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Preface

This master thesis project was developed in corporation with the Company and the University of Technology in Delft. The thesis project is part of the master program “Management of Technology” at the faculty Technology, Policy and Management (TPM) and is supported by the sections Organizational Behavior and Innovations (OBI) and Information and Communication Technology (ICT).

A knowledge management project, e.g. KM project, was performed within the Company. The organization was chosen, because of the potentials of the organization for a case study; the type of organization; the biotech industry and the situation in which the Company was situated. Over the last two years, the Company has experienced some turbulent times. In 2006, the Company merged with two organizations, which made it an interesting organization in to execute a KM project.

The topic knowledge management was chosen, because I believe that it is an emerging discipline within organizations, the concrete use of which will play a vital part in the performance of the organizations. Knowledge management was also intriguing, because it helped to explain the way people act and interact within an organization and why they have certain behaviors. The course “Management of Technology (MoT)” supported the understanding and analysis of the three departments of the Company and its problems. A MoT person should be able to interact between the researchers and managers. The course provided the means and tools to adapt and act within the organization, to perform a study and understand the technology and managerial issues. The course supported the various elements of an organization, such as knowledge management (KM). The MoT course and knowledge management provided the tools for “how” to apply technologies within organization, and illustrated that technology cannot solve all problems, but that it

also depends on people and how well they use the tools. The whole research process was a learning experience.

During the thesis project, I was supported and supervised by O. van H (the Company) and Desiree Hoving (TU Delft). I would like to thank these persons for their contribution, effort and time. I would like to thank Professor Robert Verburg for chairing the graduation committee and for his support and valuable input during the whole process. I would also like to thank my second supervisor Jan van den Berg for his support and valuable feedback. My thanks go to the Company, and the research participants at the Company for the opportunity to perform the thesis project and their contribution to the KM project. Finally, I would like to thank Miranda Aldham-Breary for reviewing my English, and my family and friends for their support during the whole period.

Executive summary

Knowledge sharing, knowledge storage and knowledge retrieval are often simple within small organizations compared to large organizations. It often becomes more difficult to find, share, store and retrieve knowledge from an appropriate person, when the size of an organization increases and, therefore, the amount of knowledge. This happened within the Company. The Company is a knowledge intensive organization and their main asset are the organizational members of the R&D department. The Company set out to search for solutions and recognized the potential benefits of knowledge management (KM). The goal of KM is to enhance the intellectual capital and the performance of the organization by utilizing technology and considering the culture environment. A KM project was launched within the Company. The goal of the KM project was to recommend suitable KM practices for the Company to increase the performance of the organization. To analyse the organization, a case study was carried out within the library, scientific affairs department (SAD) and the communications department (CD). Interviews were held with seven organizational members from these departments. The KM process "sharing" was chosen for optimization by the participants and researcher. Furthermore, several problems were identified during the interviews, which can be associated with a lack of sharing within the organization and departments. According to the participants of the departments, the problems identified are: a lack of goals and strategy; a lack of feedback from other organizational members; a lack of internal and external knowledge and information sources; an islands structure within the company; obstruction by copyright rules to share information; the inability to find, store and share knowledge and information effectively; a lack of sharing structures; a lack of contact between the supervisors of the library and the CD and the members of the library and CD; little willingness to share knowledge within the R&D department; informal agreements regarding gathering of information from the medical library of the University of Leiden;

confidentiality of information; a lack of on-time information within the CD; a lack of capacity and time within the CD; changes in supervision within the CD; adhocism within the CD.

Tools, systems and technologies were recommended to deal with the problems found within the departments. The recommended KM solutions consist of defining goals and strategy for the departments, the use of a document management system (DMS), which uses a portal, RSS feeds and a meta-search engine. Notification and authorization are also incorporated within the DMS. A collaboration tool which incorporates a discussion forum, to support social networks is recommended. A change of folders structure, external RSS feeds, rewards, additional staff, investments and meetings were also recommended to overcome the problems of the departments and stimulates knowledge sharing. The DMS should be used to share information between the three departments. A portal is part of the DMS and connects the single databases of the departments. RSS feeds are used to notify, direct and indirect, organizational members regarding information. RSS feeds personalize the information for the organizational members, which reduces the information overflow. Metadata should be assigned to the information to classify the information and a meta-search engine allows the organizational members to retrieve the correct information. A meta-search engine is part of the DMS. Authorization should prevent sharing of information with unauthorized organizational members. The collaboration tool is used to share less structured information and supports networks among organizational members. Organizational members could share explicit knowledge with other organizational members via the discussion forum. The current folder structure of the library should change and is part of the portal. Authorized organizational can find and retrieve the scientific articles via the meta-search engine. External RSS feeds are used to obtain online information, which can be vital for the organization. RSS feeds visualize updates of information or websites. Meetings should be

organized to increase the involvement with the organization and the transfer of tacit knowledge. The KM tools should be supportive to the organizational members. The KM tools are often useless without the organizational members. Organizational members should be willing to share knowledge and information. Therefore, rewards should be given to stimulate organizational members to share information and knowledge. Additional organizational members are needed to decrease the adhococracy of the CD. More time becomes available to perform its task more effective and efficient. Investments are needed to formalize the gathering of information from the medical library of the University of Leiden.

Additional KM practices were incorporated for the Company to implement KM companywide, because some proposed KM practices were less relevant for the case study, while some KM practices were relevant for a long-term view, success and benefits of KM within the Company. The recommended KM practices focused on networks between organizational members. A personalized approach was recommended, because of the organizational dynamics and organizational aspects, such as organizational culture, product and vision. Furthermore, a change in behaviour should occur. Organizational members and the higher management should recognize the benefits of KM and knowledge sharing. The disadvantage within the KM field is a lack of proper measurement tools. In the end of the research, KM solutions were evaluated using a survey. The participants accepted the KM solutions. To conclude, it is a combination of KM tools and organizational members.

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1. Introduction

In this introduction background information is provided regarding the Company, the case study and the research. The chapter incorporates a problem statement and describes the goal of the research. The information was used to determine the scope of the project and creates a notion regarding the Company and the case study. In the end, the structure of the thesis report is discussed.

1.1. Introduction of the Company and the Case study

The history, the mission, goals and strategy, the locations, product and financial status of the Company are discussed, which creates a notion about the Company as a company. The problem statement is then presented from which the goal of the research is diverted. The problem statement is introduced to describe “why” this research was conducted. A case study was used to analyse the problem and perform the research. The case study was conducted in three departments of the Company. A description of these departments is given.

