘kritische kennishaard’ by Koman) is a clinical physicists. His knowledge is highly specialised and only a few of such persons are out there, he argues. Koman argues that this person, during his career, has already shared a lot of knowledge in project and scientific research, for example. However, if he plans to leave, Koman explains, the organisation finds it important to offer exit reviews or peer-to-peer trajectories. Such a clinical physicist holds knowledge in a field that is crucial for the organisation, argues Koman. He further notes that not all employees will get exit reviews, as not all knowledge is crucial. Also, a person may hold crucial knowledge that is not directly linked to his person, but more a personal level, he argues.

Koman notes that employees who qualify for such knowledge retention programs have made a name for themselves within the spear point subjects during their career. These subjects contain highly specialized knowledge that makes the organisation matter, argues Koman. If a person is and has been a great added value to such a subject, either through his function or personal knowledge and experience, and made the
organisation matter even more, then this person will become noticed by the organisation, explains Koman. These persons have usually shown themselves to the organisation by their involvement and efforts in projects and CoPs for example. Koman argues that Koninklijke Visio can even try to keep them involved via the retiree club ‘Visioen’. This club gives retired employees the option to stay actively involved with the organisation and to share knowledge on a voluntary basis.

Koman notes that social media, such as LinkedIn, Twitter and Yammer (internal social media used by Koninklijke Visio) have become essential for keeping up and watching the market for example. He argues that in this overload of information, a person must make their own decisions: ‘what knowledge is important for you to keep up to date?’ Koman argues that, also in cases where the person is question is not skillful with such digital tools, it comes down to intrinsic motivation.

To conclude, Koman identifies a number of difficulties in KM. First of all, people have difficulties with having to share knowledge besides they daily job. For example, people in day care or in education; they work 8 hours a day already, and then the sharing of knowledge (e.g. keeping up to date or attend meetings) have to happen besides this full working day. That is a challenge, Koman argues: making employees from the workplace share knowledge besides their daily job.

Second, Koman notes that the organisation prioritized having hands at the bedside (‘handen aan het bed’) in order to create benefits for the client. This is also the most profitable he explains. Koman argues that if people are then willing to partake in other activities, such as knowledge sharing, they are often being told to return to their bedside job. People need to be convinced, explains Koman; a combination of both is important.

Third, Koman explains that this convincing goes sometimes better and sometimes worse. He also sees this as to convey a vision. This also means for KEI to talk to different managers from different departments such as education or revalidation and advice. Koman argues that it is needed sometimes to really get out there and convince people that it is important that the employees let the knowledge flow. And also that, in the end, the client benefits from it, not only from the hands at the bedside, he argues.

Fourth, Koman notes that knowledge sharing is high on the agenda of Koninklijke Visio. Also different subsidizing foundations and the subsidizing government examine this. He argues that knowledge sharing is of clear importance for an organisation to be an expertise organisation, such as Koninklijke Visio is.

Fifth, Koman argues that more and more employees, including managers and CEOs, see the importance of knowledge sharing in the sense that it is an essential part of being an employee of Koninklijke Visio, an essential part for the success of the organisation, and an essential part for creating benefits for the client. The latter is always the last step, he argues. He argues that this cultural and behavioural change is difficult and an ongoing process.
4. GURUSCAN KNOWLEDGE NETWORK GAME

As a part of this thesis project the GuruScan Knowledge Network Game (KNG) is developed. This is a workshop/game including specially designed materials. An option for a KNG session with guidance from GuruScan is available (€ 597,-), but also a stand-alone package (€97,- excluding created network graphs, €197,- including created network graphs). That is, an organisation can also purchase the materials only (including a guide). In addition a free-for-download set of pdf files of the materials will be available. The KNG is a workshop with a duration of about one hour and is suited for groups up to 12 persons. The KNG helps teams or groups to determine what knowledge topics are crucial to them and which reachable persons the group argues to possess this knowledge (both inside and outside the group department or organisation). This gives insight in the social knowledge network within and adjacent to this group. This concept is related to the notion of transactive memory systems.

4.1 KNOWLEDGE NETWORK GAME EXPLAINED

The idea for a KNG emerged within GuruScan based on experiences in practice. It was found that sometimes it is difficult for people to really grasp the concept of GuruScan and understand how its software products work. Also, a software product is less tangible than a physical product like a laptop, bike, mug or smartphone for example. One of the underlying ideas for the KNG is, therefore, to offer a more tangible way for teams or groups in organisations to experience the GuruScan concept. Further, the KNG is even more accessible for the organisation than the Team Accelerator workshop (no laptops needed, lower price point, can be executed without a person from GuruScan to be there) and is more scalable for GuruScan (a stand-alone KNG does not require the presence of a GuruScan employee). Thus, for the interested organisation, the KNG is a tangible, affordable and fun way to get an insight in the knowledge network of a team or group and at the same time experience the GuruScan concept and see the value and potential for possibly other groups or even the whole organisation. For GuruScan, it offers a more scalable product and can also be seen as an acquisition tool for potentially more workshops or the full online Expert Guide service.

4.1.1 KNOWLEDGE NETWORK GAME ITEMS

Figure 8. GuruScan Knowledge Network Game items.
The KNG contains the following items (see Figure 8):

- **1** Packaging box (not in the picture). This contains the items below.
- **1** Storage tube. This contains the large sheets.
- **1** Roll of removable tape (not in the picture). This tape is used to hang sheets on the walls and does not damage the walls.
- **2** Guides (not in the picture). This explains the concept of GuruScan, steps of the KNG, possible analyses etc.
- **15** Knowledge topic sheets (A1 size). Each sheet relates to one knowledge topic (up to 15 knowledge topics can be defined). These sheets are to be hung on the walls.
- **1** Participants list (A1 size). Each of the participants fills in his or her name and e-mail address in the field of his or hers preferred colour. This sheet can also be hung on the wall.
- **12** Sets of endorsement stickers (45 stickers per set) (A7 size). Each participant (up to 12 participants) is assigned to his or her own colour and logo. This enables the making of connections later on.
- **12** Nameplates. Each participant also fills in his or her name and department on their nameplate and places it in front on the table.
- **12** marker pens. To write on the various sheets.

### 4.1.2 KNOWLEDGE NETWORK GAME IN ACTION

A **KNG** session takes about an hour and is based on a number of steps. These are briefly explained. See Appendix D for the guide in Dutch.

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**Figure 9. KNG rounds displayed on the back of each nameplate.**

### Preparation

One KNG session is suitable for up to 12 participants and 15 knowledge topics. One person is responsible for leading the session. This can be someone from the organisation or group itself or someone from GuruScan. The session leader can also participate in the game at the same time. A suitable room needs to be booked in time. The room needs to be large enough for the group to walk around and there should be enough wall space. Also, the participants need to be invited on time. Example emails are included in the guide.
Round 1. Introduction (10 min)

**Figure 10. KNG round 1.** Colour and logo matching sets of endorsement stickers (top left), a nameplate (bottom left) and a marker pen. Fill in own name and info on nameplate and participants list (right). Do not fill in your own name on the endorsement stickers!

The session leader gives a short introduction and presentation about social knowledge management, the time plan for the day and what is the goal of the session (see also Round 2). A presentation is available from GuruScan to use. Each participant chooses a colour, takes the corresponding set and fills in the corresponding fields on the participants list and their nameplate (not the stickers!). See Figure 10.

Round 2. Defining knowledge topics (10 min)

**Figure 11. KNG round 2.** Example of four knowledge sheets on which the topics are filled in and hung on the walls.

Up to 15 knowledge topics can be defined (15 sheets). It is key to link a goal to the KNG session. This goal gives direction for the determination of relevant knowledge topics. What knowledge topics are essential to reach this goal? For example, a newly composed team that starts a new project in a foreign country and want it to go as smoothly as possible may choose topics such as ‘knowledge about or experience with
doing business in country x’ or ‘legislations in country x’.
The defining of the goal and knowledge topics can be done during the KNG session, but it is often more effective, practical and timesaving to do this (to some extent) beforehand. For example a team leader, the session leader, a manager or another person can do this. Additional topics or adjustments based on feedback from the participants can of course be made during the session. Knowledge topics usually emerge or are adjusted based on discussions within the group.
Discuss each of the defined topics to make sure everyone understands and agrees on what is meant by each topic.

Each of the defined knowledge topics is filled in on a separate sheet and is hung on the wall (See Figure 11). Hanging the knowledge sheets before the session and then filling them in on the wall gives a better flow.

**Round 3. Endorsing people (25 min)**

![Figure 12. KNG round 3. Endorsing people (top row). Example of four knowledge sheets on which persons have been endorsed by the participants (bottom row).](image)

In this round each participant endorses persons on each knowledge topic sheet. This is done by taking a sticker, writing his or her full name and information on the sticker and sticking it on the respective sheet. This should be done using the following guidelines:

- Clear writing.
- Endorse the persons who you would first go to for help on that specific knowledge topic. Who would you contact first? (Such a person is likely knowledgeable, reachable, willing to help, pleasant in collaboration etcetera). Such a person may be a participant, employee or even someone outside the organisation.
- Do NOT endorse yourself.
One person can be endorsed by multiple participants. Thus one name can appear multiple times on one knowledge sheet.
- 1-3 experts per knowledge topic.
- Full name and organisation/department/contact info/other specification (such that others also know who is meant).
- Do this for ALL knowledge topics.

See Figure 12 for an example of four knowledge sheets on which persons have been endorsed by the participants.

**Round 4: Recap and analysis (15 min)**

The session leader goes by all knowledge sheets and checks if everything is clear: Is each sticker readable (full name, department/organisation/contact info)? Clear who is meant?

First analyses can be made based on first observations. For example:

- Any sheets relatively empty? (see Figure 12, bottom row, second sheet) The group seems to be quite unknown on where to go with questions on this subject. Is this something to work on?
- Any sheets relatively full? (see Figure 12, bottom row, fourth sheet) The group seems to be fully aware who to go to.
- One name appears often on a knowledge sheet? This person seems to be valuable for this group to acquire knowledge on that particular topic. Is this surprising to the group? The group might rely on this person too much, is this a problem? Is the information source may be too limited (subjective) or what if this person becomes unavailable?
- Any participant (almost) not endorsed on a topic that he or she was expected to be endorsed (e.g. because of function, position, experience et cetera)? This might indicate that the groups’ expectations do not match the function description. Is this person possible not very reachable? Is the person him or herself surprised he or she is almost not endorsed on this topic?
- Other unexpected findings?

All such observations must be seen as triggers for further discussions. Each group or situation is different and there is no one solution to these questions. Note that these discussions can take up additional time. Therefore a possibility to use some extra time is recommended.

For the session leader: communicate what will be done with the results, close the session and photograph all sheets for storage. It is also recommended for the session leader to write a summary of the findings and communicate it with at least the participants.

**Creating network graphs**

Network graphs can be created based on the filled in sheets. This is done after the session using dedicated tools. It requires the typing of all names and topics in a dedicated software tool, what can take a decent amount of time (about one hour). These network graphs visualise the knowledge network that was indicated by the group. Usually two types of graphs are made: person-to-person network (Figure 13) and two mode (person to topic) network (Figure 14). The first shows the connections between the participants and the endorsed persons, aggregated over all knowledge topics, the second shows the connections between each knowledge topic and the persons who are endorsed on these topics. The thicker and
shorter the line, the more often this connection is made. This might indicate a closer collaboration and relation between these persons. The more and thicker the incoming arrows, the more often this person is endorsed. This indicates that this person is likely an important resource for this group, at least on the defined knowledge topics. Graph theory and social network theory give a lot of options to analyse such network graphs. Often, simply looking at the graphs and thinking about and discussing what aspects are noticed can be already be useful.

Figure 13. Example of a person-to-person network based on a KNG (anonymised). Each node represents First name – Country (department location). The colours of the participants match the colours used during the KNG. The thicker the line the more times this connection was made. The arrows indicate the endorsement direction. For example, Remy endorsed Robin on multiple knowledge topics.
Figure 14. Example of two mode (person-to-topic) network based on a KNG (anonymised). Remark the isolated node of Luuk. He was a participant, but was not endorsed on any topic.

### 4.2 DESIGN CHOICES

This subsection briefly elaborates on some of the design choices made. This shows the amount of thought that goes into the development of a product.

- Each designed item is branded with the GuruScan logo. This creates brand awareness among the participants.
- Fields that require action (to be filled in) are white.
- An overall flat design is chosen (in line with Windows 8, iOS 8 and Android 5).

The knowledge topic sheet exists of two colours: a dark blue Pantone colour and white (Figure 15). The used Pantone colour is the same as in the GuruScan logo and allows for possible cheaper printing options (only pay for one Pantone colour). By using only this dark blue and white, the colours of the endorsement stickers pop out more. The background ‘tree man’ is also adapted from the GuruScan logo and functions as a tree to hang in the stickers. This adds to the user experience and adds to the value of this sheet against a plain white sheet for example. The structured sticker fields with person logos inside them encourage the users to place the stickers in a neat and organized way.

At the top of the sheet is a white field to fill in the knowledge topic. At the bottom are white fields to fill in the group or session name, the date, the number of the sheet (e.g. 3 out of 10) and the website and corresponding QR code to find more information. The size is A1, which is large enough to...
fit enough endorsement stickers and allow for a text to be readable from a distance. A size of A0 or larger would make the sheet less manageable for one person and way more expensive to print.

The KNG participants sheet has the same background colour and top and bottom design as the knowledge topic sheet (Figure 16). All 12 different colours with corresponding logos are collected on this sheet. When a participant chooses a colour, he or she fills in the corresponding fields on this sheet. These fields are the full name and e-mail address. The e-mail addresses are used afterwards to send all participants the results (e.g. summary or network graphs) or, when it is preferred, only the session leader can receive the results and distribute them on his or her own. The filled in participants sheet is also hung at the wall such that, at any time during the session, participants can see which participant uses which colour. The size is A3.

![Figure 16. KNG Participants sheet. A3 size.](image)

Each participant gets a colour corresponding nameplate (Figure 17). This is folded in a triangle shape and is placed in front of the participant on the table. On the front, the participants’ full name and department are to be filled in. This is especially useful when not everyone in the group knows each other. Also for the session leader it is useful to see the names. At the back of each nameplate (facing the participant, see also Figure 9), a summary of the different rounds is shown including the expected duration. This way, each participant can always check what is next. The flattened size is A4.

![Figure 17. KNG Nameplate. A4 size, 1 of 12 colours.](image)

Each participant gets a unique colour set of 40 stickers and 1 nameplate. The stickers are used to endorse other persons on each of the knowledge sheets (Figure 18). This is done by writing the endorsed person’s name, department/organisation and contact info on the sticker and sticking it on the respective knowledge sheet. The size of a sticker is A7 and fits perfectly on the sticker fields. In addition to each colour a corresponding logo is used. This enables the identification of each participant even when someone is colour-blind or colours look alike in certain circumstances. The main idea behind linking each participant to a unique colour (and logo) is the creation of an endorsement system that can be used to create knowledge network graphs. Each connection in such a graph consists of a source person (participant) pointing to a target person. One option is to write both your own name and the endorsed persons’ name on the sticker, but this requires more writing. By using this colour system, the source person is identified by the colour, the target person by the written name and info. In addition to this practical use, the colours create colourful and vibrant ‘knowledge trees’ and also gives this KNG package a rather unique selling
point. As far as we know, you cannot just buy a package with 12 different colours of similar stickers or post-its. For example, there are packages available with post-its in about five different colours, but not this many.

In addition to these described items, the packaging itself, the included marker pens and the storage tube are standard versions in this stage. These will also be designed in the near future.

4.3 FINDINGS FROM TEST SESSIONS

Four test KNG sessions with four different groups from four different organisations were conducted (see Table 8).

Table 8. KNG test sessions.

<table>
<thead>
<tr>
<th>Groups (in order of sessions)</th>
<th>Organisation</th>
<th># participants</th>
<th># topics</th>
<th># names (incl participants)</th>
<th># references</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>Dutch internet design, marketing and technology company</td>
<td>4</td>
<td>8</td>
<td>21</td>
<td>68</td>
</tr>
<tr>
<td>Group B</td>
<td>International organisation in the maritime, defence, protech and oil and gas sector</td>
<td>6</td>
<td>8</td>
<td>60</td>
<td>135</td>
</tr>
<tr>
<td>Group C</td>
<td>International organisation in the field of energy innovation</td>
<td>12</td>
<td>15</td>
<td>96</td>
<td>275</td>
</tr>
<tr>
<td>Group D</td>
<td>Dutch organisation that provides consultancy jobs for students</td>
<td>7</td>
<td>12</td>
<td>101</td>
<td>123</td>
</tr>
</tbody>
</table>

The following findings were present in each of the four sessions:

- The participants liked the designs and especially the use of the different colours to brighten up the knowledge trees.
- The stickers were indeed placed on the designated fields as intended.
- Most of the participants enjoyed the activity of sticking stickers on the sheets. Some even explicitly told that. It is more active than sitting behind a pc and gives a more energetic atmosphere. People walking around or standing next to each other discussing the names on the sheets.
- In general, the participants seem to prefer to not write too much on the stickers. Some only wrote a name and no department or specification, while others were even inclined to only write a first name. This was usually because the last name was not known or it was known to the group who was meant. In this light, the sticker fields ‘first name’, ‘last name’ and ‘e-mail’ were replaced by ‘name’, ‘department’ and ‘contact info’. This worked much better in the last two sessions. Often a full name is found to be enough for the group to know who is meant, and in combination with some specification as department/organisation/country it is also clear for people external to
the group (potentially a manager who was not at the session for example). Contact info can often be easily found by asking the group member who endorsed that person, using intranet contact pages or LinkedIn.

- An introduction presentation about knowledge, knowledge management, GuruScan, the KNG rounds and outcomes was found very useful to introduce the group to such concepts and prepare them for what to expect. Especially when the participants had no knowledge management background. Giving multiple examples of why this KNG is useful was sometimes needed to convince the group.

- The knowledge defining process conducted more slowly and the knowledge topics were more ambiguous when no goal or focus was attached or no topics were defined up front. This nevertheless led to interesting discussions among group members about what knowledge is crucial for the group or themselves. However, these discussions tended to take a longer time than scheduled within the session of an hour. Therefore, it is recommended to define a goal (or options for goals) up front and/or already define some topics. The discussion of these topics, however, should not be skipped as it forces the group to reflect and think about what is important for them as a whole and as individuals.

- All groups, even the ones that were sceptical in the beginning, were enthusiastic at the end. They found it useful in many ways. For example that they consciously had thought about what knowledge is important to them (as a group or individual) and how they both within the group and outside the group are connected to people on these topics. Not only were the visible results (e.g. filled in knowledge sheets and network graphs) found useful, but also the process itself; the discussions, the observations of how people are connected, the realisation that you do not really know where to go to on one or more of these topics, the wrong expectation that a group member (maybe yourself) would be endorsed on a certain topic et cetera. It can be seen as a reality check for both the group as a whole and also for the group members individually.