1.1.1. The Company

1.1.1.1. History of the Company

The Company is a biotech company that was founded in the year 2000. The company originated from a merge between two organizations. The Company acquired two other organizations in 2006, which served to strengthen the position of the Company within the vaccine market. The mergers had an impact on the organization, because the company went from approximately 150 employees to 1100 employees and shifted from a mainly R&D based company to a more production based company.

1.1.1.2. Mission, Goals and Strategy

A mission statement, goals and a strategy are important for an organization, because they provide structure and perspective for the organization, its departments and their organizational members. The mission statement of the Company includes the development, production and marketing of vaccines that can be used to combat infectious diseases worldwide (The Company, 2007, Fact Sheet).

The goal of the Company can be derived from the mission statement. The goal of the Company is "to improve healthcare throughout the world by fighting infectious diseases." (The Company, 2007, Fact Sheet). The Company is also striving to create optimum value for its shareholders (The Company, 2005, Annual Report).

The business strategy can be derived from the goals of the Company. The strategy of the Company is to apply its own technologies to develop antibodies and vaccine products. The development, manufacturing and marketing of these products is done by discovering, researching and creating technologies, vaccines and antibodies. The Company uses its own infrastructure for in-house development, production and marketing to accomplish the goal of the organization. The Company also make use of partnering with other companies and organizations. This allows the Company to develop products and share costs and risks. Furthermore, the Company licenses its core technologies to other companies in the biotech industry in the areas that are of no interest for the Company (The Company, 2007, Form 20-F 2006).

1.1.1.3. Locations

The headquarters of the Company is located in the Netherlands. The remaining subsidiaries are located in Switzerland, Sweden, Spain, Italy, United States, Argentina, China and Korea. The main research is performed in the Netherlands. The facilities in

Switzerland, Sweden, Spain and Korea used as manufacturing sites. The Company is extending its production capacity by establishing a production facility in the Netherlands. This facility will be used for small scale production whereas the remaining manufacturing locations are used for large scale production. The facilities in Italy, United States, Argentina and China are used for marketing and sales.

1.1.1.4. Products

The product portfolio of the Company consists of vaccines and antibodies for infectious diseases. The Company has increased its product portfolio due to the mergers. The Company did not had products on the market before the mergers. Nowadays, the Company has six vaccines on the market, which protects against Hepatitis A and B, typhoid fever, influenza diphtheria, tetanus, whooping cough, bacterial meningitis and diarrhea caused by cholera and Escherichia Coli. Other vaccine products are being developed by the R&D department of the Company and should protect against influenza, Hepatitis A, Yellow Fever, West Nile, Ebola, Malaria, and Tuberculosis. The antibody products are also being developed by the R&D department of the Company. Research is presently being undertaken into rabies and factor V.

1.1.1.5. Financial

The Company is listed on the Euronext, NASDAQ and the Swiss Exchange. The net losses of the Company of the last 6 years are equal to €24 million, €55.7 million, €23.4 million, €21.3 million, €15.5 million and €87.6 million respectively for 2001, 2002, 2003, 2004, 2005 and 2006 (The Company, 2003, Annual Report and The Company, 2006, Annual Report). According to the Chief Executive Officer (CEO), the Company expects to reach the break-even point in the end of 2007. The total revenues of the Company of the same corresponding last 6 years were €9.1 million, €9.6 million, €7.4 million, €18.1 million, €32.7 million and €131.6 million (The Company, 2003, Annual Report and The Company,

2006, Annual Report). The main revenues before the merges were generated by the licensing their technology to other biotech companies. The main revenue after the merges were generated by product sales.

1.1.1.6. Problem statement

One of the advantages of small companies is that knowledge sharing, knowledge storing and knowledge retrieving is often relatively simple. Every employee knows where to find the appropriate knowledge and employee. However, this could change when the size of the company increases. This often results in more employees being situated within the company, which makes it more difficult to find, share, store and retrieve knowledge from the appropriate people. This is currently happening at the Company. The mergers in 2006 increased the amount of employees by 700% and, therefore, increased the amount of knowledge held within the organization. Within the Company, organizational members could benefit from up-to-date knowledge and information regarding projects, products and research held by other organizational members. However, such knowledge and information is difficult to obtain as it is scattered across different locations within the organization. The lack of knowledge sharing, knowledge storing and knowledge retrieving prevents organizational members to performing their task effectively and efficiently.

1.1.1.7. Goal of the research

The Company started searching for solutions after it identified the problem of sharing, storing and retrieving of knowledge within the organization. The Company recognized the benefits of knowledge management (KM) and launched this KM project. The goal of the thesis project was to give recommendations regarding suitable KM practices for the Company, which enable the Company to improve the performance of their organization.

1.1.2. Case study

A case study was used to investigate the problem of the Company with respect to storing, sharing, finding and retrieving of knowledge. A case study is a method to narrow the scope of the project and incorporated three departments of the Company, the library, the scientific affairs department (SAD) and the communications department (CD). An organization chart is presented in figure 1-1, which illustrates the locations of the departments within the organization and the numbers of participants within this project, see shaded boxes.

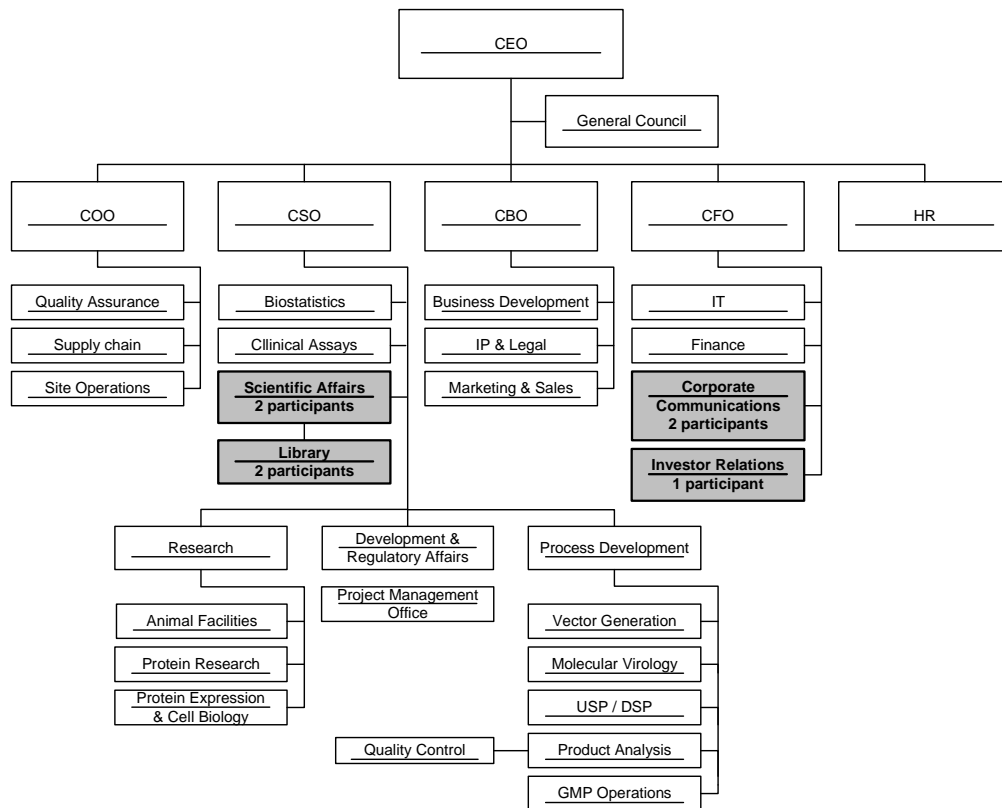


Figure 1-1, Organization chart of the Company

The reason for choosing these departments was that these departments often experience problems with knowledge finding, knowledge sharing, knowledge storing and knowledge

retrieving, which affects the performance of their tasks. The three departments are supportive to the operational departments of the Company and depend on the operating departments. An introduction of the three departments is provided in the following sections.

1.1.2.1. Library

The library has two members and is supervised by the scientific affairs department (SAD). The librarians are responsible for the handling of requests for scientific articles. The Company library differs from public libraries in the sense that it is more service-orientated and does not store or collect large amounts of books. The library has displays that includes scientific and department related magazines and stores a small amount of books in closed cabinets. The library is located in the centre of the building and all members of the organization have access to the library.

1.1.2.2. Scientific Affairs Department

The SAD is controlled by the chief scientific officer (CSO) of the Company. The department consists of four persons. The first person is responsible for the SAD. This person develops, coordinates, controls and evaluates presentations and articles. The remaining three persons are analysts and support the SAD. They support the evaluation of presentations and articles. The SAD is located near the CEO and CSO.

1.1.2.3. Communications Department

Four persons are located within the communications department (CD), and they report to chief financial officer (CFO). The CD is responsible for internal and external communications. The department incorporates investor relations, public relations and internal communication. The first participant is the supervisor of the department, the second participant is responsible for the investor relations (IR), the third participant is

responsible for internal communication and public relations (PR) and the fourth person of the CD is an editor. The CD is located on the same level as the management.

1.1.3. Structure of the report

An introduction of the Company, a problem statement, the goal of the research and the case study is given in chapter 1. Chapter 2 incorporates the used theory, which allowed the researcher to perform the analysis and reached the objectives of the research. Chapter 2 starts with a discussion of various organizational models followed by a discussion of various aspects of knowledge management (KM). Organizational aspects, which could influence the choice of the KM practices, are also considered in chapter 2. The research questions are presented throughout chapter 2. In chapter 3, the methodologies of the research, desk research, interviews and a survey, are elaborated. The results of the analysis are discussed in chapter 4. Chapter 4 incorporates a description of the current KM practices and culture of the Company as well as an in-depth description of the three departments, their relationship and its specific problems. The KM solutions for the specific problems of the departments are presented in chapter 5. The KM solutions were evaluated by the group of participants. The results of the evaluation are discussed in chapter 6. Finally, an overall conclusion and recommendations are given in chapter 7.

2. Knowledge Management

This chapter provides a theoretical framework for the investigation. The first section discusses a organizational model, because the research was performed within an organization and divides the organization into different elements, which simplifies the analysis regarding the organization. The second part of the chapter discusses the different aspects of knowledge management (KM), consisting of a discussion of different type of knowledge, KM definitions, KM strategies, KM processes and KM practices. The type of knowledge and KM definition are used to relate the organization with KM. The KM strategy, KM processes and KM practices are part of a model, which contributes to the analysis of the organization and recommendation of the KM practices. The organizational aspect "culture" is considered, because it supports the fit of the KM practices. A conclusion is drawn in the end of the chapter.

2.1. Organizational models

Several organizational models exist within the literature. Examples of authors that had developed an organizational model are Mintzberg (1989), Leavitt (1978) and Weggeman (1985). The model of Mintzberg (1989) consists of five organizational elements, which are strategic apex, middle line, operational core, technostructure and supportive staff. The model of Mintzberg (1989) can be used for all kind of organizations. Leavitt's diamond (1988) describes of four organizational elements, which are structure, technology, people and task. The organizational model of Leavitt (1988) focuses often on the redesign of an organization. Although the organizational models of Mintzberg (1989) and Leavitt (1988) can be used to analyze the Company, the choice is made to use the integrative organizational model of Weggeman (1985), because it provides a relation with KM, which simplifies the research. The model of Weggeman (1985) can be used to

analyze knowledge intensive organizations (KIO's). According to Weggeman (1997), a KIO is:

A knowledge intensive organization is an organization that has, mainly, knowledge workers in the primary processes of the organization. The knowledge workers inventory, creating, integrating, sharing, applying and evaluating knowledge to accomplish the objectives of the organization and satisfying internal and external stakeholders (Weggeman, 1997).

The Company has the characteristic of a knowledge intensive organization. The model of Weggeman (1985) also allowed the researcher to perform a qualitative research. The organization can be divided into several elements and segments, which allowed the researcher to perform an in-depth analysis. The integral organizational model of Weggeman (1985) includes three segments, which are organization, formalization and realization. The organizational model is presented in figure 2-1.

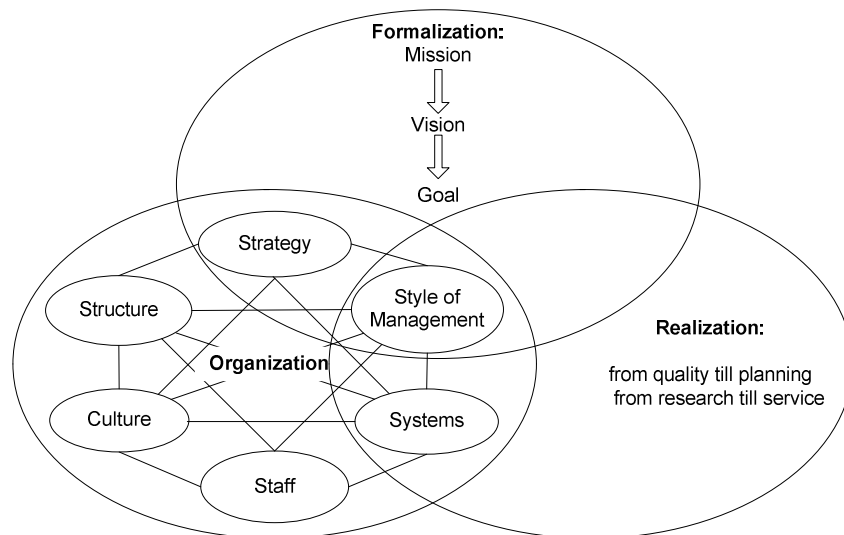


Figure 2-1, integral organizational model of Weggeman (1985)

The top segment in figure 2-1 is formalization and incorporates the mission, vision and goals of the organization. The mission of a firm often describes the reason “why” the organization should exist (Weggeman, 2000). According to Weggeman (2000), the vision is derived from the mission and includes the future perspective of the firm. The goals of the firm are often derived from the vision. The goals describe “what” should be accomplished in a certain time period (Weggeman, 2000). The segment formalization was added by Weggeman to emphasize the environment of the firm.