- In all four sessions, at least one participant expressed a future vision such as ‘we should do this again in the future when we start this new project’, or ‘now we did this for this group, what gives a limited picture, but we should actually do this with the department or the organisation’. Two of the group’s leaders immediately expressed the intention to organize another KNG in the future, either with the same group and different goal/topics, or different group.

- Although the guidelines for endorsing person are displayed on a PowerPoint sheet, explicitly told and written on the back of each nameplate, some participants were still unsure what to do or did not follow the guidelines. Specifically the endorsing of maximum 3 persons per knowledge sheet. Some participants placed up to 7 stickers on one knowledge sheet. Some variation is no problem, but the idea behind this maximum is that it forces the participants to think of a top 3 for each knowledge topic. It is not about naming as much people as you know, but about pointing out the top few that probably would be able to help you best in a pleasant and adequate way. The number of 45 stickers per participant is also based on this assumption of a maximum of 3 stickers per topic. It must be noted that some groups did not have problems with sticking to the guidelines.

- Sometimes it is difficult to read the handwritten names and information on the sheets and specifically the stickers. The participants are explicitly asked to write legibly. Sometimes, however, it is inevitable to deal with difficult reading. This requires additional effort and time to find out what was meant. Therefore, it is essential to check on the writings during the endorsement round and also at the end of the session. Another factor that plays a role in the
readability is the thickness and type of the pen. This is essentially a choice between a better readability from a distance (marker pen) or potentially clearer writing, but less visibility from a distance (normal pen). To enable readability from a distance and ease of writing, a 1mm thick marker pen is chosen as the supplied writing tool. This distant readability also stimulates discussion amongst participants. Future sessions may point out that another pen may be more suitable.

- During the analysis round of the KNG, the completed knowledge sheets are discussed with the group. The optional resulting knowledge network graphs were generally seen as an icing on the cake of the KNG session. Participants were looking forward to see the resulting graphs. Unfortunately, this process takes time and effort (as explained in the next point), so an immediate result is not possible. However, it is usually possible to create them the same day, send them to the group leader or all participants, such that they can discuss the results. This underpins that the network graphs are seen as something valuable to the group, and that a short turnaround time is preferred.

- The creation of network graphs from a KNG session includes two main steps, namely (1) from written text to a digital spreadsheet or database file and (2) from this file to a network graph. Especially the first step may take a decent amount of time, about 1 to 2 hours. This includes reading of names and typing them into a file. This process is delayed when text is difficult to read or incomplete. Usually a quick search online finds the correct person and information. Yet, this again makes clear why participants must be encouraged to write neatly, fill in (at least) a full name, and the need for checks on unclear writing during and after the endorsements round. This thesis project has contributed to new methods for transcribing the names in a more efficient way, but there is still room for improvement.

Step 2 requires a program to create a visual network graph from the created file. This was initially done using a dedicated software tool which required importing files and changing settings. As a side project during this thesis a program is written in JavaScript (d3.js) that, with the correct file format and data, can automatically create a dynamic person-to-person network graph (similar to Figure 13) and person-to-topic (two mode) network graph (similar to Figure 14). This already saves time, but this second step can be extended and improved in the future.

The following additional findings are more group based:

The first group A consisted of four employees of a web design, marketing and technology company. Together they formed almost the whole company. The session was led by GuruScan. One of the main goals of this session was to get feedback on the designs and to see if the materials were used as intended. This was positive; the designers from the company approved the materials and without specific instructions, the stickers were placed in the correct way on the knowledge sheets. No need for immediate change based on this first session. Based on the filled in knowledge sheets, the group realised that they relied heavily on one person on a couple of knowledge topics. They also realised that they were uncertain who to go to when this person would become unavailable. On another knowledge topic, the group could only come up with two names outside the group what indicated to them that they had limited knowledge resources on this subject. These findings made the group leader/CEO of the company realize and express the need to invest in social networking and exploring the market to at least know what options are they to get additional knowledge. Overall, the group was positive on the process and materials of the KNG.
The second group B consisted of seven employees of an international corporation in the maritime, defence, protech and oil and gas sector. This company employs more than 7500 people in 25 countries worldwide. The group consisted of 5 employees with a technical background based in the Netherlands and one manager of the group, all within the maritime sector. The manager of the group led the session with support of GuruScan. He already had experience with this workshop process, as he had tried it before (based on instructions from GuruScan) with another group based in another country using post-its and flip charts. This time he used the new KNG materials. The knowledge topics defined in the previous session were used again for this session. That way, the manager can compare the results from both groups. During the discussing of the proposed knowledge topics, one additional topic was added. This was a relatively new subject to the group. Besides other findings, the following are most notable:

- At first, some of the participants were not enthusiastic. This was partly based on previous experiences with workshops they found little useful. During the session, when the group began to understand the process, the mood changed. Eventually, during the evaluation phase, one of the biggest criticists expressed that he found the session useful and proposed to do this another time instead of the other workshops.
- During the endorsements round, there was a much discussion. For example one participant endorsed a former colleague now working in another department. Another group member noticed this and commented that this person had a lot of expertise and was useful back in the day. He had somewhat forgotten about this person. Some catching up about the endorsed person was done and the group member expressed the possibility that he might contact this former colleague for help on the particular knowledge topic. Other examples include the discussion of experiences with an endorsed person on one of the sheets; how the one group member had negative experiences and other good experiences with that person. This discussion leads to a more multidimensional view of the person in question. (Remark that such processes enhance the TMS of the group. This connection of the KNG to theory is discussed later)
- One of the findings in the analysis was that the additionally added knowledge topic had a small number of stickers on it. The group had trouble pointing out knowledgeable persons on this topic. That is, the group turned to the only person in the group who had adequate knowledge on this topic (but is still young and no expert), but he himself was unsure who to go to when he had questions on this topic. This showed the limited pool of knowledge resources the group had on this topic. The manager pointed out that this knowledge topic became more and more important and that this observation underlined the urge to actively search for additional knowledgeable colleagues from other departments/countries.
- One participant acted like he was knowledgeable on a number of the defined knowledge topics, which is in line with his function description. However, he was not endorsed on any topic by his direct colleagues (the other participants). An outspoken discussion did not follow on this observation for obvious sensitivity reasons, but it seemed like a reality check to this person. Arguably, the other participants classified his knowledge level lower than he did himself and/or his social interaction was not found convenient by the others.
- When going over the completed knowledge sheets, the participants in the group with a technical background were surprised by the connections the manager had in different departments in different countries on almost all knowledge topics. They did not realise that the manager had these valuable connections that could be easily accessed via the manager.
- The created person-to-topic network graph was given to the secretary. This secretary is often called by (potential) clients with technical questions. She is then supposed to redirect these calls to the
right persons. However, in practice, usually almost all calls were redirected to one manager, who directed them further. This was the case because the secretary did not know who was knowledgeable on what topics. Now, using this graph, the secretary is able to better redirect the calls and the manager in question spends less time on the phone redirecting callers.

The third group C was a group of 12 employees of an international organisation in the field of energy innovation. One participant was a new manager of the group and the other 11 had different backgrounds in the field of energy innovation. Some of the participants already knew each other well, while others were new to the group. The following items were most notable:

- One goal of this session was for the manager to get an insight in the internal and external knowledge network of the group; who knows what and how these people are connected. This session was a quick and informative way to gain such insights (i.e. build transactive memory) he did not have before the session. The resulted network graphs function as a way to look up this knowledge network later (think of a teacher who makes a map of a new class of students; who sits where, the names, who is friends with whom et cetera).
- It also seemed that the group was unsure what knowledge the manager had or they turned to other more valuable persons, as he was not endorsed on any of the 15 knowledge topics. This indicated that, at least on these 15 topics, the manager was left out the knowledge network. An area to improve.
- No goal or knowledge topics were set up front. This resulted in an interesting debate among the participants on what knowledge is crucial for them, but also led to a longer first round. Some of the participants also acknowledged that having a goal or scope would make the defining of knowledge topics more effective. This, again, showed the importance of settings a goal up front to give more direction.

For an upcoming project with a clearer goal, the group intends to do another KNG. There was also interest from the group in larger scale possibilities for a whole department or even the organisation. The fourth group D was a group consisting of five board members (run by students) from a Dutch organisation that provides consultancy jobs for students and two additional participants. The following observations were made:

- This time even more emphasis was given to the endorsement process and guidelines what resulted in less questions. Some participants were still unsure if they could endorse a person that was already on the knowledge sheet. This may need even more explaining in the next session.
- The group consisted of a close subgroup of the five board members and two somewhat external participants. This was clearly reflected in the network graph (dense cluster of five and two more separate nodes) and the names endorsed.
- The organisation expressed the intention to do another KNG, maybe even on a regular basis. Each half or whole year, the board committee changes (a new group of students take over). This means that the social network developed and used to run the organisation also changes regularly. By registering the social knowledge networks of each committee group, these can be used more easily by future groups. This way, valuable connections and resources do not get lost so easily.

The above described findings illustrate different examples of how the KNG can be valuable to the participants (e.g. the participant who got a reality check of his social position within the group, or the
manager who was new to the group and now got a quick way to get insight in the knowledge network of the group) and external parties (e.g. example of the secretary who now uses the knowledge network graph).

The KNG helps groups to examine their current knowledge network position in relation to set goals. The process of determining such goals and related knowledge topics is already valuable to the group as it requires them to get priorities inline in the interest of the group. The endorsing process asks the participants to prioritize their knowledge resources (known persons) based on knowledge level and reachability. This can, for example, make the person realize that he or she has too limited or potentially biased access to knowledge on that topic; something to work on. The interactions, discussions and overview over the knowledge topics could make a participant more aware of one’s own position in the group, makes more clear what the individual or collective goals and challenges are, opens up new or forgotten reachable knowledge resources (persons) and gives additional background to shared resources. All such factors may add to a more efficient finding of valuable knowledgeable persons and using of relevant knowledge, what may lead to more productive teams.

The fact that most participants find it a useful and enjoyable workshop is also valuable. Otherwise the workshop would likely be less effective and chances are that the group would not partake in a similar workshop again.

4.4 THEORETICAL UNDERPINNING

Previous chapter showed the value of the KNG from a practical perspective. This chapter gives a theoretical underpinning of the KNG.

Transactive memory theory is discussed in section 2.2.2. According to transactive memory theory, group members divide the cognitive labour for their tasks and members specialize in different knowledge domains. Transactive memory systems (TMS) are argued to facilitate fast and coordinated access to deep, specialized knowledge, in order to provide a greater amount of task-relevant expertise to be used for team tasks (Lewis, 2003). Transactive memory is memory that is influenced by knowledge about the memory system of another person. What information a person stores, encodes, and retrieves may be different depending in whether that information is already available from another person’s memory. A transactive memory system describes the active use of transactive memory by two or more persons to cooperatively store, retrieve and communicate information. Transactive memory exists in the mind of an individual, a transactive memory system exists between individuals as a function of their transactive memories. Directory updating (learning who knows what in the group), information allocation (assigning memory items to group members), and retrieval coordination (planning how to find items in a way that takes advantage of who knows what) are factors that influence a groups’ TMSs. A group transactive memory occurs when each member keeps current on who knows what, passes information on a topic to the group’s expert on the topic, and develops a relative sense of who is expert on what among all group members. Empirical results suggest that TMSs indeed increase group performance (Lewis, 2003).

During the entire KNG, but especially during and after the endorsement round, a participant learns about new knowledge resources (e.g. people endorsed by others that he or she did not know before), confirmation that his or her primary knowledge resources are likely a good choice (e.g. if others also endorse that person), disapproval of endorsed persons (e.g. another comments on the endorsed person that he or she had bad experiences with that person), or rediscovering of valuable knowledge resources
(e.g. a lost out of sight colleague that now works in another department). These are some examples, but more can be thought of. All these examples lead to directory updating, information allocation and retrieval coordination changes. For example, new resources may be added to directories or others may be ranked as less valuable. Another example: when a person within the group is endorsed a high number of times on a topic, then this reinforces his or her position within the group as the main source (influences retrieval coordination) and target (influences information allocation) on this topic. See also the examples given before in 4.3. When reading these examples and keeping these three factors in mind, one can often imagine how one or more of the directory updating, information allocation and retrieval coordination factors may be influenced (e.g. access entries within directory updating may occur when the group realises the many accessible valuable resources the manager has). As discussed before in the chapter about transactive memory theory, Wegner (1995) argues that a key aspect of retrieval coordination is the development of the recognition of expertise among group members. This is one of the goals of the KNG. In addition, when experts may not be available within the group, the KNG indicates experts outside the group. The main point is that the KNG is closely related to and for a great part based on transactive memory theory.

The importance of social aspects of knowledge sharing and accessing valuable knowledge resources has been shown in various chapters including the discussions of collective knowledge, transactive memory systems and the knowledge sharing process. Knowing who knows what is a first step, but whether this knowledge can be effectively acquired is another. This is dependent on factors such as accessibility, trust, engagement, language and media richness (see also 2.3.4). The expectations of how a knowledge sharing process will occur (based on such factors and past experiences) influences the intentions of using a particular knowledge resource over another. The KNG incorporates these social aspects. When a participant is asked to endorse persons on one or more knowledge topics, the related questions that he or she should answer are in the line of ‘who would you go to first on this topic?’ or ‘who would you contact first?’ The participant endorses a person based on such social aspects. This is essentially different from asking the question ‘who has the most knowledge on this topic?’ This last question may lead to answers such as ‘Bill Gates’ on a topic of computers, what is a less useful name as he is probably not accessible (unless the participant happens to have a real connection with Bill Gates). Thus, by incorporating such social factors, the endorsed persons are likely to be accessible by others in the group. This makes the mapped social knowledge network (hence the ‘social’) more valuable in practice.

The KNG is a social and active workshop. Sitting behind a computer the whole time on a fixed place limits interactions to only others nearby that are not blocked by computer screens. During the KNG, the participants do not sit behind any computer or laptop and even walk around during the endorsement round. This dynamic leads to more interactions with more persons, what may lead to more TMS improving conversations. Due to these dynamics, participants may experience this workshop more as a group process than would be the case when sitting behind a computer the whole time. Such ‘group learning’ has been argued to improve collective knowledge and TMS (see also section 2.2 Collective Knowledge, Intellectual Capital and TMS), but may also increase ‘team spirit’ (see also 2.3.5). This team spirit, in turn, may lead to more intrinsic motivation. For example for the upcoming project that was the basis for the goal and related knowledge topics of the session.

The KNG may be seen as making TMSs more visible and at the same time changing these TMSs. Making knowledge visible and showing its role to the organisation is argued to be one of the three main goals KM initiatives often have (see section 2.3.1). For the participants, the interactions and discussion are already valuable, but the combination of making it visible by using knowledge sheets and stickers, and created
social network graphs make the KNG even more effective. These visualisations add an additional view on the matter for the participants (besides conversations), but are also suitable to give insight to external parties (e.g. managers, secretaries, other groups/ departments). The KNG provides tangible outcomes what may lead to getting support from management more easily compared to other KM initiatives that lack this. It is argued before (2.3.7) that such support is important for KM to succeed.

The KNG does not try to capture or codify knowledge, but helps people find valuable knowledge resources (persons) or indicates when such resources may be lacking. It also stimulates interpersonal interactions (knowledge sharing) during the session and after the session by primarily endorsing persons. That way tacit knowledge is not excluded. On the contrary, defined knowledge topics can be highly tacit and incorporate needed skills or experience for example. Individual and collective tacit knowledge has been argued to be essential for a competitive advantage, important for innovation and collective tacit knowledge may explain why certain teams or groups are capable of exceptional group performances (see also 2.2.1). Thus, incorporating tacit knowledge subjects and stimulating tacit knowledge sharing is an added value to the KNG.

A first step of the KNG is the defining of knowledge topics. A team usually has shared goals that are in line with the corporate strategy. For such a team, the KNG is a tool to (re)assess the most important goals and related knowledge that is needed to achieve these goals. Not all knowledge is as relevant or important, and not all knowledge can be acquired. Therefore prioritising knowledge is a useful and necessary activity. Crucial knowledge consists of that knowledge that gives the organisation a competitive advantage, strongly related to the core competencies of the organisation (Boersma J., 2002) in (Boer, 2005). The author emphasizes that the more crucial the knowledge is to the organisation, the better managers have to monitor it. This, however, can change over time when for example developments in the market require the organisation to develop new crucial knowledge or to dispose of obsolete knowledge.

In line with this perspective, a team can also be argued to have different levels of knowledge. Crucial knowledge to a team may be seen as that knowledge that leads to performing there tasks and achieving their goals in such a way that ultimately leads to a better competitive advantage of the organisation. This knowledge is strongly related to the core competencies of that particular team, and in a bigger picture to the core competencies of the organisation. The KNG gives insight in the current social knowledge network within and around the participating group based on these crucial knowledge topics. As argued, the crucial knowledge to an organisation can change over time, and so can a team’s crucial knowledge. Therefore, the KNG stays relevant and valuable for a team over time. That is, when the crucial knowledge topics change over time, a new KNG can give new insights in the newly emerged situation. Furthermore, even though the crucial knowledge topics may stay relatively constant, a groups’ population may change, changing the social network within and around the group. Also then, a new KNG may be valuable (e.g. the previously described example of the frequently changing board committee of organisation of test group D).
4.5 COMMERCIAL VALUE TO GURUSCAN

The KNG is an accessible way for groups or organisations to get acquainted with and experience the ideas behind GuruScan in an active way. The participants become familiar with the brand GuruScan and get enthusiastic about the KNG. The KNG itself is already a lucrative product for GuruScan, but it is even better when it also leads to more KNG sessions and possibly a larger scale Expert Guide implementation. The group may act as promoters of the GuruScan concept within the organisation.

The test sessions of the KNG have already proven itself valuable to GuruScan in the sense that new connections with new companies have been made, at least two organisations are planning to do another KNG and participants saw the value of GuruScan on a larger scale. One other company did not do a KNG test, but decided to do 3 GuruScan Team Accelerators.

4.6 IMPROVEMENTS

This chapter proposes different improvements on different aspects of the KNG.