The lower left segment in figure 2-1 is organization. According to Weggeman (2000), “organization” is the creation of conditions that allows the firm to produce a service or product, which allows the firm to achieve their goals. The segment “organization” incorporates the 7s-model of Athos and Pascale (1981), which was elaborated by Peters and Waterman (1982) (Weggeman, 2000). Organization supposed to be the main part of the model. As shown in the figure, the seven elements of the “organization” are strategy, style of management, systems, staff, culture and structure. The elements are described in table 2-1.

Table 2-1, organizational elements and description of the elements

Element	Description
Strategy	How the goals are accomplished
Style of management	The behavior and knowledge of the management
System	The facilitation of technical systems and a collection of rules and procedures that support the daily activities of the organizational members
Staff	The characteristics of the organizational members

Element	Description
Structure	How the responsibilities and authorizations are divided among the members of the organization
Culture	The way we do thing around here (Deal and Kennedy, 1982)

The segment realization is located in the lower right corner in figure 2-1. Weggeman (2000) describes realization as the departments of an organization and its primary and secondary processes, which are research till services departments and quality till planning processes. The physical company consists of several departments and different processes. Members of the organization are located in the departments and execute their specific tasks. Different processes are often developed and associated with these tasks.

According to Weggeman (2000), the segments formalization, organization and realization are interrelated. The segment "formalization" and "organization" are connected via: the goals, the strategy and the style of management. From a management perspective, the transition of the goals is often via strategy. The strategy can be derived from the goals. The segments "organization" and "realization" are connected via style of management, systems, the departments and their processes. Realization incorporates the way tasks are executed in the firm, given the goals and arrangement of the firm. Systems allow organizational members to execute their tasks and the arrangements of the departments and processes depend on the perspective of the management. The connection between the segments "formalization" and "realization" supposed to be via goals, style of management, departments and processes. The way the goals are achieved depends on "how" the tasks are performed, which depend on the arrangement of the firm. The goal of the firm determines the goals of the departments and, therefore, has influence on the processes and tasks within the departments. To conclude an organization is a dynamic

system. The segments organization, formalization and realization are interrelated, because each segment affects another segment. The elements are interrelated, which implies that if one element changes, other elements are affected and could change. The interrelation of the segments and elements should be taken into account when recommending suitable KM solutions for the Company.

2.2. Knowledge Management

Different knowledge management (KM) features are discussed to be able to analyse the problem and recommend suitable KM practices. All KM features within an organization can be associated with knowledge, information and data. Therefore, an explanation of and distinction between knowledge, information and data are given. The KM definition is used to relate KM and the organization. Then, a model to improve an organization is presented. The model incorporates the KM features, KM strategy, KM processes and KM practices. The different KM strategies, codification and personalization, are discussed followed by a presentation of different KM cycles, which incorporate KM processes. The section "KM practices" incorporates tools to overcome the problem at the Company. The KM practices should fit the organizational aspects of the Company. Therefore, organizational aspects are discussed.

2.2.1. Data, Information and Knowledge

All kind of data, information and knowledge exists within the organization. Members of the organization often need data, information and knowledge to perform their daily tasks. Tools are often used to transfer the data, information and knowledge. Data is described as *known facts or things used as a basis of conclusions or calculations* (Jashapara, 2004). According to Ackoff (1989), *data is raw. Data can exist in any form, usable or not. It*

does not have meaning of itself. Information can be derived from data and is illustrated as *structured data* (Jashapara, 2004). The data can transform into information, which can be interpreted by members of an organization. According to Ackoff (1989), *information is data that has been given meaning.* This information can become knowledge and is described as *actionable information* (Jashapara, 2004). According to Ackoff (1989), *Knowledge is the appropriate collection of information, such that its intent is to be useful. This knowledge has useful meaning to them.* The knowledge often allows organizational members to act and anticipate on situations within an organization. Data, information and knowledge are separate entities, because of their meanings. A description of data, information and knowledge was given to be able to develop suitable KM practice.

According to Polanyi (1966), knowledge can be divided into two types, tacit knowledge and explicit knowledge. Tacit and explicit knowledge are often described as respectively "know-how" and "know-what" (Jashapara, 2004). Tacit knowledge is often hard to formalize and to communicate, whereas explicit knowledge is often transferred into formal and common language (Polanyi, 1966). Polanyi (1966) explained the differences between tacit and explicit knowledge by the famous example of "riding a bicycle".

When people can ride a bike, they can stay upright. However, when they experience that they may fall, they will correct the motion by turning the steering of the bike. However, most people cannot explain which way they must turn, left or right, to prevent the fall when riding the bike. So, everybody who can ride a bike knows, which way to turn the handlebars to prevent a fall, but cannot say which way to turn. (Polanyi, 1966)

Tacit knowledge is explained by Polanyi (1966) as what is known by “everyone” to keep the bike upright. It is knowledge that a person possesses, however, only possessing the tacit knowledge is often not sufficient enough. According to Polanyi (1966), explicit knowledge also exists. Explicit knowledge can be illustrated as the example of riding the bike itself, the knowledge to recognize a bike or to know “how” to use the peddles (Polanyi, 1966). A person could describe in detail how a bike works, but could not be able to ride the bike. Both types of knowledge are separated entities and are complementary, but they are not interchangeable (Polanyi, 1966). The distinction between the type of knowledge could influence the choice of KM practices and, therefore, taken into account, when designing the KM practices.

2.2.1.1. Conversion and transformations of knowledge

The previous example of Polanyi (1966) illustrated that persons could possess tacit and explicit knowledge. Organizational members should often communicate to produce a product or service and thereby transferring tacit and explicit knowledge. An organizational member could possess and transform the explicit and tacit knowledge. Nonaka (1994) developed a model of transformations for the two types of knowledge, see figure 2-2.