- The knowledge topic defining process can be somewhat undirected and take longer when no goal or selection of knowledge topics have been defined beforehand. It is recommended that at least a goal or scope is thought of and defined before the KNG session. For example, this can be done by discussing it with the group beforehand, or the manager of the group decides. The KNG guide could also incorporate examples of goals set and related knowledge topics of successful KNG sessions.
- An additional guide or framework that helps the process of defining goals and subsequent knowledge topics from, for example, corporate strategy. More research may be done in this subject.
- A short movie demonstrating the steps of the KNG would make the process clearer to potential customers, session leaders and others.
- Evident from the test sessions is that a short KNG to knowledge network graph time adds value in the eyes of the participating group. The process from written texts on the sheets and stickers to a digital file can be improved. A first test with using the Team Accelerator tool to type in the names already showed improved efficiency, however it is not perfect yet. Ideally, one would like to be able to make pictures of the knowledge sheets including the stickers and automatically the written texts and colours/logos are recognized and stored. This is not possible yet. Either way, it is recommended to continue to improve this process.
- The process of creating knowledge network graphs can also be improved. This was initially done using a dedicated software tool that requires importing files and adjusting settings manually. As a side project, a program is written to automate this process. This program imports participants and references .csv files and automatically creates a person-to-person and person-to-topic network. However, the functionality is basic at this moment and many more features can be added to create other types of graphs and show more detailed data. The process of further automating and expanding the knowledge network graph function should be continued.
- Another option to deal with unclear handwriting and unclear names is to let the group leader/manager, who likely knows most of the names, type in the names and topics. This is especially useful when a group executes a KNG on their own and want to create knowledge network graphs. A solution would be a website that leads the user through all the steps to type in
the knowledge topics, participant names, endorsed names and other information. Then network graphs will be created automatically.

- In all four test sessions there were GuruScan employees present, and in all sessions they provided support. To be sure the KNG is also executed in the correct way without any interference from GuruScan, additional test sessions are recommended.
- A nicely designed and branded package for the KNG items would make it more appealing. Especially when a box is shipped to a customer. This package is not designed yet, but limitations regarding maximum shipment sizes have been taken into account when designing the present KNG items. Therefore, creating a package that meets the common national and international shipment dimension limitations is perfectly feasible. It is recommended to develop a suitable and appealing package.
- Examples and tips in the guide that help the reading of social network graphs.

Even though the KNG can be improved in a number of aspects, these improvement are mostly further refinements. The current materials and software tools work and the KNG already showed its value and usefulness in its current form. Especially under guidance of a GuruScan employee or someone else with experience (for example a former participant), the KNG is ready for use. Therefore, the KNG is marketable.
The main results of this study are (1) the GuruScan Knowledge Network Game (KNG), which is grounded in theory and proven in practice, (2) an identification of key KM initiatives that could bring out the value of knowledge and knowledge networks in organisations, and (3) an update of the insights in how KM literature and organisations view and value knowledge, knowledge networks and KM.

Knowledge is a key valuable asset of an organisation and a basis for innovation and sustainable competitive advantage. An aim of KM is to leverage the organisation’s collective knowledge in order to create benefits and success for the organisation. One of the factors that limits the use of available knowledge is that people are often unaware of the knowledge held by others. Mapping knowledge and thereby giving an employee an extended insight in who knows what beyond their direct social network can be valuable. In addition to GuruScan’s Expert Guide and Team Accelerator products a more accessible (no laptops needed, lower price point, can be executed without a person from GuruScan to be there) and more scalable (a stand-alone KNG does not require the presence of a GuruScan employee) product is developed.

The KNG is an active KM workshop that realises some of the desired KM outcomes and overcomes some of the well-known problems. The KNG results in a social expert index and a visualisation of the social knowledge network within and adjacent to the participants group. The KNG has been proven valuable in practice (see section 4.3) and is grounded in theory (see section 4.4). The KNG is a compelling product that overcomes cynicism and laxity (specifically observed during one of the test sessions), and is generally reviewed by the participants as enthralling and useful. The test sessions resulted in at least two organisations planning to do another KNG and participants saw and expressed the value of GuruScan on a larger scale.

The following arguments give a more detailed underpinning of the KNG:

The KNG is a tool to (re)assess the most important goals and related knowledge that is needed to achieve these goals for a team. This is important as not all knowledge is as relevant or important, and not all knowledge can be acquired. The resulting social network graphs can be used as an expert finder index by both participants and external parties such as secretaries (example of one of the test groups). These useful concrete tangible outcomes help to get management support for organising a KNG. These graphs also give an insight in how people are connected with each other. This is valuable if one wants to approach a person he or she does not know. He or she could ask another who is connected to that person to introduce him or her for easier access. Accessibility and other social factors such as trust and expected engagement are incorporated by asking ‘who would you go to first on this topic?’ or ‘who would you contact first?’. Such factors are important for an effective knowledge sharing process. The KNG thus provides a social expert index. In addition, the KNG is also suitable for tacit knowledge topics, as it does not try to capture or codify knowledge, but helps people find valuable knowledge resources (persons) to share knowledge with. This kind of knowledge is especially valuable when innovation, specialist craftwork or years of experience play a role. The KNG is an active workshop where participants walk around during the endorsement round, and where discussions are held in each round. Through these interactions, participants learn about new knowledge resources (e.g. people endorsed by others that they did not know before), confirmation that his or her primary knowledge resources are likely a good choice (e.g. if others also endorse that person and comment on the value of helpfulness of that person), disapproval of endorsed persons (e.g. another comments on the endorsed person that he or she had bad experiences
with that person), or rediscovering of valuable knowledge resources (e.g. a lost out of sight colleague that now works at another location). These examples have been observed during the test sessions. Such interactions help to develop and enhance TMSs which lead to better group performance (Lewis, 2003).

In addition to the KNG, other key KM initiatives that can bring out the value of knowledge and knowledge networks are identified (see in addition Appendix C for more details). The following action points have been proven valuable to organisations (based on KM literature and/or interviewees), however may be differently applicable for each specific organisation.

- **Do implement an expert finder system, especially in a larger organisation. Do not only rely on and assume that employees fill in their own profiles based on intrinsic motivation. External motivation is likely required.**

  The KNG maps knowledge for a group. An organisation-wide expert finder system is also argued potentially valuable by KM literature and interviewees. Most organisations already have such a system in place, however assuming that all (or even enough) employees fill in their own profiles based on intrinsic motivation was not proven successful. That is, example cases from the interviews show that too many people do not fill in their profile. Some out of a lack of motivation, others on purpose to prevent extra questions and work. Therefore, when an organisation wants to implement such an expert finder system, likely more external motivation is needed. This may be in the form of more promotion and/or stricter control by management, at least in the beginning until (potentially) it becomes integrated in the organisational routines. This way the number of filled in profiles is boosted and the system as a whole becomes useful.

- **Do organise events where people come together face-to-face such as CoPs, Knowledge Cafes, mentoring programs or workshops to share knowledge.** Such events allow valuable tacit knowledge to be shared, which is important for creativity and innovation. It might also extend one’s social network to include new and potentially valuable knowledge resources.

- **Do combine KMSs with tacit knowledge supporting initiatives just described. That is, combine an objectification and personalisation strategy.** Implementing only one of them is likely less effective.

- **Do embrace, stimulate and guide initiatives from the workplace.** These initiatives are driven by intrinsically motivated people and may work better than systems thought of in advance.

- **Do incorporate progress interviews with employees on a structural bases and include and assessment of the change of leaving and what impact that would have on the organisation.** These interviews can then be used to track progress (e.g. based on competencies), to offer additional voluntary or mandatory learning trajectories and the ability to start a knowledge retention trajectory (e.g. mentoring, exit interviews) in time when needed.

- **Do organise group learning processes to stimulate team spirit, intrinsic motivation and developing TMSs and valuable collective tacit knowledge.** This can improve group performance, develop hard to imitate collective tacit knowledge, and lead to a better competitive advantage.

- **Do structurally evaluate projects, processes and initiatives.** Lessons learned from these evaluation should be stored and disseminated throughout the organisation to support similar projects, processes and change initiatives in the future. This prevents reinventing of wheels, doing things twice and making the same mistakes. However, this required time, effort and motivation what is often found lacking in practice. Therefore, management should implement such a lessons learned system, offer employees worktime to structurally evaluate, and also control these activities, at least in the beginning until (potentially) it becomes organisational routine.

- **Do implement a system in which the latest processes and procedures within the organisation are described and stored, and give employees easy access to this information and inform them about**
the latest changes. It takes time and effort to find out ‘how things work’, especially when you are new to the organisation. Clear guides would help and decrease search time.

• Do implement a system in which the latest developments within important fields are easy accessible to the employees of the organisation, including recent research publications.

• Do realise that not all knowledge and KM initiatives are as easily measured or have concrete tangible outcomes. However, these initiatives can still be relevant, useful and valuable. Therefore, if possible and desired, it is recommended to build the relationship between the knowledge manager and client (e.g. senior management) on trust instead of only hard concrete results.

• Do, as a knowledge manager, be aware that emphasising and discussing all kinds of perspectives on and different types of knowledge may not add much value in the eyes of a non-knowledge manager.

In addition to these findings, other points of interest have been identified that give an update of how KM literature and organisations view and value knowledge, knowledge networks and KM (see in addition Appendix C for more details). These points of interest are based on differences between KM literature and practice.

One point of interest is that KM literature often sees a person as a member of a larger group in which he or she shares knowledge, but little attention is given to personal knowledge management (PKM); how a person individually learns, structures and applies his or her knowledge. This is also important, because when a person is able to better learn, structure and apply his or her knowledge, then this can also lead to organisational benefits. This PKM is specifically promoted and found successful by one of the interviewees (Person C). It includes mind mapping and Getting Things Done. This PKM is an addition to the common collective-emphasising-KM.

Another point of interest is the identified difference in approach and goal of KM between public and commercial companies. The commercial companies focus on positive business metrics such as profitability, growth rate or other financial figures (risk, compliance, control); KM should always contribute to those. In contrast, the public organisations have a task (and are funded) to be a valuable knowledge resource to both internal and external parties. Here, KM is aimed to support this task of gathering, organising and making knowledge available, also to external parties. One interviewee stated that their ultimate goal is to create benefits for the client, not making high profits (Koman). This organisation aims to accomplish this by using KM to support working with more standardized and scientifically underpinned methods. The identified difference between commercial and public companies was not found in the literature review. It could be a basis for further research on generality and the consequences of such a difference, and is possibly an addition to KM literature.

A third point of interest is that most organisations do incorporate some kind of knowledge retention plan, but these differ in structure (e.g. semi-annual or only at the end of one’s career), who is considered (e.g. all employees or a selection) and how far the knowledge retention plan is developed (e.g. still in early stages, or structurally testing but without a standardized proven plan how to cope with knowledge loss in the case of employees leaving). Another organisation copes with collective aging by replacing manual processes with automated systems. This makes the knowledge held by the retiree’s not needed anymore. However, new IT related knowledge may have to be acquired. These examples indicate that organisations are aware of potential knowledge loss due to leaving employees, but there is no universally knowledge retention plan used. Each organisation uses their own ways.

A fourth point of interest is that employees and management mainly have an insight in ‘who knows what’ and ‘who knows who’ or ‘who collaborates with whom’ through their social network. This is often sufficient to acquire the needed knowledge, however, sometimes this knowledge may not be available
within the social network. Then an expert finder function is helpful in finding additional knowledge sources. However, these systems often do not work sufficiently in practice to be useful (explained earlier). Also, no other systems are in place that could help the employee. Although, KM literature and interviewees argue for such an expert finder system, the current state is that the insight is still limited to the individual social network. This situation may lead to reinventing the wheel or unnecessary hiring of external expertise.

A fifth point of interest is the diversity when it comes to crucial knowledge. If crucial knowledge is pointed out, then it is mostly done by management (Koman; Person B; Person C). Crucial knowledge is connected to the current focus of the organisation and knowledge outside this focus has been overseen (Person B). For one organisation the crucial knowledge is in metrics and visibility is restricted to management (Person C). The distinction between knowledge and crucial knowledge seems too unfamiliar to most interviewees to draw general conclusions on these observations.

These points of interest are an update of the insights in how KM literature and organisations view and value knowledge, knowledge networks and KM.
This study discusses multiple topics related to knowledge management based on a literature review, compared and complemented them with insights from practice based on interviews, and also developed and tested the KNG. In this section, the most noteworthy refinements of the existing literature on knowledge management and recommendations for future research and for GuruScan are given. In addition, the limitations of this study are discussed.

One of the noteworthy findings is the distance between the KM field and the business field, also acknowledged by one of the interviewed knowledge managers with many years of experience (Person B). Within the KM literature, among KM practitioners and others who have a background in KM or are linked to KM, KM is seen as something essential for any organisation. However, outside this ‘KM field’ it seems that people do not rate KM as important. KM is often associated with failed (often IT related) initiatives. Both the KM literature and the interviewees indicate that knowledge managers need to convince people that knowledge sharing and KM is important and knowledge sharing should be something integral to one’s job.

On the other hand, almost every organisation partakes in at least some initiatives that may be seen as KM, for example when someone creates and maintains a folder on the internal network disk with documents of past and current projects, when employees are offered to follow a part time study or follow a training session, or when the coffee area gets better coffee and a redesign with the aim of making employees happier and stimulate short interactions during coffee breaks. The wide variety of subjects and initiatives that can be related to KM (see also Appendix B) may obscure the role of the knowledge manager; he may be seen as a jack-of-all-trades, but expert of none. More research could be done about the perception of KM and the reputation of knowledge managers with ‘outsiders’. This could indicate the biggest hurdles to overcome in an aim for an organisation-wide acknowledgement and support of KM.

Another noteworthy finding is the difference in KM approach and goal between public and commercial organisations based on the interviews. Commercial organisations see positive business metrics as highly important, and KM should always contribute to those. Public organisations may have a task (and are funded) to be a valuable knowledge resource to both internal and external parties. Here, KM is aimed to support this task of gathering, organising and making knowledge available, also to external parties. I suspect that these two aims have different influences on how KM is perceived and conducted in an organisation. In an organisation that is constantly focussed on making profit, increasing market share, satisfying many commercial stakeholders and therefore focus on such hard business metrics, there may be an expectancy and strict justification required of every activity conducted to clearly contribute to these business results, possibly with short term deadlines. In such a culture it is imaginable that the number of KM initiatives is more limited and the initiatives are more focussed on concrete results, such as IT systems. A public organisation that is funded and has a task to be a valuable knowledge resource may be less strict on requiring hard and fast results on all initiatives. That gives more freedom and space for KM initiatives such as knowledge sharing days, inspiration talks, Knowledge Cafes, CoPs and workshops. Further research could be done about the differences in KM between commercial and public organisations. Including the reputation and freedom of a KM department and about the effectiveness and successes of KM initiatives. Further, most KM literature seem to have competitive commercial organisations in mind, and not so much public organisations. More insights in KM in public organisation could enrich KM literature.
Most KM literature holds a collective-perspective that sees a person as a member of a collective and less as an individual. This is also stated by one of the interviewed knowledge managers (Person B). Topics often involve multiple persons and knowledge sharing between those persons, and are aimed for the collective benefits for the organisation. However, in addition to this collective-emphasising-KM, personal knowledge management should also be more acknowledged as a part of KM, as persons also learn and create knowledge on their own. When a person is better able to keep overview of his work, to better structure his or her knowledge, then this can also lead to benefits for the organisation as a whole. If methods such as mind mapping and Getting Things Done help an individual to better learn and use his knowledge to the benefits of the organisation, then they can be seen as KM.

A fourth notable finding from the interviews is that expert finding systems often do not work as intended. This is because too many employees do not fill in their profiles based on motivational grounds. Some may be lax, others may not fill in their profile on purpose, even though they see the potential of the system for the organisation as a whole (Person C). It is unlikely that an expert finder system will ever include filled in profiles of all employees when such motivational issues play a role by employees. One option could be to increase external motivation on employees to fill in their profile. Opinions differ whether such an approach is potentially good (Person C) or bad (Koman). I would argue to at least first try options where employees are positively stimulated but not forced. Further, it seems in practice there is a practical maximum and minimum amount of filled in profiles. This maximum could be seen as the highest number of filled in profiles likely possible without forcing employees. A minimum could be the number of filled in profiles needed for the system to be broadly useful for what it is intended. In all organisations from the interviews this minimum is apparently not met. More research could be done about such maxima and minima. Could such boundaries maybe be used as indicators for successful expert finder systems? This may also include the question: if this minimum is met, when is then an expert finder system considered a success? This will also depend on the usage by employees given that the number of filled in profiles is high enough.

The GuruScan Expert Guide has an advantage compared to these ‘traditional’ expert finder systems in which each employee must fill in their own profile. Because the Expert Guide works with endorsing others (just as the KNG) instead of filling in one’s own profile, profiles of people that are not active can be created. Therefore, only a smaller group is needed to endorse a large number of colleagues on knowledge topics. This can create a far greater number of filled in profiles than is otherwise possible in the traditional expert systems. GuruScan has experienced that a participation grade of approximately 65% leads to a coverage of knowledge profiles of 95%. Such a situation seems present in one of the interviewees’ organisation (Koman) and potentially other organisations. That is, there seems a smaller group of intrinsically motivated people related to the CoPs who are willing to actively participate. They could cover a large part of the profiles if they would use GuruScan. This key difference between GuruScan’s Expert Guide and other expert finder systems should be even more emphasized when promoting the GuruScan Expert Guide to potential customers.

Focussing on the developed KNG. The KNG is theoretically underpinned and the test sessions have shown different examples of how the KNG and its outcomes are useful for participants and external parties. However, in practice, there are many human and other factors that determine whether the outcomes and effects of the KNG come close to what is aimed for. For example, a participant can deliberately withhold valuable knowledge resources so that he stays the groups’ expert on that topic, or endorse a groupmate on a topic out of social reasons. Also, participants can be unmotivated or influential to others. Therefore, the effects, outcomes and usefulness of these outcomes may vary between different sessions, group and
individuals. That said, one of the most essential aspects for the success of a new product is proven optimistic: the participants are positive and find it useful (even an unmotivated and sceptic participant comes around and proposes another session). The fact that the client (in this case the participants and possibly external persons) finds the KNG useful is enough justification for some organisations (Person B). Further, if participants from the workplace find the KNG useful, are excited and want to go through in this direction of mapping more knowledge networks, then management should embrace and support this. In line with one interviewee (Koman); initiatives set up from the workplace often work better than systems thought of in advance. If indeed participants want to go through in this direction, then the organisation has a project that is based on intrinsically motivated employees from the workplace; an important stimulating factor for KM. In addition, GuruScan presumably gets more business in the form of more KNG sessions or potentially a similar method on a larger scale: Team Accelerator or Expert Guide. Thus, enthusiastic employees are valuable for both the organisation and GuruScan. In contrast, when participants find the KNG useless or do not like the workshop, then this could harm the brand GuruScan and its options for future sales to that organisation. Based on the test sessions and the already planned additional KNG sessions, however, I see the KNG as a success. I recommended GuruScan to continue with the KNG (See section 4.6). This includes further testing of the KNG when performed by an employee stand-alone, finalising product designs, and extending and improving network visualisations.

Limitations

This study includes a literature review, interviews, product development and test sessions in a period of six months. This means that time is limited for these activities. Four interviews and four KNG test sessions are conducted. This limited number of these activities limit the possibility to make general conclusions. This study is explorative in nature and can function as a basis for future research.

Knowledge management is a broad field with many related topics. A selection of most common topics is included and discussed. Topics not or limitedly included are for example: language, communication, technical aspects of IT systems and implementations, social media, e-learning, groupware, intranet, video conferences, and more. Also not going into detail about graph theory including clusters, betweenness, degrees of nodes, boundary spanners, and shortest path algorithms for example. There is only so much that can be discussed and researched in such a limited timeframe.

Possible personal limitations come from the fact that I had no experience in the field of KM before starting this master thesis project. Most topics were new to me and I also had little previous job experience. Therefore, my knowledge about KM is mostly based on literature and based on others’ experiences and what they have told me (e.g. interviews, test sessions, employees of GuruScan, friends et cetera). This limits my view on KM as I am not able to speak much from own experiences. On the other hand, this lack of experience in practice may support a less prejudiced view on the matter.

My education and experience in product design was not a limitation. Contrary, it helped the development process of the KNG significantly.
REFERENCES


APPENDIX A. INTERVIEW WITH R. KOMAN OF KONINKLIJKE VISIO (IN DUTCH)

Interview samenvatting. Tekst tussen rechte haken en cursief [voorbeeld] zijn toegevoegd voor meer structuur. Ook is er extra informatie toegevoegd aan de hand van de bronnen die de geënterviewde aangaf.

- Koninklijke Visio is een expertisecentrum voor slechtziende en blinde mensen met ruim 3000 medewerkers verdeeld over verschillende locaties in Nederland.
- Ruben Koman is Adviseur Kennis binnen de afdeling Kennis Expertise en Innovatie (KEI) van Koninklijke Visio.

Nick: Wat is uw achtergrond en welke ervaring heeft u met kennismanagement?

[Studie] Ik heb Informatiedienstverlening en -management gestudeerd en ben in 2001 afgestudeerd op het gebied van kennismanagement (KM). Binnen de opleiding gaat het om het structureren van informatie, waarbij IT een van de facetten is die de informatie- en km-processen ondersteunen (content en toegankelijkheid). Daarnaast zijn ook de communicatieve aspecten van belang. KM draait niet alleen om systemen maar ook mensen in beweging brengen.

[Koninklijke Visio] Koninklijke Visio is een expertisecentrum. Onder meer vanuit het ministerie van VWS (Volksgezondheid, Welzijn en Sport) is er geld beschikbaar zodat wij ervoor kunnen zorgen dat kennis vanuit de sector beschikbaar is zowel binnen als buiten de organisatie. Binnen Koninklijke Visio ben ik werkzaam op de afdeling kennis expertise en innovatie (KEI). Deze afdeling is verantwoordelijk voor het kennismanagement binnen de organisatie.

Koman’s visie op kennismanagement binnen Koninklijke Visio. Gebaseerd op aangereikte presentatie van Koman. [bron: https://prezi.com/z-ccxp567jya/visie-op-kennismanagement/]

Koninklijke Visio maakt als volgt onderscheid tussen impliciete en expliciete kennis: Impliciete kennis zit in het hoofd en expliciete kennis is dat wat op papier staat of in systemen zit. Als onderdeel van KM wordt het ontwikkelen van vaardigheden van medewerkers en het vastleggen en verspreiden van informatie gezien.

Kennis is een combinatie van informatie, ervaring, vaardigheden en attitude (K = I x EVA).

Koninklijke Visio werkt op basis van de kenniscirkel. Dit om een zo hoog mogelijk niveau te krijgen en bestaande kennis efficiënt te benutten.

De kenniscirkel wordt als volgt toegepast voor Koninklijke Visio:

2. Bewerken: kennis expliciet maken (faciliteren), verzamelen, vastleggen.
4. Implementeren: implementatieprojecten.
5. Toepassen: primaire proces/lijn, KEI-projecten, Academie, internationale projecten, O&I.
6. Evalueren: cliënt en professional, professional en KEI (antennefunctie), meten en leren van KM, wetenschappelijk onderzoek, eigen data-analyses, pilot onderzoek etc.
7. Programmeren: de strategie van Koninklijke Visio jaarplannen
8. Weer naar stap 1.

Als taken van kennismanagement worden onderscheiden:
• Awareness: vaststellen en inventariseren van huidige en toekomstige relevante kennis, om (project)doelen te halen, problemen op te lossen en bewust te zijn van een mogelijke kenniskloof tussen huidige kennis en noodzakelijke kennis.
• Verwerving (acquireren): kennis van buiten de organisatie naar binnen halen.
• Transfer: kennis van binnen de organisatie naar buiten brengen (doorwerking) en kennisuitwisseling tussen organisaties onderling (kennisnetwerken).
• Exploitatie: verkopen van kennis (producten).

Verder wordt elke medewerker als kenniswerker gezien en doet elke afdeling in zeker zin aan kennismanagement. Elke medewerker binnen Koninklijke Visio doet nieuwe kennis op en is verantwoordelijk deze kennis aan collega’s over te brengen. Zelfredzaamheid/eigen regie wordt hierbij gepropageerd.

Het wordt aanbevolen om binnen Koninklijke Visio vaker te zoeken naar positieve ‘energiehaarden’ in de organisatie (de ‘best persons’): die mensen die net dat stapje extra doen, die altijd enthousiast zijn.

Binnen Koninklijke Visio worden onder andere de volgende instrumenten aangeboden en gebruikt om kennis te halen, te verspreiden en te borgen:

<table>
<thead>
<tr>
<th>KM instrumenten binnen Koninklijke Visio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intranet (gebaseerd op Sharepoint) - Uitgelicht - Teamsites - Wie-is-wie (kenniskaart, professional page) - Knowledge base (expertiseplein, toekomstig literatuur plein) - Kwaliteitshandboek Methodenboek</td>
</tr>
<tr>
<td>Projecten - Nationale projecten - Internationale projecten - Projecten Koninklijke Visio international</td>
</tr>
<tr>
<td>CoP (Communities of Practice) - Expertisegroep - Vakgroep - Kennisgroep - Etc.</td>
</tr>
<tr>
<td>Kennisbijeenkomst - Kennisdeeldag van expertisegroep - Kennisdeeldag uit initiatief van locatie - Kennisdeeldag uit initiatief van KEI - Digitaal netwerken - Netwerken op LinkedIn, Twitter en Facebook</td>
</tr>
<tr>
<td>Genoemd in interview - Inspiration shops - Prijsvragen - Academie - Symposia, congressen - Exit gesprekken (nog in kinderschoenen) - Gepensioneerde club Visioen - Architecture (Visio het Loo Erf) - Gesprekkencyclus met manager (POP)</td>
</tr>
</tbody>
</table>

De onderwerpen in deze kenniscirkel komen later nog aan bod.

Alle medewerkers passen kennis uit deze categorieën toe en dragen ook bij aan deze categorieën. Adviseurs Kennis evalueren en structureren kennis uit deze categorieën en voegen deze vervolgens weer toe.

De (theoretische) rol Adviseur Kennis op basis van kennisproces houdt in:

• Houdt overzicht in kennisontwikkeling en kennishiaten.
• Creëert kennisproductieve omgeving. Met gebruik van KM instrumenten zoals een sociaal intranet, methodenboek, kennisdeeldagen en kenniswerkers opleiden.
Monitort Communities of Practice (CoP’s): de voortgang van CoP’s (zoals expertise en vakgroepen), komen speerpunten van Koninklijke Visio overeen met de jaarplannen en jaarplanning domeinen?

Geeft richtlijnen met betrekking tot speerpunten kennismanagement aan jaaropdrachten van de CoP’s.

Verbindt/maakt kennis uitwisseling en borging mogelijk tussen KEI afdelingen.

Schrijft evaluaties en adviesrapporten met betrekking tot voortgang CoP’s, mogelijkheden voor kennisproducten, constatering kennishiaten voor directeur KEI en BDO.

Als essentiële randvoorwaarden worden gezien:

- Dat er voldoende financiële middelen beschikbaar zijn.
- Dat er tijd voor kennisdelen aan medewerkers beschikbaar wordt gesteld
- Dat er een cultuur/attitude is, ook in de top van de organisatie, waarin er een wil is om kennis te delen en samen te werken.
- Een goede technische infrastructuur om digitaal kennis te kunnen delen.
- Het kunnen uitzetten van een traject waardoor educatie (kennis digitaal leren delen) van alle medewerkers mogelijk wordt.

**Interview**

**[Sharepoint, Kenniskaarten, connectie met HRM]** Voor kennismanagement hebben we bepaalde systemen draaien, voornamelijk de Microsoft Sharepoint omgeving voor het intranet. In projecten gebruiken we CMS (Content Management System) systemen als Kentico. Binnen Sharepoint is het mogelijk om op allerlei manieren metadata te koppelen aan medewerkers en om kenniskaarten te installeren (soort wie is wie; om er achter te komen wie in de organisatie waar mee bezig is).

In de toekomst hopen we dit in relatie met de HRM afdeling op te zetten, omdat zij al een HR systeem hebben welke we proberen te koppelen aan Sharepoint. Hierdoor is een deel van de informatie van de medewerkers al direct beschikbaar. En de werknemers moeten het gaan invullen. Want wat je vaak merkt; als medewerkers extra velden moeten gaan invullen zitten ze daar meestal niet op de wachten. Dus we hebben ervoor gezorgd dat er echt een combinatie is tussen reeds beschikbare systemen die sowieso ingevuld moeten worden vanuit HRA (Human Resource Administratie) en de systemen waarin wij graag extra informatie zien van de medewerker zodat daarin goed kan worden gezocht. Zodat we ook kunnen weten wie dan de experts zijn op een bepaald gebied.

**[CoP en Projecten, project als uitkomst van KM]** Naast de digitale systemen hebben we ook CoP’s (Communities of Practice). Dit is binnen KM een veelgebruikte vorm, een soort werkgroep waar mensen van een bepaald expertisegebied bij elkaar komen. Binnen Koninklijke Visio hebben wij een aantal aandachtgebieden; speerpunten. Die gaan over de onderwerpen die heel erg belangrijk zijn voor onze cliënt. Bijvoorbeeld visueel verstandelijke beperking, aangeboren hersenletsel, psychosociaal, tactiele waarneming en braille. Om die onderwerpen hebben we CoP’s georganiseerd. Daar zitten mensen zoals ik bij; ik ben een adviseur kennis, adviseur op het gebied van KM. Dus hoe zorgen we dat binnen die groepen kennis op een goede manier wordt gedeeld en dat kennis van die groepen weer door wordt gesluisd naar de hele organisatie. Daar zitten ook projectleiders tussen die helpen om bepaalde initiatieven te maken tot projecten. Tenminste als de CoP’s zien dat bepaalde onderwerpen nodig zijn om uit te diepen en bijvoorbeeld tot een project te laten maken. Projecten zou je dus kunnen zien als een idee, een vorm, waarop KM uiteindelijk een tastbaar resultaat wordt: als (o.a. door de CoP) blijkt dat bepaalde ideeën van
De werkvloer verder moeten worden uitgewerkt en daar komt een project uit voort, dan kan je dat project als resultaat zien van KM.

[Expertiseplein, literatuurplein] We hebben ook een Expertiseplein op het intranet. Dat is een van de middelen om onze kennis en expertise te laten zien op een aantal themagebieden: Algemeen, Mobilitiet, OTC, Functies/stoornissen, Participatie en Welzijn. Daarnaast komt er ook nog een literatuurplein waar onder andere wetenschappelijke publicaties en digitale tijdschriften te vinden zijn, en een centrale multimeadiaopslag van films en foto’s. [bron: https://prezi.com/cgq_ghsxw23t/intranet-als-instrument-om-kennis-te-delen/ ]


Daarnaast proberen we op heel veel andere manieren initiatieven vanaf de werkvloer aan te wakkeren. Hierbij maken we gebruik van allerlei verschillende communicatie middelen. Bijvoorbeeld door berichten te plaatsen op Uitgelicht (nieuwsberichten binnen intranet), door het verspreiden van informatiebulletins, of bijvoorbeeld door mensen een podium te geven (soort TED-talks). Op deze manier hopen proberen we de kennis van medewerkers te verspreiden.

[(Huidige situatie) Kenniskaarten in Sharepoint 2007 te beperkt (gebruikt) en wisselend ingevuld] We gebruiken op dit moment Sharepoint 2007 en daarin maken we gebruik van de people search. Die komt tot uiting aan de voorkant als wie-is-wie, als een soort gouden gids. Wie-is-wie geeft de mogelijkheid om te zoeken op voornaam, achternaam, functie, de afdeling/domein waar hij/zij werkt en de standplaats (op welke locatie) waar die collega werkt. Dit is nog heel beperkt; stel je zoekt op een persoon op wie-is-wie. Je vindt dan de naam, functie, afdeling, standplaats, telefoon/mobiele nummer, email adres, welke werkdagen hij/zij werkt, verjaardag, levensmotto en een kopje ‘kennis en ervaring’, hierin kunnen mensen van alles kwijt wat ze willen.

In de praktijk wordt wie-is-wie voornamelijk gebruikt om email adressen en telefoonnummers te traceren. Binnen Koninklijke Visio wordt het invullen van het stukje ‘kennis en ervaring’ erg vrij gelaten. Hierdoor wordt dit niet door iedereen ingevuld en is er helaas maar weinig inzicht van wie er binnen de organisatie waar mee bezig is.


De nieuwe kenniskaarten binnen Sharepoint 2013 komen er zo uit te zien [bron: https://prezi.com/cgq_ghsxw23t/intranet-als-instrument-om-kennis-te-delen/ ]:
- Foto; Naam; -Functienaam
- Afdeling/domein; -Standplaats/locatie
- Vaste telefoon werk; -Mobiele telefoon werk
- E-mailadres; -Werkdagen; -Verjaardag
- Vakkennis
- Deelname expertise- kennis-, vakgroepen (heden;verleden) [CoP]
Deelname Koninklijke Visio-projecten (heden; verleden)
- Koninklijke Visio-publicaties; Overige publicaties
- Yammer; -LinkedIn; -Facebook
- Trots op (binnen Koninklijke Visio)

[Kenniskaarten gedeeltelijk automatisch ingevuld vanuit HRA en gedeeltelijk vrijwillig] We hopen dus dat, omdat je al betrokken bent bij die CoP, dat als je dat gaat invullen en het zo veel duidelijker wordt waar jouw kennis en ervaring zit. Op die manier proberen we dat te bevorderen. De meeste gegevens komen hier al uit het HRA systeem en dat was in de oude versie nog niet het geval. In de nieuwe versie van Sharepoint willen we dat binnenkort gaan koppelen. We gaan namelijk ook over op een nieuwe HRM systeem en we vonden het tijd om direct die gegevens van het nieuwe HRM systeem aan de kenniskaarten van Sharepoint te koppelen. Zodat dat van elkaar gebruik kunnen maken.

Nick: Worden mensen straks verplicht gesteld om eens in de zoveel tijd hun profiel up te daten/ in te vullen?

[Thema ‘Eigen regie’. Geen verplichting tot invullen/updaten profiel] Nee. Binnen de zorg leeft op dit moment heel erg het thema ‘eigen regie’. Dat geldt voor de cliënt, maar ook voor de medewerker. Het is daarnaast een maatschappelijke trend, net als het nieuwe werken. Dat houdt in dat je, in overleg met je manager, zelf bepaalt wat je deelt en waar je aan mee doet. Wij gaan er heel erg vanuit dat mensen toch intrinsiek gemotiveerd moeten zijn om kennis te delen. Het is zo dat bepaalde zaken verplicht moeten worden ingevuld binnen het HRM systeem, anders krijg je bijvoorbeeld geen salaris. Dat is een mooie stok achter de deur. Vandaar dat we ook gebruik willen maken van het HRM systeem in de nieuwe situatie. En voor de andere zaken: als jij al betrokken bent bij de CoP’s (expertise- kennis-, vakgroepen), dan behoor je vaak als tot de groep die graag kennis wil delen. Dus dan zal je dat ook vaker informatie op die kenniskaart toe gaan voegen. Dat zijn de kansen. In dat inderdaad geen verplichte vakken. We werken ook niet a la de oude Hyves; een social media site waarbij je een foto had van Bassie (de clown) en zolang je de foto niet veranderde bleef je Bassie. Dat is ook een soort van hoop dat mensen hun foto gingen veranderen omdat ze niet meer Bassie wilde zijn. Dat zijn mogelijkheden om iemand op een zachte wijze te dwingen, maar dat gaan wij toch zo min mogelijk doen. Wij hopen enkel met die HR link dat het automatisch veel meer gaat ontstaan en het delen kom vanuit intrinsieke motivatie.

Nick: Wat ziet u als belangrijkste doel of uitkomst van KM?

[Geen KM doen omdat je het zou moeten doen] Het is zo dat KM lange tijd een hype is geweest en misschien in sommige opzichten nog wel is. Als mensen het toepassen omdat je KM zou moeten toepassen slaat dat een beetje het doel voorbij. Wij gaan geen KM doen omdat je KM zou moeten doen.

[Twee hoofdredenen waarom Koninklijke Visio aan KM doet] Wij doen enerzijds aan KM omdat de overheid van ons vraagt om onze kennis te delen en anderzijds omdat wijzelf willen dat er op gestandaardiseerde manieren wordt gedacht en gewerkt en kennis wordt gedeeld. Dat wil zeggen dat wij steeds wetenschappelijker gaan werken (steeds hoger op de ‘effectladder’ (die aangeeft: de mate van wetenschappelijkheid)), opdat de cliënt hier uiteindelijk baat bij heeft.

[Vraag vanuit overheid om kennis te delen, expertisecentrum te zijn] Binnen het ministerie van VWS is gezegd: Koninklijke Visio, jullie zijn een klein gebied binnen de gezondheidssector, eigenlijk een niche in de markt. Er zijn maar een X aantal partijen die werk doen op het gebied van [...] en er zijn geen specifieke onderzoeksinstellingen die daar verder onderzoek naar doen. Jullie zijn dus de aangewezen
kennispartners. Dan spreek ik over Koninklijke Visio en aan aantal andere partijen die zich daar mee bezighouden (Bartiméus, Kentalis, Robbert Coppes e.a.).

[KM noodzakelijk voor: kennis laten stromen, van elkaar leren, meer op een gestandaardiseerde/wetenschappelijke manier werken] Wil je inderdaad dat andere organisaties (denk aan de ouderenzorg en andere zorginstellingen) en ook onze eigen mensen baat hebben bij jouw kennis, dan is KM noodzakelijk. We zijn een organisatie met meer dan 3000 medewerkers en duizenden cliënten. Willen deze van elkaars kennis op de hoogte zijn en van elkaar leren, dan moet je die kennis laten stromen. Zeker met zo’n grote organisatie (we komen uit een fusie van een aantal jaren geleden vanuit meerdere organisaties, die bestaat uit allemaal losse stukjes door het land heen). Wil je dat we met elkaar toch op bepaalde standaarden gaan werken, op gestandaardiseerde manieren en wil je van elkaar leren, zodat de cliënt dit uiteindelijk merkt ‘aan het bed’, dan is KM absoluut noodzakelijk.