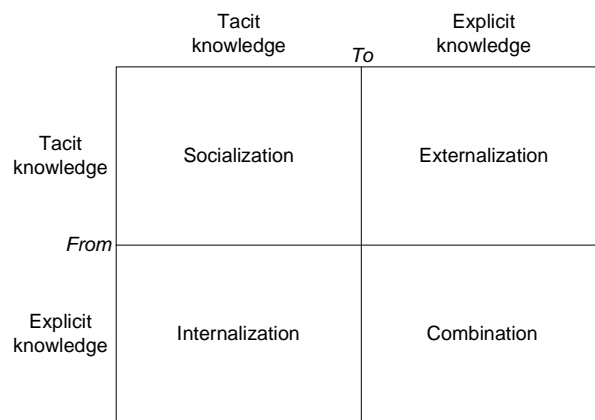


Figure 2-2, Modes of knowledge conversion (Nonaka, 1994)

The model consists of four modes of knowledge conversion. These modes are (1) socialization, (2) externalization, (3) combination and (4) internalization. Socialization describes the transformation from tacit knowledge to tacit knowledge. The tacit knowledge is often gained through imitation and observations and can be acquired without language (Nonaka, 1994). The transformation of tacit knowledge to tacit knowledge could occur via interaction or observation among individuals. Externalization explains the transformation from tacit knowledge to explicit knowledge. Descriptions, metaphors and examples can be utilized to transform the tacit knowledge of an individual into explicit knowledge. An individual can transfer tacit knowledge into explicit knowledge through interaction. The third mode is "combination" and illustrates the conversion of explicit knowledge into explicit knowledge. The combination mode involves the use of social processes to combine the different sources of explicit knowledge by individuals (Nonaka, 1994). The explicit knowledge is often transferred via verbal communications, documents or electronically. Internalization represents the transformation from explicit knowledge to tacit knowledge. Internalizations include the process of learning. Explicit knowledge can be used to learn and transformed into tacit knowledge. A person can internalize the knowledge. Tools could support the transformations of knowledge by individuals.

Groups could also possess tacit and explicit knowledge. The KM practices that are going to be recommended should take into account that tacit and explicit knowledge could be possessed by individuals or within groups. An individual can be seen as single person, whereas groups consist of, at least, two persons or more. Cook and Brown (1999) made a distinction between knowledge, tacit and explicit, of an individual or a group could possess.

2.2.2. Knowledge Management Definitions

Knowledge management definitions, e.g. KM definitions, illustrate the objectives of KM and connect KM and an organization. According to a study of KPMG (2000), 81% of the leading corporations in Europe and the US has considered or adopted knowledge management system. According to the KPMG study (2000), the reasons to apply KM system was to gain competitive advantage (79%), to increase market effectiveness (75%), to develop a customer focus (72%) or to improve product innovations (62%) (Cabrera, 2002). This is from a information system perspective.

Jashapara (2004) made a distinction between different perspectives within KM definitions. KM definitions could have a focus on information systems, such as in the KPMG study (2000), but also on human resource processes, strategy (Jashapara, 2004). According to Jashapara (2004) and Davenport and Prusak (1998), an integrative perspective should be adopt, to be able to improve within the KM research field, because the single perspectives would be insufficient in themselves. According to Jashapara (2004), KM has often different dimensions, which are illustrated in figure 2-3.

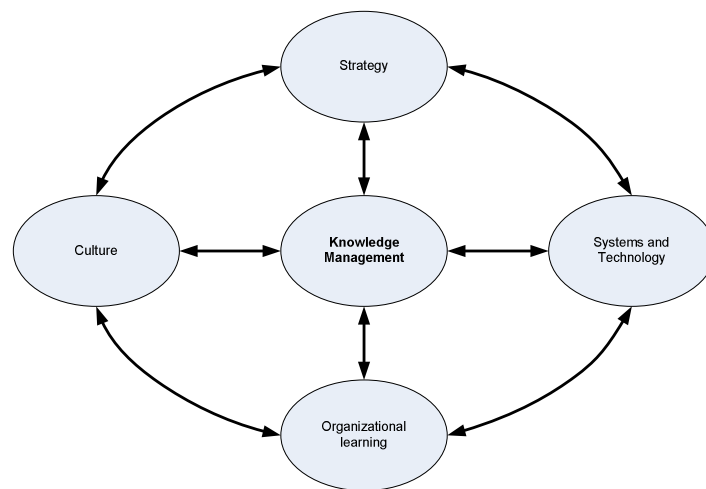


Figure 2-3, KM dimentions (Jashapara, 2004)

An integrative approach is used within this report, because it incorporates all KM dimensions and, therefore, all KM perspectives. Systems and technologies are often useless, when organizational members do not want to use the systems and technologies. All kinds of KM practices regarding strategies, HR processes or information systems can be recommended to the Company to improve the organizational performance. KM definitions are illustrated by O'Dell (1993), Hibbard (1997) and Jashapara (2004). The KM definition of O'Dell (1993) is not be used, because a more resource based perspective would be wishful given the goal of the research. O'Dell describes more what KM is, instead of relating it to improving the performance of an organization. The definition of Hibbard (1997) is not used, because it does not incorporate all dimensions of KM. According to Jashapara (2004), all dimensions should be incorporated to improve within the KM field. The KM definition of Jashapara (2004) incorporates all KM dimensions. The applied KM definition is:

Knowledge management enhances the intellectual capital and performance of the organization by utilizing appropriate technology and considering the culture environment, as a result of an effective learning processes that includes the exploration, exploitation and sharing of human knowledge (tacit and explicit) (Jashapara, 2004).

The KM project recommends suitable KM practices to the Company, which enable the Company to improve the performance of the departments. The long-term view focus of the Company is to improve the overall performance of the organization to gain competitive advantage, improve product innovations and increase market effectiveness.

2.3. Improvement within organizations

This research focussed on improving three departments of the Company by recommending knowledge management practices, e.g. KM practices. The model of Verburg and Hoving (2007) provides an overview of improving innovations within organizations by looking at knowledge processes. The model of Verburg and Hoving (2007) is illustrated in figure 2-4.