[Wetenschappelijker gaan werken vereist het delen van kennis en manieren van werken] Stel dat je op de werkvloer iets verzint en dat is zinvol en dat werkt waarschijnlijk goed voor de cliënt. Wil je echter dat wij op de effectladder verschuiven naar steeds wetenschappelijker, dan moet je met elkaar bepaalde vormen van kennisdelen toepassen en dan moet je ook bepaalde manieren van werken met elkaar gaan delen en afspreken. Bijvoorbeeld hoe je koffie zet, dat hoeft niet op 85 verschillende manieren, dat kunnen we op 1 of meerdere manieren met elkaar afspreken van ‘dit zijn dé goede manieren om een cliënt aan te leren hoe hij zelf koffie kan zetten’. Die manieren kunnen we met elkaar delen en in systemen zetten. Wij gebruiken daar bijvoorbeeld het methodenboek voor. Hierin staan methodieken, handelwijzen en middelen opgeslagen. En voor zo’n grote organisatie is KM dan van enorm belang.

[Juist voor grote(re) organisaties is KM en zijn KM systemen van enorme toegevoegde waarde] Ik heb KM in het verleden ook wel eens toegepast bij kleine organisaties, dan merk je dat die grote systemen helemaal niet nodig zijn. Dan is het makkelijker om bijvoorbeeld een notitieboekje/Excelbestand te hebben zodat je weet waar iedereen zit, en wat hun taken en verantwoordelijkheden zijn. Dan heb je dure, geautomatiseerde en geïntegreerde systemen helemaal niet nodig. Maar bij de grote organisaties (zoals ING, Shell, of onze Koninklijke Visio) werkt het gewoon goed. Daar merk je dat IT-systemen voor de toepassing van KM een toegevoegde waarde is om ervoor te zorgen dat medewerkers beter kennis delen, je werkzaamheden op een goed niveau krijgt, dat er meer uniform wordt gewerkt en dat de kwaliteit hierdoor op een goed niveau blijft.

[Projecten op het gebied van onderwijs, revalidatie en advies en wonen en dagbesteding, met als doel 'verbeteren van werkzaamheden (uniforme standaarden)' en als einddoel 'cliënt wordt beter uitgerust']
Op een gegeven moment kom je erachter als organisatie, zeker als je met KM bezig bent, dat bepaalde zaken beter kunnen. Op basis van die gegevens kun je dan een project opstarten met als doel de werkzaamheden verbeteren, opdat de cliënt dit merkt. Met verbeteren bedoel ik dat er een X aantal uniforme standaarden uit gaan komen. We hebben projecten binnen een heel breed scala aan onderwerpen, maar waar het uiteindelijk om gaat is dat de cliënt gaat merken, in zijn dagelijkse woning, dagbesteding, revalidatieadvies of in het onderwijs, dat hij door Koninklijke Visio beter wordt uitgerust als het ware. Dat kan op het gebied van onderwijs, revalidatie en advies en op het gebied van wonen zijn. De projecten hebben altijd het doel om die drie domeinen te verbeteren.

Nick: Ik ben benieuwd naar een heel praktisch voorbeeld binnen één van die projecten. Wellicht dat er op strategisch hoog niveau is bedacht ‘we willen die richting op’, daarna is bedacht ‘we hebben er dit en dit voor nodig’ en uiteindelijk zien we in de praktijk, waar de werknemer met de cliënt werkt, ‘hieraan zien we dat het echt heeft geholpen’.
[Methodieken 'specialistische zorg' en 'eigen initiatief model' als uitkomst van project] Je merkt als organisatie: we willen dat de cliënt steeds meer zelf gaat doen. Dus in die eigen regie gaat staan. We merken op de werkvloer bij het verzamelen van methodieken dat bepaalde methodieken werken. Bijvoorbeeld de methodiek 'specialistische zorg', of de methodiek 'het eigen initiatief model'. Die methodieken zijn uiteindelijk de uitkomst geweest van een project. We hebben gemerkt dat er bepaalde middelen zijn die goed werken om de cliënt steeds meer in zijn eigen kracht te zetten, om de cliënt steeds meer zelf bepaalde zaken te laten regelen in plaats van 'schoolse' hulp te krijgen van medewerkers van Koninklijke Visio. Die methodieken zijn uitkomsten van projecten.

[Methodieken opgeslagen in methodenboek] We hebben uiteindelijk die methodieken ook nog eens opgeslagen in het methodenboek. Medewerkers kunnen daar methodieken vinden om deze vervolgens toe te gaan passen en ervan te leren. En ook om hun kennis over de methodieken te delen. Ook kunnen ze aangeven dat er wellicht aan een bepaalde methodiek gesleuteld moet worden als ze merken dat het in de praktijk nog beter kan of dat de methodiek samen met een instelling of wetenschappelijk instituut nog meer zou moeten worden gevalideerd. Het is een streven de methodiek op een hoger niveau (hoger op de 'effectladder') te zetten. Dat zijn voorbeelden, de methodiek 'specialistische zorg' en de methodiek 'het eigen initiatief model', welke uiteindelijk uitkomsten zijn van projecten en welke er uiteindelijk toe hebben geleid dat de cliënt meer de eigen regie heeft over zijn leven.

Nick: en die projecten vallen dan onder de noemer KM?

[Projectmanagement is middel van KM. En KM is onderdeel van projectmanagement] Ja, er is gebleken dat in het veld dat daar tekort aan was, dit is dus een uitkomst. Dan is projectmanagement een middel van KM, dan is KM een onderdeel daarvan.

Nick: Dus van bovenaf worden initiatieven als Sharepoint, HRM en de connectie ertussen naar de werknemers toe geïntroduceerd en van onderaf (aangejaagd door medewerkers 'van de werkvloer') wordt gekeken naar hoe werknemers in de praktijk bepaalde dingen doen en daar worden de beste manieren van opgeslagen.

[Hoewel ook KM initiatieven vanuit management, zoveel mogelijk regie bij het werkveld] Je hebt bepaalde middelen die worden ingezet door ons om het kennisdelen te bevorderen, maar we proberen om zoveel mogelijk de regie bij het werkveld te leggen. Vandaar ook die CoP’s. Uiteindelijk zijn het de medewerkers van de werkvloer zelf die bepalen waar een tekort aan is of waar een verbeterslag nodig is.

Nick: Zijn er naast de CoP’s nog meer van dat soort initiatieven?


Dat zijn zaken die je ook wilt bevorderen. Je ziet op bepaalde locaties van bedrijven als Vodafone en Google dat mensen daar de ruimte krijgen, omdat de huisarchitectuur uitlokt om mensen bij elkaar te zetten om kennis te delen. Ook wij proberen dat wel te bevorderen door te zorgen dat mensen maar regelmatig bij elkaar komen. En dat kan zijn door de symposia/congressen, door de academie waar je leert, maar inderdaad ook gewoon de koffiemomenten. Dat zijn de informeleren manieren.

Nick: De scholing en symposia zijn echt vanuit Koninklijke Visio opgezet, en de koffiemomenten, je kan misschien betere koffie aanbieden of de ruimte wat aantrekkelijker maken. Wordt er ook op die manier iets mee gedaan?


[KM gaat vooral om de mensen op de werkvloer: initiatieven die er al zijn laten bloeien] Jij hebt het over KM en KM toepassen, in principe doen heel veel organisaties dat dus ook al. Je moet proberen de initiatieven die er al zijn vooral te laten bloeien. Het gaat eigenlijk vooral om de mensen op de werkvloer. Dat is vooral wat wij propageren: dat initiatieven die zelf worden opgezet beter zijn dan allerlei systemen die je van te voren bedenkt. Als er initiatieven zijn van de werkvloer, dan kunnen wij daar de regie in proberen te voeren of processen in te gaan begeleiden zodat hun idee beter kan worden uitgezet. Bijvoorbeeld als zij niet goed op de hoogte van hoe je een project leidt en dan leveren wij projectleiders.

Nick: En hoe komen jullie erachter welke initiatieven er zijn of welke vragen er zijn?

[Op de hoogte van initiatieven: via expertisegroepen, direct naar KEI] Wij (afdeling KEI) zijn de voelsprieten van onze organisatie. Het kan dat mensen de expertisegroepen (cop’s) aanschieten, dat we op die manier, via die groepen, erachter komen waar de initiatieven zijn. Maar ook direct: omdat mensen weten wat binnen KEI, binnen dat domein, gebeurt en daar automatisch op afstappen om te zeggen 'ik heb een idee'.

[Initiatieven/kennisdeling uitlokken: prijsvragen, inspiration shops] We proberen dat ook wel uit te lokken door onze inspiration shops (vergelijkbaar met de ted-talks). We hebben een moment waar mensen op video de mogelijkheid krijgen om hun ideeën te etaleren. Op dat moment hebben ze letterlijk een podium en kunnen ze op video hun ideeën uitten. Soms zijn er ook wel eens mogelijkheden om met een prijsvraag ideeën uit te lokken. En dan zijn wij als KEI de partij om dan die mensen te begeleiden in de processen en in de projecten. Dat zijn ook middelen om ervoor te zorgen dat mensen kennis gaan delen.

[Voorkomen dat er een ‘opgelegd’ idee ontstaat] De inspiration shop filmpjes zijn echt gemaakt door mensen van de werkvloer. Ze hoeven niet ‘gelikt’ te zijn als het maar van de werkvloer is, want als mensen van de werkvloer merken ‘dit is opgelegd’ dan ontstaat er vaak een weerstand. Dus liever iets van de werkvloer wat minder perfect is afgewerkt, dan dat het idee ontstaat dat het door ons opgelegd is en toch niet gebruikt wordt, want dan slaat het zijn doel weer voorbij.
Nick: Jullie gebruiken dus vele verschillende manieren/middelen. Merkt u nog verschillen in deelnemers van bijvoorbeeld zo’n inspiration shop? Ik kan mij voorstellen dat zo’n inspiration shop misschien eerder door jongere medewerkers enthousiast vanuit henzelf wordt gedaan dan oudere medewerkers...

[CoP/Inspiration shop deelname niet leeftijdgebonden] Nee dat valt heel erg mee. Wij hebben het afgelopen jaar geïntroduceerd, van ‘joh, wie wil het toneel hebben waardoor andere medewerkers inspiratie kunnen opdoen?’. Het is eigenlijk een soort van Ted talk. Mensen die daar aan mee gingen doen waren van jong tot oud. Dat merk je ook binnen de expertisegroepen (CoP): wij merken dat het niet leeftijdgebonden is maar, dat het veel meer gaat om mensen die vanuit intrinsieke motivatie kennis willen delen.


[Pas op voor overbelasting energiehaarden] Je moet wel oppassen dat ze niet overbelast raken. Dat is vaak bij de inzet van die mensen een minpuntje; die doen alles. En heel veel andere mensen kijken ook altijd hoe zij het doen. Als je dat in goede banen leidt en hun ideeën vanuit hun eigen kracht laat opbloeien, ze daar niet teveel stuurt (dat werk ook weer remmend) en ze in hun waarde/kracht zet, dan merk je dat in alle lagen van de organisatie en in alle leeftijden die personen naar voren komen.

Nick: Wordt er binnen de organisatie, vanuit welke laag dan ook, onderscheid gemaakt in de belangrijkheid van kennis? Je kan allerlei soorten kennis hebben als organisatie, maar wat wordt binnen Koninklijke Visio gezien als essentiële/kritische/zeer belangrijke kennis gezien voor de hele organisatie?

[Kritische kennis valt binnen de onderwerpen van de expertisegroepen] We hebben het alleen gewaardeerd op grond van die speerpunten. Zoals onze expertisegroepen ook al zijn opgebouwd. De onderwerpen van de expertisegroepen zijn:

- Arbeid
- Autismspectrumstoornissen (ASS)
- Crebrale visuele imperking (CVI)
- Low vision
- Niet aangeboren hersenletsel (NAH)
- Neuronale ceroid lipofuscinose (NCL)
- Orientatie en mobiliteit (O&M)
- Psycho sociaal
- Tactiele waarneming en braille
- Visuele en auditive beperkingen (VAB)
- Visueel verstandelijke beperkingen (VVB)
Dat zijn de expertisegroepen die komen voort uit de speerpunten van Koninklijke Visio. Om de 5 jaar laat de organisatie zien waar zij zich op richt, op welke speerpunten, en steeds kijken we of de expertisegroepen nog aansluiten bij de speerpunten, bij de visie van onze organisatie. Dat is eigenlijk onze kritieke kennis; die kennis zit in die onderwerpen, waar de cliënt uiteindelijk baat bij heeft. Daar willen we dat uitkomsten op komen, wetenschappelijke onderzoeken, projecten of anderzijds initiatieven die vanuit de werkvloer worden opgezet.

[Expertisegroepen komen periodiek fysiek samen] De expertisegroepen komen voornamelijk periodiek ook echt fysiek bij elkaar maar ook steeds meer met videoconférence mogelijkheden. Je merkt dat een fysieke samenkomst vaak wel evident is. Daar komen mensen vanuit het hele land bij elkaar en daar spreken ze op die onderwerpen: ‘wat is nu van belang?’, ‘waar zitten kennishiaten?’, ‘waar moeten we op inspelen?’, ‘wat vinden we van belang waar de organisatie naar kijkt?’ ‘wat zijn de trends?’ Deze expertisegroepen geven advies aan de organisatie op die gebieden; waar verbeteringen moeten plaatsvinden op het initiatief.

[Expertisegroepen komen eens per maand, kwartaal of nog langer samen. Hangt af van het onderwerp] Er zijn expertisegroepen die maandelijks bij elkaar komen, anderen eens per kwartaal en anderen nog minder. Dat is verschillend. Dat hangt soms ook wel af van het onderwerp; hoe minder mensen gespecialiseerd zijn op het onderwerp, hoe wilder ze zijn en hoe minder vaak ze dus ook ingezet kunnen worden.

Nick: Hoe groot zijn die aantallen?


Nick: dat zijn de hoofden van een afdeling?

[Expertisegroepen bestaan voornamelijk uit mensen die echt werken met de cliënt en kennis hebben van het onderwerp] Nee dat zijn voornamelijk mensen die echt werken met die cliënt en die kennis hebben van het onderwerp. Mensen van MBO, HBO of hoger, maar die op een of andere manier veel kennis hebben op dat onderwerp. Dat zijn vaak geen managers. Heel vaak mensen die met de handen aan het bed staan, onderwijs geven, of bij woon- of dagbestedingen aanwezig zijn. Zij hebben dus echt kennis van het onderwerp en weten wat er speelt bij de cliënt.

[kennisdeelbijeenkomsten] Alle expertisegroepen komen een keer per jaar samen op een kennisdeeldag. De expertisegroepen etaleren dan op die dag hun kennis voor alle vakgenoten. Dat doen ze door het geven van presentaties, lezingen, workshops en er staan stands.

Nick: En deze kritische/essentiële kennis, hoe is die beschikbaar voor alle werknemers van heel Koninklijke Visio?

[Kritische kennis beschikbaar via methodieken] Dat is natuurlijk een utopie, zij geven hun bevindingen, dat kan in een project zijn en dat project wordt op een gegeven moment een methodiek en dan wordt die methodiek voor iedereen zichtbaar. De medewerker moet wel een hele goede reden hebben om die methodiek niet te gebruiken in zijn dagelijkse praktijk. Dus zo kan de methodiek vanuit het project een uitkomst zijn van een expertisegroep.

[Kritische kennis beschikbaar via expertisewijzer] We hebben ook een expertisewijzer. Dat is een periodieke nieuwsbrief waarin expertise activiteiten zoals het werk van de expertisegroepen naar voren
komt. Dat is een periodiek digitaal blaadje. We hebben ook een soort etalageplek voor alle expertisegroepen op het intranet waar zij hun uitkomsten ook kunnen delen (expertiseplein).

[Kritische kennis beschikbaar via een wetenschappelijk onderzoek, symposium of congres] Het kan ook dat een expertisegroep zegt: we moeten een wetenschappelijk onderzoek/symposium/congres starten op een onderwerp waar een kennishiaat is. Dan is dat dat een manier waarop het zichtbaar wordt voor de organisatie.

Nick: Het is dan aan de individuele werknemer zelf om daar iets me te doen?

[Zowel push informatie als eigen regie] Ja, er zijn bepaalde zaken die we vinden dat elke werknemer moet krijgen, maar ze hebben hierin ook wel echt de ‘eigen regie’. Dat is binnen de zorg een thema en wij hanteren dat ook steeds meer. Er is altijd wel bepaalde push informatie die je meekrijgt, die wij heel belangrijk vinden, op het intranet of op een andere manier binnen de organisatie te verspreiden. Maar veel aangeboden informatie valt onder de categorie ‘need to know!’ Dat wil/moet je niet missen!

[Gesprekcyclus met manager (POP)] Maar uiteindelijk is het de medewerker zelf die overlegt met zijn manager, in zijn POP gesprekken. We hebben een gesprekken cyclus die een medewerker jaarlijks door moet gaan om te laten zien dat hij nog steeds zijn ervaring en kennis op pijn houdt als het ware; dat hij zijn functie nog steeds kan voldoen. Maar dat is iets waar de werknemer een bepaalde zelfstandigheid en eigen regie in heeft.

Nick: Hoe de werknemer dat invult; welke kennis en op wat voor manier hij up-to-date blijft, dat wordt afgesproken met de manager?

[Push, leergangen, aan medewerker zelf] Nou, een deel is die push; de expertisewijzer, het intranet, die krijg je gewoon binnen. Er zijn ook mogelijkheden dat je met je manager je leergangen doorlaat om te bepalen waarin je nog een opleiding of scholing nodig hebt. Via onze academie kun je dan mogelijk je kennis omhoog halen door het volgen van een studie. Heel veel andere zaken is inderdaad aan de medewerker zelf, al dan niet in relatie met KM.

Nick: Wat is dan concreet, de laatste tijd, een kennisonderwerp dat zo belangrijk was dat het werd gepusht en van iedereen wordt geacht dit te weten of dit te doen..

[Voorbeeld van push informatie: methodoek] Dat is het methodenboek. Ik neem als voorbeeld weer het zetten van koffie. We merkten dat er zoveel verschillende manieren werden gebruikt om koffie te zetten, dat je op een gegeven moment denkt van ‘we willen gewoon één, twee of drie manieren en dat is goed; zo kan een cliënt het leren’. Die gekozen methoden hebben zich, bijvoorbeeld op die effectladder, al bewezen dat ze valide genoeg zijn, of zelfs wetenschappelijk zijn onderzocht. Wij geven als organisatie dan aan: ‘wij willen dat jullie op die manier gaan werken’. Dus dan wordt dat eigenlijk gepusht. Maar uiteindelijk is het een evident ‘need to know’, waar de medewerker en cliënt baat bij hebben.

[Er wordt van de medewerker verwacht dat hij/zij deze push informatie ook gaat toepassen] Er wordt ook wel vanuit gegaan dat je daar ook gebruik van maakt, mits je echt geldige redenen hebt om daar vanaf te wijken. Dat moet je dan ook aan de organisatie laten weten. En doe je dat niet, dan zal er ook een bepaalde manier om gevraagd worden.

Nick: dus een deel wordt “verplicht” (tussen haakjes) en de meer vrijwillige zelfontwikkeling wordt met de manager afgesproken, wordt dat ook nog ergens beoordeeld?
**[Beoordeling individuele ontwikkeling bij gesprekkencyclus]** Bij de gesprekkencyclus word je op individueel niveau beoordeeld op je ontwikkeling en hoe jij je vaardigheden en vakbekwaamheid op pijl houdt. En voor de rest qua beoordeling ben ik daar niet van op de hoogte.

**Nick:** Bij sommige organisaties bijvoorbeeld wordt heel specifiek vastgelegd: nou als je die functie hebt, dan moet je per se deze competenties hebben en op deze manier scoren.

**[Functiehuis: een medewerker moet voldoen aan bepaalde competenties beschrijven in zijn/haar functieprofiel]** Wij hebben wel een functiehuis. Dan houdt in dat iedereen die een bepaalde functie heeft moet voldoen aan bepaalde competenties die staan opgeschreven in je functieprofiel. Daaraan moet je ook als je solliciteert aan voldoen. Denk aan bepaalde competenties of diploma's die je moet halen. Op een gegeven moment komt er bijvoorbeeld een project uit dat iedereen van een bepaalde functie een training moeten gaan volgen om bij te blijven. Dat is dan één van de uitkomsten van één van die KM processen. Het kan dus zijn dat het blijkt dat een bepaalde functie een bijscholing moet gaan volgen. Op die manier word je dus wel op een bepaalde manier “verplicht”.

**[Ook een push tot bijblijven vanuit de zorg zelf]** En je hebt natuurlijk ook vanuit de zorg zelf dat je op een bepaalde manier wordt gepusht. Bijvoorbeeld dat er vanuit de zorgsector zelf een teken is van ‘joh, alle ergotherapeuten moeten nu bijscholing volgen’. Denk bijvoorbeeld aan het behalen van accreditatiepunten bij bepaalde functies.

**Nick:** Globaal gezien, als we kijken naar een zicht over de gehele organisatie, vanuit hoger management bijvoorbeeld, op wie welke kennis bezit binnen de organisatie en eventueel nog buiten de organisatie. Op wat voor een manier is dat ik kaart gebracht?

**[Waar welke kennis zit komt naar boven drijven]** Nou, als je mee gaat werken aan projecten, en dat speelt vanaf de locatie zelf, daar zit natuurlijk het begin waar mensen kennis hebben en tot alle middelen die ik net genoemd heb. Het begint op de locatie, het begint op het niveau van de leidinggevende met zijn eigen medewerkers. Tot aan die expertisegroepen, tot aan het meedoen van wetenschappelijk onderzoek, tot meedoen aan projecten. Zo komt er vanzelf uit waar de kennis zit. Tot aan die kenniskaarten.

**Nick:** Koninklijke Visio heeft bijvoorbeeld veel verschillende locaties en ook veel verschillende onderwerpen. Zijn die verschillende fysieke locaties bijvoorbeeld, die misschien best wel overlappende dingen doen, van elkaar op de hoogte?

**[Locaties van elkaar op de hoogte door expertisegroepen]** Dat komt door de CoP’s/ expertisegroepen bijvoorbeeld. Daar zitten mensen van het hele land bij elkaar.

**[Eilandgevoel blijf je houden, maar het wordt uniformer]** Als je met meerdere locaties werkt blijf je altijd een deelieiland gevoel houden. Mensen die toch hun eigen initiatieven gaan doen en waarvan je later denkt ‘verdorie, dat hebben we gemist, dat hadden we met elkaar moeten doen’. Dat blijf je altijd houden, maar je merkt wel dat, door die initiatieven die we met elkaar besproken hebben, je steeds meer dat uniforme krijgt. Dat je steeds meer van elkaar op de hoogte bent van wat we aan het doen zijn. Ook kom je er daardoor steeds meer achter wie de kennishaarden zijn.

**Nick:** Merkt u vooruitgang in het op de hoogte zijn van elkaar?
**Medewerkers weten elkaar steeds beter te vinden** Jazeker. We zijn nu een organisatie die sinds de fusie, een jaar of 5 geleden, ontstaan vanuit allemaal van die kleine locaties die elkaar niet kenden. Ondanks dat het met horten en stoten gaat, de ene keer met een groot succes en de andere keer met een minder groot succes, merk je dat mensen elkaar steeds beter weten te vinden.

**Nick: En ontstaan er dan nu ook samenwerkingen tussen mensen die elkaar voorheen helemaal niet kenden?**

**Het kan niet anders dan dat zulke samenwerkingen er zijn en mensen meer van elkaar op de hoogte zijn** Of ze elkaar niet kennen weet ik niet, maar als het goed is zou dat zo moeten zijn. Ik kan dat niet heel concreet zo zeggen, ik ken de individuele gevallen daar niet van, maar dat kan niet anders. De mensen van de verschillende organisaties die tot één Koninklijke Visio zijn geworden en die elkaar nu steeds meer gaan vinden in die expertisegroepen, maar ook in al die push berichten; het kan niet anders dan dat die beter van elkaar op de hoogte zijn.

**Participatie is wel een vereiste** Mits zij er inderdaad zelf ook behoefte aan hebben en daar actief aan bijdragen. Want als jij met je armen over elkaar achterover in de stoel gaat zitten en niets doet, dan kan je nog zoveel willen kennisdelen, maar dan schiet het niet op.

**Nick: En hebben jullie, ten eerste al de vraag of je dat zou willen of niet, inzicht in welke personen daar minder in meedoen?**

**Richten op energiehaarden/best persons die wel mee doen, niet op diegenen die het niet doen** Nee, we gaan niet uit van die gedachte. We kijken meer vanuit die omgedraaide manier, naar wie dat wel doen. Vanuit die best persons, vanuit die energiehaarden.

**Bij cyclusgesprekken eventuele aansporing tot actiever deelnemen** Als mensen dat niet doen, dan zal op een gegeven moment vanuit die gesprekcyclus met zijn manager moeten worden gezegd ‘jongen, je doet je best niet en je moet ervoor zorgen dat je meer deelneemt aan bepaalde activiteiten’.

**Richten op degenen die wel actief meedoen, want het is een utopie om te denken dat je iedereen van de Koninklijke Visioan het kennisdelen krijgt** Maar dat is niet zoals wij naar KM kijken, wij gaan meer uit van het positieve van de mensen die het wel doen. Het is een utopie om te denken dat je alle 3000+ medewerkers aan het kennisdelen gaat krijgen. Je moet echt uitgaan van degenen die het wel doen. Het blijft eigen regie: uiteindelijk zou iedere medewerker vanuit zijn vakbekwaamheid dat moeten willen. Maar er zijn mensen die altijd om 5 voor 5 de spullen pakken, en mensen die er altijd om 10 over 5 nog werken, om even weer te geven dat je die mensen altijd zal hebben.

**Nick: Het gaat over mensen die essentiële kennis bezitten. Dat komt misschien door jarenlange ervaring in het vak. Die mensen gaan misschien binnenkort met pensioen. Zijn er trajecten om toch die kennis binnenshuis te houden?**

**Programma Kennisbehoud (exit gesprekken, meelopen met kritische kennishaarden). Nog in de kinderschoenen** Ja, wij zijn nu bezig met een programma ‘kennisbehoud’. Daarin is het de bedoeling dat er exit gesprekken van te voren al worden opgezet en/of dat daar op een of andere manier peers mee gaan lopen met kritische kennishaarden. Dus met de mensen die kritische kennis hebben. Dat project staat echt nog in de kinderschoenen. Dit jaar gaan we daar ook weer een workshop op zetten.
Daarnaast hebben wij ook een gepensioneerde club ‘Visioen’ waarin wij gepensioneerde medewerkers de mogelijkheid bieden om toch actief betrokken te blijven bij de organisatie en ook kennis te blijven delen. Dan kun je denken aan een nulurencontract waarbij mensen vrijwillig nog steeds actief zijn, omdat zij heel veel kennis bezitten, of omdat zij kennis willen blijven delen.

De exit gesprekken werden in het verleden ook wel gedaan, maar we hebben het nu weer opnieuw opgepakt omdat we het toch wel belangrijk vinden dat er bepaalde kennis wordt behouden. Je kan niet met iedere medewerker een exit gesprek gaan voeren, omdat niet elke kennis kritiek is. Wij hebben bijvoorbeeld een klinisch fysicus in huis en daar zijn er niet zoveel van. Die hebben hele specifieke kennis. Het is waarschijnlijk zo dat hij zijn kennis al gedurende zijn loopbaan in de expertisegroepen, in projecten of in gemeenschappelijk onderzoek al heel veel heeft overgedragen, maar mocht hij vertrekken, dan willen we toch wel heel graag kijken of we alle lijntjes goed hebben doorlopen in zijn persoonlijke kennis gebieden. We vinden het dan belangrijk om exit-gesprekken of peer-to-peer mogelijkheden aan te bieden. Zo’n klinisch fysicus heeft dus kennis in een functiegebied dat voor ons van kritieke waarde is.

Er zijn ook mensen die niet alleen op functieniveau maar ook op inhoudelijk niveau, persoonlijk veel meer, van kritieke waarde zijn gebleken. Ver voordat ze met pensioen gaan of om een andere vertrekken willen we daarvan op een bepaalde manier de kennis ook van eliciteren als het ware.

Nick: Hoe bepaal je dan wel welke mensen er wel of niet in aanmerking komen voor zo’n traject?

Dat kan doordat je altijd kijkt naar de speerpunten van de organisatie. Daar zie je dat onderwerpen heel specifieke kritieke kennis zijn voor de organisatie die dus eigenlijk laten zijn waarom Koninklijke Visio er toe doet. Die het welslagen van de organisatie laten zien. Als mensen daar, al dan niet door de functie of door de persoonlijke kennis en ervaring, een enorme toegevoegde meerwaarde zijn en er voor zorgen dat Koninklijke Visio er nog meer toe doet, dan geeft je dat aan dat ze die in de gaten moeten houden. Die personen hebben vaak gedurende hun loopbaan, door hun inzet voor projecten, door hun inzet voor CoP’s, zich al behoorlijk laten zien waardoor je goed op de hoogte bent van die kennisgebieden. Als het goed is heb je gedurende hun werkcarrière al goed in de gaten wie dat zijn en kun je ze zelfs in hun pensioen met de Visioen groep bij de organisatie proberen te houden.

Nick: Dus u gaat er vanuit dat ze door de jaren heen wel zo’n naam hebben opgebouwd dat het wel duidelijk is welke personen dat dan zijn? Dus eventuele personen die misschien in meer of mindere mate kritische of heel belangrijke kennis bezitten maar minder actief meer zijn in het, bijvoorbeeld wat er nu aankomt de kenniskaarten...

KM gaat over intrinsieke motivatie, je moet zelf willen kennisdelen. Dat wordt allemaal bevorderd door die systemen die we hebben besproken en ook door de gesprekken die je hebt met je leidinggevende. Als je dat in je loopbaan niet doet, dan komt het niet naar boven, dan houdt het op. Het blijft ook bij je eigen regie, dus diegenen die een stapje meer willen doen. Degenen die hun kennis willen bijhouden of delen zullen daar op een gegeven moment in hun gesprekkencycli met hun manager ook op worden aangesproken. Maar je gaat dus uit van het positieve effect en niet van de personen die het niet doen.
En dat hoort denk ik ook wel een beetje bij de tijdsgeest: we gaan niet alleen de mensen achterna zitten die het niet doen, maar de mensen die het wel doen stimuleren we. Dat is ook zo als je niet wilt meedoen in de maatschappij; dan word je tot een stille muis, een grijze muis. Als je actief meedoet dan heb je steeds meer mogelijkheden om te floreren en te etaleren in de organisatie. Dat is het uitgangspunt van KM denk ik. Het blijft toch altijd liggen bij de werkers op de werkvloer, die hun eigen regie en eigenlijk ook het hele KM van de organisatie in de hand hebben. Als zij niets doen, dan houdt het op, dan kan je nog zoveel pushen wat je wil, maar dan houdt het op. Maar de praktijk leert dat het altijd wel gebeurt.

**Nick:** Wat ik zo hoor is dat jullie er op heel veel verschillende manieren heel actief met KM bezig zijn. Bij een bedrijf wordt KM vaak gelinkt aan een betere marktpositie of meer winst bijvoorbeeld..

**Einddoel (ook van KM) binnen Koninklijke Visio: dat de cliënt er beter van wordt!** Bij ons dat heel anders in de zorg. Het uitgangspunt is dat de cliënt er beter van wordt. Dat is een hele andere insteek. Wij zijn er niet om de stoelen van de medewerkers warm te houden of om te zorgen dat er meer KM gedaan wordt. Nee, het moet wel heel duidelijk zijn dat de cliënt er beter van wordt. Daar draait alles om.

Als de cliënt er beter van wordt, dat kan onder andere door KM, dan zeggen we: het is gelukt!

**IT systemen én CoP/projecten nodig**


**Social media**

**Social media als kennisdeelmiddel onontbeerlijk** Wat we ook nog niet hebben besproken als middel: sociale media. Dat is tegenwoordig onontbeerlijk in je organisatie om kennis te delen. Als je ziet hoe LinkedIn bijvoorbeeld gebruikt wordt door onze vakmedewerkers maar ook om onze concilega’s (zo noem ik die maar even) in de gaten te houden als het ware... Om de markt in de gaten te houden. Je ziet dat Twitter, LinkedIn, Yammer (wij gebruiken Yammer als bedrijfs social media), onontbeerlijk zijn om bij te blijven. In die hele informatie overload moet je zelf de regie voeren; wat is voor jou nu van belang om jouw kennis op pijn te houden?

**Nick:** De mensen die daar niet mee bezig zijn, of het niet kunnen qua digitaal, smartphones..

Die heb je natuurlijk wel, maar ook hier gaat het om intrinsieke motivatie. Zij die willen, volgen.

**Grote uitdagingen voor kennisdeling**

**Kennisdelen moeilijk in combinatie met bepaalde functies** De grootste tegenstand is nog dat mensen gewoon moeten werken. Als jij op een woon en dagbesteding staat of onderwijs geeft, dan werk jij al een hele dag, 8 uur per dag, dan moet je ook nog eens in staat worden gesteld om kennis te delen ernaast, dat kan nog wel eens een uitdaging zijn. Als jij je cliënt gewoon in de gaten moet houden, en met de
verzorging bezig bent van de cliënt, dan is het een extra stapje om ook nog eens al die middelen te gaan bijhouden of bij te wonen. Dat is nog de grootste uitdaging: om mensen van de werkvloer naast hun werk kennis te laten delen.

**[Organisatie: ‘handen aan het bed’ gaat voor KM activiteiten]** Het is ook zo dat de organisatie het liefst de handen aan het bed heeft zodat de cliënt er beter van wordt. Dat is uiteindelijk ook financieel het meest voordelig natuurlijk. Als mensen dan andere dingen gaan doen of bijvoorbeeld zich bezig gaan houden met KM, dan wordt er al heel snel gezegd: nee, we willen de handen aan het bed. Daar moeten mensen soms ook in worden overtuigd. Een combinatie van beide is van wezenlijk belang!

**[Nodig: visie uitdragen, mensen overtuigen]** Dit gaat soms wel en soms niet goed. Dat hoor je wel eens vaker; dat is visie uitdragen. Wij zijn een domein (KEI), wij hebben een directeur die zal ook met directeuren van de verschillende domeinen, zoals woon en dagbesteding, revalidatie en advies, en onderwijs, gesprekken moeten voeren. Af en toe moet je echt op de bühne staan of de hort op om mensen te overtuigen dat het zo belangrijk is dat jouw medewerkers ervoor zorgen dat de kennis van de organisatie stroomt. Duidelijk maken dat uiteindelijk daar ook zeker de cliënt beter van wordt en niet alleen de handen aan het bed. Dat blijft altijd ook een bepaalde push daarin.

*Nick: Sinds de fusie bijvoorbeeld, is dat in uw ogen wel veel beter geworden?*

**[Situatie voor de fusie niet bekend. Nu: Koninklijke Visio is een expertiseorganisatie waarbij kennisdelen hoog op de agenda staat en van evident belang is om ook een expertiseorganisatie te zijn]** Ik weet niet hoe het hiervoor was. Ik weet alleen dat wij nu een expertiseorganisatie zijn, dat kennisdelen hoog op de agenda staat en dat wij daarop worden beoordeeld vanuit de steunstichtingen die ons subsidiëren en ook vanuit de overheid zelf die ons subsidieert. Kennisdelen is van evident belang om de organisatie ook een expertiseorganisatie te laten zijn. De cliënt vaart hier uiteindelijk wel bij.

**[Cultuurverandering gaande: werknemers, directeur en managers steeds meer doordrongen dat kennisdelen een essentieel onderdeel is. Met als eindstap dat de cliënt er beter van wordt]** De meeste medewerkers worden er wel steeds meer van doordrongen, ook de directeur en managers, dat kennisdelen een essentieel onderdeel is van het medewerker zijn binnen Koninklijke Visio, van het welzijn van de organisatie, van het ervoor zorgen dat de cliënt er uiteindelijk beter van wordt. Dat is altijd het einde van de stap. Cultuurverandering is een van de moeilijkste dingen die er is; gedragsverandering en cultuurverandering. Sommigen zeggen dat het niet kan (er zijn ook een hele hoop boeken over geschreven), maar het blijft in ieder geval een proces dat altijd in beweging is.
APPENDIX B. KM INITIATIVES MENTIONED BY INTERVIEWEES

This appendix includes KM initiatives and activities mentioned by the interviewees. To re-summarise:
Person A works as a knowledge manager of Organisation 1 (public organisation; Dutch province), Person B worked at Organisation 2 (commercial organisation; international IT company) as a knowledge manager for many years, Person C works at Organisation 3 (commercial organisation; Dutch financial institution) as a non-knowledge manager, and Koman works at Koninklijke Visio (public organisation; centre of expertise in the field of visual impairments) as a knowledge manager.

The interviewed knowledge managers conduct activities in the areas of:

- creating overviews of knowledge (e.g. tracking projects, writing reports, identifying knowledge gaps, keeping other parties up to date);
- giving directions/advise on knowledge related topics (e.g. knowledge and research agenda in organisation 1, steering role of KEI in Koninklijke Visio);
- acquiring knowledge from inside and outside the organisation (e.g. universities, consultancy bureaus, internal projects), connecting parties (e.g. business and universities);
- initialising and leading projects (e.g. projects based on CoPs in Koninklijke Visio), storing knowledge/information (e.g. databases of projects, studies, methods);
- organising events where people gather and share knowledge (e.g. workshops, knowledge cafes, CoPs, knowledge sharing days, symposia);
- transferring knowledge/information (e.g. intranet news page, news bulletins, keeping parties up to date);
- making people more aware of the importance of KM and knowledge sharing (e.g. cultural change, “it is needed sometimes to really get out there and convince people” Koman),
- connecting/configuring/implementing/promoting (social) IT systems (e.g. expert finder function, link to HR systems, collaboration software).