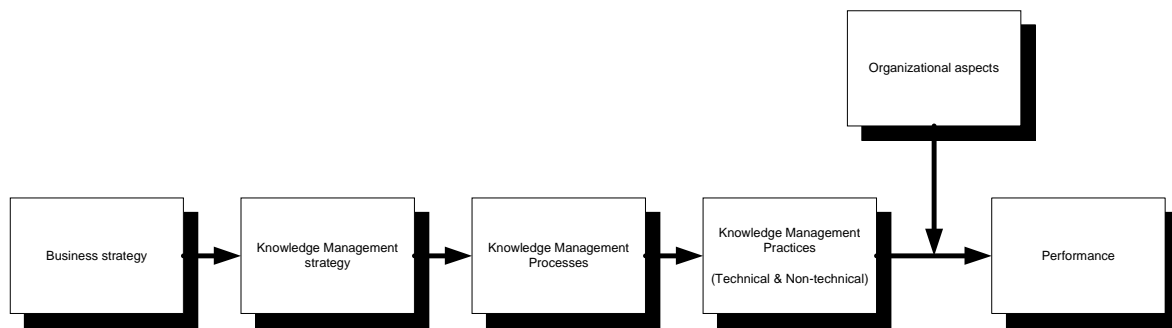


Figure 2-4, Improvement within organizations (Verburg and Hoving, 2007)

The model fits the third generation of KM. The first KM generation was based on internal efficiency and was IT driven (Jashapara, 2004). Systems to capture, codify and store explicit knowledge were used. After acknowledging that not all knowledge could be codified, the focus shifted to the transfer of tacit knowledge between persons. The second KM generation focused on the transfer of tacit knowledge. The second KM generation was human-led and focuses on differentiation (Jashapara, 2004). The third generation of KM is a combination of the first and second KM generation and focussed on innovations. Sharing of knowledge via networks became important and was the key to innovations. Paraponaris (2003) illustrated the third generation as a “market driven approach with a networking practices”. The third generation combined technology and human elements. According to Verburg and Hoving (2007) “current innovations

processes involved networks of organizations, rather than single organization". Therefore, the model can be related to the third generation of KM.

The focus of the model of Verburg and Hoving (2007) is on the KM processes. A single KM process is often chosen for optimization to simplify the analysis and improve the network. Processes are often easier to improve. The choice of KM process depends on the need and deficiency of the organizations. The model could also be applied within an organization. The different departments and their organizational members create a network. The different elements and segments of a firm are interrelated, see figure 2-1. KM processes can be identified within an organization. Organizational aspects have influence on the KM practices, because it should fit the organization. Organizational members should be willing and able to use the KM practices. The main research question is derived from the model of Verburg and Hoving (2007) given the goal of the project. The main research question is:

Which knowledge management practices fit the knowledge management processes and organizational aspects?

The different KM elements of the model of Verburg and Hoving (2006) are elaborated in the following sections. The business strategy is assumed to be given.

2.3.1. Knowledge Management Strategies

Hansen (1999) made a distinction between two KM strategies, which were the codification and personalization strategy. The codification strategy is often linked to the first KM generation. The codification strategy is often characterized by efficiency and technology. As the word "codification" already implies, the codification strategy focuses

on codifying, storing and dissemination of knowledge. Hansen (1999) describes the codification strategy as a “people-to-document” approach. Companies that follow the codification strategy often invest heavily in search and retrieval tools and database technology.

Companies that follow the personalization strategy often invest in practices that allow people to interact in a dialog. It focuses more on the transfer of tacit knowledge and is often related to the second KM generation. Instead of storing knowledge in databases, the personalization strategy utilizes tools to stimulate communication and sharing of knowledge. According to Hansen (1999), the personalization strategy is described as a person-to- person approach.

Hansen (1999) stated that organizations have to make a choice between the KM strategies. According to Hansen (1999), a personalization strategy consists of 20% codification and 80% personalization, whereas a codification strategy contains 20% personalization and 80% codification. The choice of KM strategy depends on the several organizational aspects. Some of these organizational features supposed to be the mission, vision, goals, business strategy, kind of product, type of knowledge (Hansen, 1999) and organizational culture. Elements of the model of Weggeman could also influence the choice of KM strategy, such as organizational members and structure of the firm.

2.3.2. Knowledge Management Processes

Several knowledge management processes, e.g. KM processes, can be identified with an organization. Authors that describe KM processes are Weggeman (1997), O’Dell (1996) and Wiig (1993). Jashapara (2004) described seven KM processes, which are (1)

discovery, (2) generating, (3) evaluating, (4) sharing and (5) leveraging of knowledge and are part of a KM cycle. The KM cycle of Jashapara (2004) is used in this research, because it can be linked with the type of organization and the biotech industry. The Company is an R&D organization that wants to be innovative by discovering, researching and creating technologies, vaccines and antibodies. Discovery and generation are situated within this innovation process. Evaluating, sharing and leveraging of knowledge are also located within the organization and biotech industry. The KM processes also include more detailed processes, such as organizing, retrieving and storing of knowledge, which contributes to the objective of the research. The KM processes of Jashapara (2004) are more generic and simplifies the analysis. The KM cycle represents a flowchart of operational KM processes. Within a KM cycle, one KM process initiates another KM process. The KM cycle of Jashapara (2004) is shown in figure 2-5.

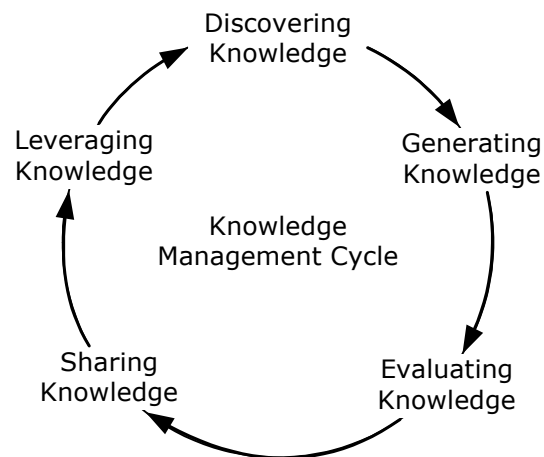


Figure 2-5, Knowledge management cycle of Jashapara (2004)

Jashapara (2004) describes the KM processes as:

- *Discovering*: discovery is associated with the new knowledge and insights by an individual

- *Generating*: generating is associated with “how” the knowledge is gained
- *Evaluating*: knowledge should be evaluated, because not all knowledge is relevant for the different disciplines within an organization
- *Sharing*: the KM process “sharing” consists of the dissemination of the knowledge throughout the organization
- *Leveraging*: leveraging of knowledge incorporates the (re)use the “new” knowledge

The first sub-question is associated with the KM processes and can be derived from the model of Verburg and Hoving (2007). The sub-question supports the main research question. The first sub-question is:

1. Which knowledge management process should be improved?

A more in-depth study regarding the KM process “sharing” is performed in the following section. Indications regarding a lack of sharing of knowledge within the Company were found during the orientation phase of the KM project. Therefore, sharing dilemmas, sharing criteria and success factors of sharing knowledge are discussed.

2.3.2.1. *Sharing of knowledge*

An explanation regarding “why” knowledge is often not shared within an organization will be given in this section. Cabrera (2002) argue that the knowledge sharing dilemmas can be explained by the phenomenon “social dilemma”. Individuals often try to maximize their personal profit within a social dilemma, however, the behaviour of the individual leads to collective loss. An example of the social dilemma comes from the fishing industry.

It is assumed that fishermen are paid by the amount of fish they catch and that fast and efficient methods were found and applied by the fishermen to catch more fish within the same period of time. fishermen's profit (individual) increases, because of the efficient methods. The more fish they caught, the more they get paid, which allowed the fishermen to support their families and buy more and expansive goods. However, the rate of fishing is not in equilibrium with the reproduction of the fish, which had led to a diminishing of the fish stock and the extinction of certain fish types in specific areas, such as the codfish in the North Sea (Europese Commissie, 2007). So, there will be no fish left for the fishing industry in the end (collective) due to the behaviour of single fishermen's.

The social dilemma can be divided into two types of dilemmas, which are (1) the resource dilemma and (2) the public-good dilemma (Cabrera, 2002). The resource dilemma is described as the "collective cooperation that leads to a serious threat of the reduction of future resources" (Cabrera, 2002). The public-good dilemma is described as "a shared resource from which everybody may benefit, despite the personal contribution to its supply and whose availability does not diminish" (Cabrera, 2002 and Olsen, 1965). Knowledge is such resource that can be shared, but does not diminish. Ideas and methods of others can be used to increase personal performance or status, but will not decrease the value of another person's knowledge (Cabrera 2002). An organizational member can maximize personal knowledge by using the collective or organizational knowledge, but the organizational member is often not obliged to participate in the contribution to the organizational knowledge. The personal use of organizational knowledge will not diminish the knowledge of the organization. An effort should be made by the organizational member to share knowledge with an individual or group, however, when the benefits are smaller than the effort required to contribute, the cost of the

contribution is too high. This lack of benefits leads to non-sharing behaviour on behalf of the individual.

2.3.2.2. *Sharing barriers*

An increase in performance and intellectual capital does not emerge spontaneously by investing in KM systems. Multiple reasons can be brought forward as to “why” knowledge is often not shared by organizational members and, therefore, a discussion of the barriers to sharing will be held. Weggeman (2000) identified knowledge-sharing barriers. According to Weggeman (2000) the organizational members are often not motivated to share knowledge due to:

- weakening of position
- a knowledge gap between the sender and the potential receiver
- uncertainty regarding the value of the knowledge
- a lack of respect of the sender for the receiver (senior vs. junior)
- a lack of respect from receiver for the sender
- a lack of motivation by the receiver to learn (no benefits)

Other barriers also explain “why” knowledge sharing cannot be shared by organizational members. From an IT perspective, reasons for not sharing knowledge according to the KPMG study (2000) are:

- a lack of understanding of the benefits of the IT system
- the employee cannot incorporate sharing of knowledge within their daily work
- insufficient understanding of the IT system
- a lack of time

- the employee may not recognize the personal benefits of sharing knowledge a lack of support by the management

These barriers should be taken into account when recommending KM practices. Otherwise, a negative attitude towards KM, poor return of investment (ROI) and resistance could be the result. According to the KMPG study (2000), it could also threaten the benefit of investments in KM. The following section incorporates criteria to overcome these barriers to sharing knowledge.

2.3.2.3. *Sharing criteria*

According to Coleman (1999), an organization should comply with certain criteria to create a successful sharing environment within the organization. Organizations have the tendency to focus on technical solutions instead of non-technical solutions, although, non-technical solutions are equally important. According to the study of McDermott (2001) and Coleman (1999), successful organizations did not change the culture to fit KM within the organization, but designed a KM tool that fits the culture. This is also the approach of this research. According to Coleman (1999), an organization needs meet the following criteria for successful adaptation of KM:

- trust
- freedom to communicate and with enough understanding to transfer meanings
- a general context or language
- a goal for sharing
- the ability to interact in an informal manner with another
- autonomy to share
- a flexible organizational structure that supports knowledge sharing
- the infrastructure to support knowledge and information sharing

Furthermore, Coleman (1999) performed a benchmark to determine the success factors for a collaborative and knowledge-sharing environment. The benchmark was performed at several top US organizations. Additional criteria can be drawn from the list of success factors. The criteria are:

- the organization should believe that collaboration is critical for the future
- the management should participate and support collaboration
- the organizations should believe that significant (economic) benefit can be gain by collaboration
- the organization should be able to visualize the economic benefits of the collaboration
- the organization should visualize KM towards the organization

These criteria can be used to stimulate organizational members to share knowledge. KM practices should be available to support sharing of knowledge.

2.3.3. Knowledge Management Practices

Knowledge management practices, e.g. KM practices, are illustrated as actions or operations, such as changing the tires of a bicycle. Tools are necessary to be able to change the tires. KM practices also incorporated tools. KM practices illustrate the way KM tools are used. KM tools can be used to stimulate discovering, generating, evaluating, sharing and leveraging of tacit and explicit knowledge between organizational members. The KM tools support the KM processes. The KM tools are discussed in the following section.

2.3.3.1. Knowledge Management Tools

From an information system perspective, some knowledge management tools, e.g. KM tools, incorporate KM systems. Jashapara (2004) describes several KM systems, which are a document management system, decisions support system, group support system, executive information system, workflow management system and a customer relationship management system. An explanation of these KM systems is given in table 2-2.

Table 2-2, Knowledge Management Systems (Jashapara, 2004)

System	Description
Document Management System	A document management system (DMS) delivers the right information at the right time to the right person. Knowledge can be stored, searched and retrieved from the DMS.
Decision Support System	A decision support system (DSS) supports the decision-making processes. Within a DSS, knowledge is created and evaluated.
Group Support System	A group support system (GSS) or groupware supports collaboration of groups within the organization. GSS enhances the communication, sharing, cooperation and coordination of groups and knowledge.
Executive Information System	An executive information system (EIS) allows executives to access information and knowledge, which supports the decision making process (e.g. strategic and control).

System	Description
Workflow Management System	A workflow management system (WMS) allows planning and control of workflow and resources within a firm. Knowledge can be capture, stored and retrieved from a WMS regarding these processes and resources.
Customer Relationship Management System	A customer relationship management System (CRM) is applied to develop knowledge regarding customer's preferences and needs.

These KM systems can contain KM technologies to organize, capture, evaluate, share and store information and tacit and explicit knowledge, because knowledge is often gained from information. A KM system could contain several KM technologies. Knowledge can be organized according to an ontology or taxonomy. Ontologies organize knowledge by looking at the relationship between different knowledge domains. Taxonomies organize knowledge according to a hierarchical classification of knowledge domains. Knowledge domains consist of general topics.