IT systems (including an expert finder function and databases of studies, projects, methods etc), CoPs research/project/methods databases, education trajectories, and function profiles linked to competencies are commonly used within the discussed organisations. These are elaborated on first. Then other initiatives are given as a list.

The IT systems usually include an expert finder function (Person A; Person C; Koman), a news portal that may be social (e.g. ‘like’, ‘follow’, ‘share’ options) (Person C; Koman) and databases that include relevant information such as reports, projects, scientific studies (Person A; Person B; Person C; Koman) or methods (Koman).

An expert finder function is mentioned by three interviewees (Person A; Person C – ‘intranet expertise initiative’; Koman – ‘wie-is-wie’ or ‘kenniskaart’). This function is a part of the organisations’ intranet in which each employee has their own profile page and users can search for such profiles by name or possibly other key words. Such a profile usually shows the persons’ name, function, e-mail and telephone number and optionally more information about one’s knowledge, expertise and experience for example (Person A; Person B; Koman). These additional fields are usually not mandatory to be filled in (Person C; Koman). Such an expert finder function or system has the potential of being a valuable body of knowledge to see what knowledge is available by whom in the organisation (Person C). It can add to the insight in ‘who knows what?’ (Koman). However, in all cases discussed in the interviews, the expert finder function
it not seen as a success. That is, it is not often used by employees and if it is used, than mostly for finding a persons’ e-mail address, phone number or function (Person A; Person C; Koman). The main problem is argued that too few people have filled in their profiles adequately, especially the voluntary fields related to that persons’ knowledge and expertise (Person A; Person C; Koman). The main reason for this is argued a lack of motivation and discipline by the person in question to use this function and/or fill in his or her profile (Person C; Koman). Person C (who sees the greater potential of this function) explains that he rarely uses the finder as he feels that he does not (yet) need it in his daily work, he does not miss the functionality. He also deliberately does not fill in his profile because he wants to prevent even more people coming by his office asking questions. He has enough work to do already (Person C). Person C further argues that there has been little to no incentives by the organisation to fill in his profile and use the service. He argues that management should be more strict in controlling these activities (maybe force them up to a certain point) in order to get it working initially. Maybe later on, when employees experience the usefulness of the function, they become more motivated themselves.

Koninklijke Visio will change to a newer intranet software version in the future that connects HR systems to the new expert finder function and so more (not all) profile fields are mandatory filled in. Knowledge related fields, however, stay voluntary in line Koninklijke Visio’s approach of being in own control (‘eigen regie’). Koman argues that people have to be intrinsically motivated to share knowledge. He hopes that with just using the HR connection and relying on intrinsically motivated people that already are involved in CoPs to frequently fill in their profiles, the initiative will automatically grow and knowledge sharing will be based on intrinsic motivation.

Another common KM initiative is a Communitie of Practice (CoP) (Person B; Koman). Organisation 2 sees them as black-boxes that work (knowledge is being shared and it contributed to employees’ satisfaction), but there was no interest in how they actually worked (Person B). The CoPs in Koninklijke Visio are formed around the subjects that are seen as important for Koninklijke Visio (‘speerpunten’ or spear points). These CoPs are concerned with questions such as ‘what is important at this moment?’, ‘are there any knowledge gaps?’, ‘what are the latest trends?’ and ‘what is important for the organisation to look at?’, and give advise to Koninklijke Visio in what can and should be improved (Koman). Within Organization 1, Person 1 organizes Knowledge Cafes, which are voluntary gatherings of people in which questions from inside the organisation are answered by the group. They run well (about 30 to 40 people each time) and participants are intrinsically motivated. A knowledge café is seen as a success whenever the person or group who posited the question can move forward after the session (Person A).

In (at least) three of the four organisations (Organisation 2; Organisation 3; Koninklijke Visio) a system is used where for each function/job profile certain competencies are defined that an employee with that function must have. Employees are evaluated on these competencies by their manager usually at least once a year and following actions may be initiated. Within Organisation 2, dependent on one’s senior level, a certain score (number) on these competencies is expected. Based on the interactions of the employee and his or her manager, the manager scores that person (Person B). The results are used to manage the individual, but are also aggregated to see how a group or department performs (Person B). It might be very useful to know and detail exactly what types of persons are needed, who are able to execute certain tasks, argues Person B. However, doing so may neglect additional ideas, knowledge and qualities of employees and makes people, who do not feel comfortable in such a strict system, to eventually leave (Person B). In Organisation 3, twice a year, each employee is evaluated and scored on performance, expertise and potential (e.g. below average, average, above average) and the risk of that persons’ leaving the organisation. Such a meeting usually involves a direct manager of that employee, a
higher manager and a person from HR. All these examinations are based on the direct experiences with that person, but also on what they hear from others (e.g. direct colleagues of that person for example). No number of days absent are used for example (PerB). In Koninklijke Visio, a similar system is called ‘Functiehuis’ where for each function, specific competences are defined the person in question must have. During a yearly cycle of meetings with his or her manager, the employee must show that his or her knowledge and experience is (still) in line with his or her function profile. Such evaluation rounds may lead to the evaluated employee to go into a learning trajectory (either on own initiative or mandatory) (Person B; Person C; Koman), intensifying supervision (Person B), giving practical assignments (Person B), the organisation to try and make that person more comfortable/happy (when unhappy, performs good, potentially leaving) (Person C), or arranging the sharing of that persons’ valuable knowledge (when leaving) (Person C).

All four organisations facilitate and stimulate courses or training trajectories. These may be found on a dedicated intranet page (Person 1). Usually a consultation with the manager is involved before the learning process starts (Person A; Person B; Koman). An employee may apply for a learning process out of own interest (Person A; Koman), or may be “forced” to do so (Person B; Person C; Koman). For example, an employee may have to pass an e-learning trajectory related to the law of financial governance (Person B), to obtain a minimum number of accreditation points (Koman), or to meet the (minimum) competencies and requirements linked to his or her job profile/function (Person B; Koman) (see above).

Different methods are used to deal with (potential) knowledge loss due to leaving employees. For example exit reviews (Person2; Koman), mentoring/peer-to-peer trajectories (Person B; Koman) and a Retiree club (Koman). More on this subject later.

Other initiatives include:

- ‘KM toolbox’: Person B sees after exit reviews, mentoring, peer assist, post project reviews, mind mapping and Getting Things Done (GTD) as tools he can use out of his ‘KM Toolbox’.
- Personal Knowledge Management (PKM). Person B makes a case for personal knowledge management in addition to the often emphasized social dimension of knowledge management, he argues. He states that it is important to create the right conditions for knowledge workers to think independently. Therefore, he argues, tools are needed that value the individual and not only as a member of a wider community. He argues that by using PKM tools and techniques, knowledge workers are likely to experience more space in their lives, as well as be more open to social-emphasizing-KM. An example of a PKM tool is Getting Things Done (GTD), he argues.
- Social intranet. A user can ‘like’, ‘share’ and ‘follow’ items, communicate and collaborate, and so create a more personalized information stream and environment (e.g. Koninklijke Visio).
- News page on the intranet: to spread information (e.g. Koman).
- Periodical digital magazine ‘expertisewijzer’ of Koninklijke Visio (linked to the expertiseplein; shows recent expertise activities including the work of CoPs).
- Symposia and conventions. Koninklijke Visio organises symposia and conventions, but also stimulates employees to attend (inter)national symposia and conventions (Koman).
- Social media (e.g. LinkedIn, Twitter and Yammer (internal social media software)): is essential to keep up with the market and share knowledge (Koman).
- Workshop. Person 1 (co)developed a workshop that: First, helps a group to determine what knowledge is wanted and which of that knowledge is available or not. Second, when some of the wanted knowledge is not available, the group determines where this knowledge could be gained
from. Third, when some of the wanted knowledge is available, the group determines how and with whom this knowledge will be shared. Fourth, actions are defined based on step two and three (Per1). Workshops are also a part of the knowledge sharing days of Koninklijke Visio (Koman).

- Knowledge sharing day: yearly gathering of CoPs of Koninklijke Visio, or based on other initiatives (Koman).
- Architecture: the architecture of the location Visio Het Loo Erf incorporates lounge areas where people can sit and converse in a calm environment, what stimulates knowledge sharing (Koman).
- Mobile App: Person A would like to develop a mobile app that is user-friendly and includes an expert finding function, a team creation function and a knowledge network visualisation function.
APPENDIX C. FINDINGS FROM INTERVIEWS COMPARED WITH KM LITERATURE

The findings from the interviews, do for a large extent, match the subjects and views found in the literature review but also indicate some differences between theory and practice and give additional insights. Appendix B includes an overview of the KM initiatives and activities mentioned by the interviewees. By ‘the organisations’ is meant the four organisations from the interviews.

A difference is found in the extensiveness and presence of KM within organisations based on the interviews. One organisation seems to have no KM department and identified a limited number of initiatives (Person C), while other organisations do have a dedicated KM department or team (Person A; Koman) and implement a wide variety of KM initiatives ranging from intranet systems, CoPs, symposia, knowledge sharing days, book of methods and more (Koman).

All interviewees named intranet systems as one of the main KM initiatives within their respective organisation. These systems may include a news page, a variation of an expert/people finder system, and databases with project files, (scientific) studies or manuals. Other common KM initiatives are events where people gather to share knowledge (e.g. CoP, Knowledge Café, knowledge sharing day), workshops or training sessions, and using competencies related to function profiles to evaluate an employees’ performance and development in that function.

Other less common identified KM initiatives include:

- Personal Knowledge Management approach: focus on independent thinking and learning of the individual. In addition to the common focus-on-collectives-KM. Examples of PKM tools are the method Getting Things Done and mind mapping (Person B).
- Architecture of a building is also related to KM: the architecture of the location Visio Het Loo Erf incorporates lounge areas where people can sit and converse in a calm environment, what stimulates knowledge sharing (Koman).

Within KM literature, there is put much effort into defining, classifying and giving perspectives on the notion knowledge in a quest to define what knowledge is. However, business people are generally not very interested in discussing and focussing on differences such as tacit-explicit or data-information-knowledge (Person B). They prefer dealing with concrete questions such as ‘how can we solve this problem?’, or ‘How can we prevent this project to become a great expense?’ This divide in perspective, Person B thinks, is one of the biggest reasons why KM as a field is relatively isolated.

It has been shown that there is little consensus on a definition of KM in the examined KM literature (section 2.3. 1). Definitions differ in what is considered the goal of KM. Based on the interviews there seems a difference in approach and what is seen as the end goal of KM between the commercial companies (Organisation 2 and 3) and the public companies (Organisation 1 and Koninklijke Visio). For the two commercial organisations, positive business metrics such as profitability, rates of growth, market share or the number of innovations for that company (Person B), and financial ratios (risk, compliance, control) (Person C) are highly important. KM should always contribute to those metrics (Person B). In contrast, these public organisations have a task (and are funded) to be a valuable knowledge resource to both internal and external parties. Here, KM is aimed to support this task of gathering, organising and making knowledge available, also to external parties. In addition, within the health sector (including Koninklijke Visio), the end goal is to create benefits for the client (not making high profits for example)
Koninklijke Visio aims to accomplish this by using KM to support working with more standardized and scientifically underpinned methods.

Boersma (2002) defines crucial knowledge to consists of that knowledge that gives the organisation a competitive advantage, strongly related to the core competencies of the organisation. The author emphasizes that the more crucial the knowledge is to the organisation, the better managers have to monitor it. This, however, can change over time when for example developments in the market require the organisation to develop new crucial knowledge or to dispose of obsolete knowledge.

The interviews indicate a difference in what is considered crucial knowledge: knowledge about versus knowledge itself. Person C argues that financial ratios (risk, compliance, control) are seen as crucial knowledge to the organisation as they indicate the financial well-being of the organisation (knowledge about). These are available (shown) through the management information system and updated weekly. On the other hand, Koman argues that all knowledge within the eleven subjects of the CoPs are crucial to the organisation (knowledge itself). This knowledge is available through the book of methods, via a periodical digital magazine, and scientific studies, symposia, or conventions (Koman).

The interviews indicate that employees mainly have insight in ‘who knows what’ through their social networks, directly knowing that person or indirectly via others (Person C; Koman). For example inside a department or location (Person C; Koman), or outside by collaborating in projects, CoPs and participating in studies (Koman). An adequate organisational wide insight in who knows what including all employees is limited in any of the organisations. The expert finder systems that are implemented to facilitate this insight over the whole organisation do not function properly because too many employees do not fill in their profiles sufficiently, especially the knowledge related fields (Person A; Person C; Koman). Such an organisational wide insight, however, is argued to make a valuable knowledge resource (Person C), and another organisation is planning a retry to make such a system a success (Koman). An additional insight is given by the employee evaluations performed by managers (Person C; Person B; Koman). These evaluations, however focus on the knowledge and competencies directly related to that persons’ function. In one organisation there is argued to be a good insight by the management in which employees have which function related competencies (and scores), however additional knowledge and ideas that do not fit the picture are often neglected (Person B). Thus, also from a central higher management point of view, the insight in who knows what, especially in knowledge that is not directly related to one’s function, is limited.

The interviews also indicate that an employee’s insight in the informal social network within the organisation is mostly based on what a person directly observes or from hearsay (Person C). The same holds for higher management; they also rely on what they see and hear directly or indirectly through their social network. Person B thinks that his organisation has no proper insight in the social network of its employees, for example in ‘who often collaborates with whom?’ , ‘are there any clusters of people which are highly introverted?’ or ‘who act as a boundary spanner for clusters of employees’. Insight in nodes (persons), other than defined by the organigram, is not available, he argues. If one, however, would make a network graph depicting the informal communication streams within organisation, he expects this graph to match, for a great part, the formal hierarchical structure.

Most of the interviewees indicated that their organisation incorporates some sort of knowledge retention initiatives. These differ however in approach and which persons are taken in consideration. One interviewee explained that during each semi-annual evaluation round the development and performance of each employee is discussed with that person’s manager and two others (Person C). These meetings
include a discussion about the chance that the employee in question will leave the organisation, in what
time span, and what impact that would have on the organisation. This is determined based on what the
personal interpretations of the manager and the two others and what they hear from others (e.g. if that
person is not happy with his job, talks about looking for something else etcetera). If that person is
expected to leave and holds important knowledge for the organisation, then the organisation could try
and make that person more comfortable, or arranging the sharing of that knowledge for example. The
latter option makes the organisation less dependent on that person. The interviewee is not aware of a
standardized procedure or guide of how to handle these cases and what steps are recommended and
have been proven successful. In practice, it is up to him to come up with ideas to handle these cases.
In contrast, another organisation just started a knowledge retention program (Koman). The goal is to
initiate exit reviews or a mentoring program for employees who hold crucial knowledge, long before their
leaving. The persons who qualify for such knowledge retention programs are the ones that have made a
name for themselves during their career. For example by their involvement in projects and CoPs. After
their leaving the organisation may try to keep these persons involved in the voluntary retiree club of the
organisation (Koman).
These seem two different approaches to knowledge retention, where the first structurally and explicitly
evaluates each employees’ impact on leaving (all ages, all functions) twice a year, the latter approach is
more focussed on a generally older employees and relies on that these persons have made a name for
themselves during their career.
In addition, another interviewee argues that potential knowledge loss due to collective aging is an issue in
the public sector (Person B). One of such organisations uses the following approach to handle this
situation: instead of trying to retain the important knowledge these employees have in relation to the
current organisational system, the organisation will be digitalised, making this knowledge obsolete in the
new situation. The outflow of employees, which mostly possess obsolete knowledge, is therefore not a
real problem to this organisation (Person B). Note, however, that new IT related knowledge may have to
be acquired. This is yet another example of how an organisation deals with potential knowledge loss.
Person B however notes that this digitalising of an organisation should not be applied in general to any
organisation. He gives the examples of potential knowledge loss of people who perform the maintenance
of specialized weapon systems or knowledge workers who run the nuclear reactors in the Netherlands.
This specialized, often procedural knowledge may be stored to some extend in (written down)
procedures, but there is always a contextual part lost. He argues that one may describe the procedure of
restarting a nuclear reactor, but a part about all the choices and reasoning behind this procedure may be
lost.

**Key KM points of interest**

This should be seen as a selection of KM related points which could be interesting for both knowledge
managers and non-knowledge managers who are or planning to conduct activities in the field of KM.

Both KM literature (e.g. (Alavi & Leidner, 2001)) and the interviewees acknowledge and emphasize the
potential value of mapping knowledge. That is, giving insight in what knowledge resides where in the
organisation and giving access to or directing to that knowledge, including uncodified knowledge held by
persons. Note that for small organisations such a system may not be needed as the employees know each
other personally. The interviews indicate that most large organisations have an expert finder system in
place, however it often does not function properly because too few people fill in or update their profile
sufficiently (Peron A; Person C; Koman). This is likely because of a lack of motivation. One of the
interviewees indicates that he deliberately does not fill in his profile because he does not want extra work
and questions (Person C). However, this same person also acknowledges the potential value of the system for the organisation. Thus, mapping knowledge (e.g. expert finder system) can be a valuable resource for finding relevant knowledge, however depending too much in intrinsic motivation from employees to fill in their own profile is not proven successful. To overcome this, Person C recommends more promotion of the expert finder system and more strict control by management. Possibly even make the filling in mandatory in the beginning until employees see the use and potential of the system (Person C). Another interviewee hopes that by reintroducing a more extended expert finder version, making more field mandatory (not all), and relying on the group of intrinsically motivated people to fill in and update their profiles, that the initiative will grow (Koman). These two suggestions are to be proven in practice within these organisations.

Thus, mapping knowledge (e.g. expert finder system) is argued potentially valuable, however assuming that all (or even enough) employees fill in their profiles based on intrinsic motivation is risky. Likely some external motivation is also needed.

Events or projects where people come together face-to-face are suitable for sharing tacit knowledge (e.g. (Torres-Coronas, 2008)). For example CoPs, Knowledge Café’s, symposia and mentoring programs are argued useful and valuable by both KM literature and interviewees (e.g. Person A; Koman). They are seen as successful by interviewees and mostly based on intrinsically motivated people (Person A; Koman), which is important for creativity and innovation for example.

Both KM literature (e.g. (Hansen, Nohria, & Tierney, 1999)) and interviewees (Person B; Koman) emphasize the importance of having a combination of KM IT systems (e.g. objectification strategy) and solution that bring people in contact to support tacit knowledge sharing (e.g. personalisation strategy). One interviewee explicitly argues that only relying on KM IT systems does not work, one needs both (Koman). However, smaller organisations likely do not need large expensive systems as they know each other and could use Excel sheets for example to store who knows what.

Group learning processes stimulate team spirit, intrinsic motivation and developing TMSs and valuable collective tacit knowledge (Osterloh & Frey, 2000; Wegner, 1995). This can improve group performance (Lewis, 2003), develop hard to imitate collective tacit knowledge, and lead to a better competitive advantage (Osterloh & Frey, 2000).

Embrace, stimulate and guide initiatives from the workplace. These initiatives are often found better than much of the systems thought of in advance (Koman).

Organisational culture is found an influencing factor on KM (Leidner, Alavi, & Kayworth, 2006) (see section 2.3.6). It is useful for an organisation to be aware of its culture and its effects in relation with its KM plans and goals. Possibly, the KM plans and goals set out do not match the organisational culture and are therefore likely to not fulfil their full potential. Interviewees emphasize the importance of an organisational culture in which knowledge sharing is seen as an integral part of the job and employees do not see knowledge sharing as something additional to their real job they have to in their free time (Person C; Koman). This is also where senior management can play a role, by acknowledging, embracing and taking leadership in knowledge management and not isolating it (Hansen, Nohria, & Tierney, 1999).

Offering worktime and stimulating employees to involve in KM activities.

KM literature (e.g. (Eriksson & Dickson, 2003)) and interviewees (Person A; Person C; Koman) emphasise the importance of evaluating projects, processes and initiatives is important to learn from and prevent
reinventing of wheels, making the same mistakes or doing things twice. These lessons learned should be stored and disseminated throughout the organisation to support similar projects, processes and change initiatives in the future (Vakola, 2000) in (Eriksson & Dickson, 2003) (Person C). One interviewee mentions that, although evaluation is important, it is often neglected in practice. It requires time, discipline and motivation (Person C). It is therefore suggested to management to implement such a learnings system, offer employees worktime to evaluate and also controlling these activities, at least in the beginning (similar to the expert finder case).

In addition to a lessons learned system, it also recommended to describe, store and give access to and inform employees on the latest processes and procedures within the organisation (Person C). It takes time and effort to find out ‘how things work’, especially when you are new to the organisation. Clear guides would definitely help and decrease search time (Person C).

Similar is the book of methods used in the organisation of one of the interviewees (Koman): this allows the organisation to work in a more standardized way using scientifically proven methods.

It is advised to make the latest developments within important fields easy accessible to the employees of the organisation, including recent research publications (Person C). This is done in some of the organisations from the interviews and seen as a success (Person A; Koman).

Related to evaluation are the results and measurability of initiatives. Concrete results help to get support from higher management (Person A) and are possibly required for managers and others who need to justify expenditures in a concrete way (Eriksson & Dickson, 2003). This is one of the challenges of KM; on the one hand concrete measurements and results may be required, on the other hand some KM initiatives are difficult to measure. Therefore, it may be better if the relationship between the knowledge manager and higher management (or others) is built more on trust instead of only hard results (an approach taken by Person C). However, it can help is a knowledge managers also reasons and talks in line with a business point of view. That is, asking and answering the question ‘How does the performance of the organisation improve by investing time, money and energy in this KM project?’ (Person C).

The extensive discussion about what is knowledge and its many classifications and definitions found in KM literature is found of little interest to business people (Person C). Emphasising and discussing all such perspectives may not add much value in the eyes of a non-knowledge manager.
The Knowledge Network Game

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INLEIDING

Deze handleiding voor de workshopleider is geschreven om helemaal zelfstandig aan de slag te kunnen met de GuruScan Knowledge Network Game (KNG). De beschrijving gaat uit van de meegeleverde materialen, maar is ook prima bruikbaar zonder. In de beschrijving gaan we er vanuit dat je de KNG doet met een team. Dit kan een daadwerkelijk team zijn, maar ook prima een virtueel team, gelegenheidscoalitie of andere groep mensen met een gezamenlijk doel of project. Voor ons is de KNG de eenvoudigste en meest gemakkelijke manier om inzicht te krijgen in, en meer gebruik te maken van, het informele kennisnetwerk van het team. Daarnaast is de KNG vooral leuk om te doen en geeft het altijd zinvolle gespreksstof voor het team.

Veel succes en plezier met de KNG!

VOORBEREIDING

CONCEPT

Het GuruScan concept berust op het (laten) aanwijzen van kennisdragers door collega’s. Iedereen kent iemand die meer weet over een willekeurig onderwerp dan hij of zij zelf. GuruScan maakt deze informele kennis-netwerken zichtbaar en bruikbaar. Zie hiervoor ook onze online concept movie op www.guruscan.nl/concept (Engels). Onze benadering is gebaseerd op de kennisdefinitie van prof. Dr. Mathieu Weggeman, hij zegt dat Kennis een combinatie is van Informatie, Ervaring, Vaardigheden en Attitude. Dat onderscheid wordt ook aangeduid als expliciete (informatie) en impliciete kennis. De KNG maakt veel impliciete kennis zichtbaar en vindbaar zonder deze inhoudelijk op te schrijven of vast te leggen.

KNOWLEDGE NETWORK GAME

De Knowledge Network Game biedt een laagdrempelige manier om zelf aan de slag te gaan met kennismanagement. Het is bedoeld om in een interactieve workshop met een kleine groep mensen, elkaar inzicht te geven in het gedeelde kennisnetwerk. Je kunt het gebruiken om je team of project beter te laten samenwerken of elkaar beter te leren kennen. Het kan ook de opmaat zijn voor een intensiever kennismanagement traject of onderdeel van een organisatieverandering. Het levert je in ieder geval gegarandeerd inzicht in de belangrijkste kennisgebieden voor het team.

PRAKTISCHE ZAKEN

De materialen in het KNG pakket zijn toereikend om één KNG sessie te organiseren. In een sessie wordt een kenniskaart gemaakt door maximaal 12 deelnemers voor maximaal 15 kennisgebieden. De sessie wordt geleid door jou, als workshopleider. Als workshopleider kun je ook deelnemen aan de workshop en dus ook jouw kennisnetwerk delen met het team. Het is dus geen enkel probleem als je ook deel uitmaakt van het team.

VOORBEELD DOCUMENTATIE

Achterin dit document zitten een aantal voorbeelden van documenten die je zou kunnen gebruiken bij het organiseren van de KNG.
UITVOERING

DOELSTELLING
Kennis en kennisprocessen dienen te helpen de organisatiestrategie waar te maken door de organisatie-doelen dichterbij te brengen. Dit betekent dat kennis wordt ingezet om de organisatiedoelen te realiseren. **Stel voor de KNG het doel op waarmee je deze netwerk-game gaat doen.**

Doelen die we in de praktijk tegenkomen zijn:

- versterken samenwerking team;
- voorkomen van dubbel werk in de (nabije) toekomst;
- steilere leercurve van het team en de individuele medewerkers;
- sneller schakelen op en delen van externe contacten.

Nieuwe teams schieten hiermee uit de startblokken en bestaande teams maken een flinke versnelling in hun samenwerking.

DEELNEMERS
De KNG is geschikt voor maximaal 12 deelnemers. Je haalt de meeste waarde uit de KNG als je deze doet met een groep mensen met wie je een gezamenlijk doel nastreeft. Dat kan binnen één organisatie of bedrijf zijn, maar ook een losser samenwerkingsverband. De simpelste controle is om te beoordelen of een deelnemer zich ‘echt’ kan vinden in de doelstelling zoals die bij het vorige blokje is opgeschreven. **Selecteer je deelnemers en nodig ze uit!**

COMMUNICATIE
De communicatie naar de deelnemers bestaat uit drie fasen: voor de KNG; tijdens de KNG en na afloop van de KNG. Voorafgaand aan de KNG wil je de (potentiële) deelnemers informeren en vragen om te participeren. Hiervoor hebben we een voorbeeld email in deze handleiding gedaan. Op basis van onze ervaring met (corporate) klanten hanteren we de volgorde: datum prikken; deelnemers uitnodigen; locatie regelen. Mocht dat voor jouw situatie niet de beste keuze zijn, wijk er dan vooral van af! Als je op dagelijkse basis intensief met elkaar samenwerkt, kun je deze communicatie natuurlijk prima inbedden in een bestaand overleg of (veel leuker) de GuruScan conceptmovie laten zien tijdens de gezamenlijk lunch!

De volgende stap is het definitief bevestigen van de KNG, bij voorkeur met de locatie in het bericht (zie voorbeeld email pag. 138). Ongeveer 1 week én 1 dag voor de KNG sturen we de deelnemers vaak nog een korte herinnering om ze voor te bereiden op de workshop.

De uitvoering van de KNG staat in meer detail beschreven onder het volgende kopje. Qua communicatie is het nuttig om iedereen direct na de KNG een bedankbericht te sturen met daarin de tijdlijn voor het vervolg.

Ongeveer een week na de KNG stuur je de resultaten naar alle deelnemers.
Ongeveer een maand na de KNG stuur je de resultaten plus de uitkomst van de interne bespreking daarvan naar alle deelnemers.

**PLANNING VOOR DE DAG**

**Voorbereiding**

- Boek een ruimte voor de workshop. Zorg voor koffie + thee (met een koekje) of fris + snoepjes. Zorg ervoor dat de ruimte groot genoeg is, de deelnemers gaan namelijk door elkaar heen lopen tijdens de workshop. Het gemakkelijkste is een ruimte met beamer, een vlakke vloer en voldoende ruimte om de posters van de kennisgebieden aan de muur te hangen.
- **Schrijf op alle 15 kennisgebied vellen (de grote vellen) de naam van het team, de datum en een nummer (1 tot en met 15).**
- Omdat er vaak grote overeenstemming bestaat over hetgeen belangrijk is voor een team of project, kun je ook een aantal kennisgebieden vooraf invullen.
- Schrijf de namen van de deelnemers op de tafelstandaards voor de deelnemers.
- Schrijf de namen + emailadressen van de deelnemers op het (grote) deelnemeroverzicht.

**De Dag**

- Klaarzetten van de workshop ruimte: je laptop met de presentatie aangesloten op de beamer; drinken + koekjes; de kennisgebied-vellen op tafel klaarleggen; de tafelstandaards + pennen + antwoordstickers verdelen over de zitplaatsen.
- **Ronde 1 (10 min)** - Als alle deelnemers binnen zijn geef je de introductie presentatie (zie voorbeeld).
- **Ronde 2 (10 min)** - Daarna kun je de (beschikbare) kennisgebieden gezamenlijk gaan invullen. Als er al een aantal kennisgebieden zijn ingevuld, laat die dan uiteraard eerst zien. Eventueel kun je deze ook voor begin van de sessie al aan de muur ophangen.
- Vul de (toegevoegde) kennisgebieden in op de kennisgebied vellen en hang deze aan de muur. Loop daarna gezamenlijk alle kennisgebieden langs en laat één persoon per kennisgebied kort toelichten wat hier mee bedoeld wordt.
- **Ronde 4 (15 min)** - Loop gezamenlijk door alle kennisgebieden + genoemde kennis en zorg ervoor dat voor iedereen duidelijk is wie er bedoeld wordt én hoe deze persoon benaderd kan worden. Dat laatste bij voorkeur door middel van een emailadres, maar kan ook telefoon zijn natuurlijk.
- **Optioneel** kun je nu al de eerste bevindingen/ervaringen bespreken. Wat valt de deelnemers op? Wat hadden ze wel verwacht? Wat hadden ze niet verwacht?
- Bedank de deelnemers daarna en sluit de sessie af.

**Afsluiten van de Dag**

- Maak foto’s van alle kennisgebieden en van de centrale posters ter verwerking van de gegevens.
- Bewaar alle papieren bij elkaar in de oorspronkelijke verpakking.
AFRON丁ING

VERSLAGLEGGING

- De verslaglegging bestaat uit: het oorspronkelijke doel; wat er feitelijk gebeurd is; wat daar kwantitatief uit kwam; wat er kwalitatief opviel; wat er nu met die resultaten zal worden gedaan/wanneer de resultaten worden besproken of gedeeld.
- De feitelijke uitkomst bestaat vaak uit kwantitatieve gegevens die een overall beeld geven. Daarnaast kunnen mooie en aansprekende grafische netwerkweergaves van het resultaat gemaakt worden. Deze laten vaak in één oogopslag een (kwalitatieve) uitkomst zien.

CONCLUSIES EN UITKOMSTEN

- Zorg voor een formele bespreking van het resultaat en deel de uitkomst én vervolgacties met tenminste de deelnemers of nog beter de hele organisatie.

FOLLOW UP

HOE NU VERDER?

Is de KNG goed bevallen en heeft deze nieuwe inzichten opgeleverd, dan wil je ongetwijfeld verder op het ingeslagen pad. Je kunt uiteraard meerdere KNG sessies organiseren met andere teams. Het is natuurlijk ook mogelijk om de KNG onderdeel te maken van je standaard projectstart. Wil je uitgebreidere analyses van het resultaat maken of nog een stap verder met sociaal kennismanagement, neem dan contact op met GuruScan (info@guruscan.nl).

BIJLAGE 1 – VOORBEELD EMAILS VOOR DE KNG

De KNG is een workshop die zonder begeleiding gedaan kan worden. Degene die de workshop leidt (workshopleider) zal tijdig iedereen moeten uitnodigen en uitleggen wat de bedoeling is. Dat kan uiteraard tijdens een vergadering of teammeeting gebeuren, maar zal ook vaak per email plaatsvinden. Als handreiking voor de workshopleider hebben we een aantal e-mails geschreven die je zou kunnen gebruiken. Let er op dat je de e-mails altijd even doorleest en aanpast aan je eigen organisatie en de specifieke datum, tijd en locatie dat je de KNG gaat doen!

De e-mails

- Uitnodigingsemail
  - Deze email verstuur je naar het (project-) team waarmee je de KNG wilt gaan doen.
  - Je verstuurt deze email ongeveer 6 tot 4 weken voor de KNG
  - Deze mail gaat naar iedereen die je wilt uitnodigen, dit kunnen meer dan 12 personen zijn.
- Bevestigingsemail
  - Deze mail verstuur je om iemand te laten weten dat je zijn aanmelding hebt ontvangen.
  - Deze mail kun je direct na de aanmelding van een individu versturen OF als je zeker weet dat je voldoende aanmeldingen hebt en dan direct naar alle deelnemers.
  - Deze mail wordt dus alleen verstuurd naar de aangemelde deelnemers.
- Herinnering 7 dagen
- Deze mail verstuurt je om de deelnemers te herinneren dat volgende week de KNG plaatsvindt
- Je verstuurt deze mail 7 dagen voor de KNG
- Deze mail gaat naar de (aangemelde) deelnemers aan de KNG

- **Herinnering 1 dag**
- Deze mail verstuurt je om de deelnemers te herinneren dat volgende week de KNG plaatsvindt
- Je verstuurt deze mail 1 dag voor de KNG
- Deze mail gaat naar de (aangemelde) deelnemers aan de KNG

- **Bedankmail**
- Deze mail verstuurt je om de deelnemers te bedanken voor hun deelname. Schrijf hierin kort de bevindingen van de workshop én de follow-up die is besproken.
- Je verstuurt deze mail zo kort mogelijk (max 1 dag) na de KNG
- Deze mail gaat naar alle deelnemers aan de KNG.

- **Resultaten email**
- Deze mail verstuurt je om de resultaten te delen.
- Je verstuurt deze mail uiterlijk 7 dagen na de KNG.
- Deze mail gaat naar alle teamleden die je hebt uitgenodigd + relevante stakeholders.

**UITNODIGINGS EMAIL**

*Aan:* alle teamleden

*Onderwerp:* GuruScan Knowledge Network Game voor “ons team”

Hallo teamleden,

Bij deze nodig ik jullie uit voor de GuruScan Knowledge Network Game op 22 mei van 10:00 tot 12:00 uur in de Blauwe Kamer. Laat me even weten of je hier bij kunt zijn?

*Waarom*

Omdat we “net gestart zijn / op afstand van elkaar werken / een aantal nieuwe teamleden hebben / etc”, is het soms lastig om te achterhalen wie wat weet binnen het team. Het is nog ingewikkelder om inzicht te krijgen in elkaars (kennis-) netwerk binnen en buiten de organisatie.

*Wat*

De GuruScan Knowledge Network Game is een praktisch en snel middel om inzicht te geven in wie wat weet binnen ons team, en wie wie kent vanuit ons team. Tijdens de workshop maken we een kennis gedreven netwerkanalyse van ons team en de directe omgeving daar omheen.

*Hoe*

De KNG is een workshop die ik faciliteer op “22 mei van 10:00 tot 12:00 uur in de Blauwe Kamer op het hoofdkantoor.” Om tot een nuttig resultaat te komen zullen we hier samen aan moeten werken. De KNG faciliteert maximaal 12 deelnemers.

Laat me even weten of je hier bij kunt zijn. Ik zie er naar uit om dit waardevolle inzicht te creëren en ben benieuwd naar de kennis en het netwerk van ons team.
Met vriendelijke groet,
De Workshop leider

BEVESTIGINGS EMAIL

Aan: bevestigde deelnemer(s)

Onderwerp: Bevestiging deelname KNG

Beste “voornaam achternaam”

Bedankt voor de bevestiging van je deelname aan de KNG op 22 mei van 10:00 tot 12:00 uur in de Blauwe Kamer op het hoofdkantoor.

Ik zie er naar uit je daar te zien

Vriendelijke groet,
De Workshop leider

HERINNERING 7 DAGEN

Aan: (alle) bevestigde deelnemers

Onderwerp: KNG volgende week

Beste Teamleden

Jullie hebben je aangemeld voor de KNG van volgende week. Het ziet er zeer veelbelovend uit omdat het hele team zich heeft aangemeld. Ik zie er naar uit om jullie allemaal volgende week te zien.

Vergeet niet in je agenda te zetten: Dinsdag 22 mei van 10:00 tot 12:00 in de Blauwe Kamer van het hoofdkantoor.

Met vriendelijke groet,
De Workshop leider

BEDANK EMAIL

Aan: alle deelnemers

Onderwerp: Bedankt voor je deelname aan de KNG

Beste KNG deelnemers,

Super veel dank voor je deelname aan de KNG vandaag. Bij deze alvast een snel resultaat en een korte vooruitblik op wat je nog kunt verwachten.

We hebben een kennisnetwerk opgebouwd voor ons team, gebaseerd op 11 kennisgebieden. Het verraste me om te leren hoe belangrijk hardware voor sommigen binnen het team is!
Op deze 11 kennisgebieden hebben we gezamenlijk 240 kennisverwijzingen gegeven waarvan er 97 naar ons eigen team gingen en 143 naar de 45 experts buiten ons team die genoemd zijn.

Het verheugde me dat we zo goed verbonden lijken te zijn met de rest van de organisatie. De enige afdeling die we lijken te missen is Verkoop.

In de komende week zal ik de resultaten opschonen, interpreteren en vastleggen. Daarna stuur ik ze volgende week naar jullie en de overige belanghebbenden (i.e. de directeur, BU manager en Verkoop). Deze resultaten worden in ieder geval tijdens het MT van 15 juni besproken.

Vriendelijke groet,

De Workshop leider