Capturing knowledge can be done by cognitive mapping tools, information retrieval tools, search engines, agent technologies and personalization technologies. Cognitive mapping tools create representations of knowledge domain and their relations. An example of a cognitive mapping tool is mind mapping. Information retrieval tools can be used to retrieve the proper and correct information for the user. Information retrieval tools can do a full text search, via indexes or via metadata. Metadata is data about data (Turban, McLean and Wetherbe, 2004). A search engines could searches via full-text or indexes, whereas a meta-search engines searchers primarily on metadata. The (meta) search engines can make use of agent technologies. Agent technologies can perform autonomous actions to accomplish their design objectives. Another example of the use of

agent technology is a real simple syndication feed, e.g. RSS feed. RSS feeds often personalize information flows. Personalization technologies allow the user to capture tailored made information.

Case-based reasoning (CBR), online analytical processing (OLAP), data mining and machine learning are technologies that can be used to evaluating knowledge. CBR can be used to acquire and store historical information. The historical information can be use to solve problems in the future. OLAP can represent information from different perspectives and angles and shows the relationship between different entities. Data mining can be used to discovery knowledge in databases. Machine learning can be used to discover little known problems regarding a specific domain.

Sharing of knowledge can be done via the internet, intranet, extranet, text-based conferences, video conference, yellow pages, face-to-face, E-learning and groupware tools. Internet, intranet and extranet allow a user to share knowledge, respectively, on a global level, local level and global/ local level. Text-based conferences allow a user to communicate and share knowledge via texts. Examples of text-based conferences are forums, discussion boards, chat, email and wiki's. Communicating and sharing knowledge via visual and audio is known as video conferencing. Yellow pages can be used to find the appropriate organizational members and their skills, expertise and interests. E-learning is online learning (Jashapara, 2004), which allows, for example, experts to share knowledge with inexperience members. Groupware tools incorporate some of the "sharing" technologies and face-to-face allows direct transfer of knowledge, person to person.

Data warehousing allows a user to store knowledge. Data warehousing is referred to databases that contain a variety of information sources, which can be used to find and

retrieve “new” information. It is a neutral storage area and allows analytical tools to analyse the information (Jashapara, 2004). Information can be visualized via visualizations (graphic, pictures, ect), from which knowledge can be gained.

From a HR perspective, other KM tools can be used to stimulate, coordinate and manage organizational members to discover, generate, evaluate, share and leverage tacit and explicit knowledge. These KM tools are appraisals and rewards, training and development, recruitment and selection, rules and policies. These features allow an organizational member to perform a task.

Appraisals and rewards can be used as an incentive to stimulate organizational members. Appraisals and rewards can be monetary (e.g. bonus), physical (e.g. car or pension) and social recognition (e.g. status or medals) (Jashapara, 2004; Cabrera, 2002). According to Cabrera (2002), constructing a pay-off function increases the benefits of sharing of knowledge. Appraisals and rewards can be used within the pay-off function. Training is another tool to stimulate the KM processes of discovering, generating, evaluating, sharing and leveraging of knowledge. Training is a formal mechanism to distribute knowledge (Alavi, 2001). Training can be used to modify the attitude, knowledge and skills of an organizational member (Jashapara, 2004). Training often focus on the short term learning processes, whereas, development often focus on the long-term learning processes. Development can leads an individual to new understandings and insights. Recruitment and selection are tools that can be utilized to select and hire the appropriate people. Recruitment and selection focus on the fit of a person and the correct position of the person within the organization. Rules and policies can steer organizational members towards certain behaviour. Rules and policies can be used to allow or restraint certain actions or tasks of the organizational members. HR rules and policies can be developed to support sharing cultures within the organization.

2.3.3.2. *Knowledge Management Practices and Knowledge sharing*

Several KM tools can be applied to stimulate knowledge sharing within a organization. A few examples are presented to stimulate and increase knowledge sharing within an organization. The KM practices are increasing efficacy, creating a group identity and personal responsibility and creating social networks (Cabrera, 2002 and Alavi, 2001). The KM practices stimulates knowledge sharing are discussed, because indications regarding a lack of knowledge sharing were found during the orientation fase.

Increasing efficacy

Sharing of knowledge can be stimulated by increasing efficacy of knowledge sharing (Cabrera, 2002). The organizational members are more willing and cooperative to contribute knowledge when the objective of knowledge sharing is clear and, thereby, increasing the perceived value of knowledge sharing. Providing feedback to contributors, ensuring a critical mass of participants, training and technology increases the efficacy (Cabrera, 2002).

Creating group identity and personal responsibility

Group identity and personal responsibility are forms of social control and can be used to maintain cooperation within a group (Cabrera, 2002). Managers can increase the sense of group identity, commitment and identifiably by encourage communication, establishing communities of practices and making information regarding the employees' contribution available (Cabrera, 2002).

Creating social networks

Tacit and explicit knowledge can be transferred via informal channels (Alavi, 2001). The transfer can occur during social drinks, coffee break discussions, formal seminars and informal meetings (Alavi, 2001). These social networks enhance the personal

relationships between members of the organization. Cross (2001) made a distinction between ineffective and effective relationships and identified four features for social networks. According to Cross (2001), it is important that (1) an organization member knows what another person knows, (2) is able to gain access to the person in time, (3) willingness to participate and (4) a degree of safety in the relationship should be provided. A variety of KM tools could support social networks.

Furthermore, suitable KM practices were recommended to improve the performance of the Company. However, a range of KM practices is available within the literature. Some KM tools can be related to the KM dimensions "information systems and technology" whereas other can be related to the HR dimensions. Both types of KM tools are important to develop suitable KM practices for the Company. The second sub-question is associated with KM practices and can be derived from the model of Verburg and Hoving (2007). The second sub-question supports the main question. The second sub-question is:

2. Which knowledge management practices can be applied?

According to Verburg and Hoving (2007), organizational aspects have influence on the performance of the KM practices. They affect the choice of KM practices. Cultural is one of the organizational aspects and is discussed in the following section.

2.4. Organizational aspects

One of the organizational aspects is culture. Other organizational aspects are the mission statement, vision, goals of the organization, business strategy, the type of product current structure and systems and organizational members. Furthermore, culture is one of the dimensions of KM and is part of the HR perspective. A more in-depth description of

the culture is given, because it has influence on KM and the KM practices. Furthermore, culture can influence knowledge sharing within an organization. Therefore, a link between culture and knowledge sharing is given in the end of this section.

2.4.1. Culture definition

Hofstede (1991) distinguished between six levels of culture. According to Hofstede (1991) culture can manifest on a national level, regional level, gender level, generation level, social class level and organizational level. Organization culture is used during this KM project, because the research was conducted within an organization. Different definitions regarding organizational culture were described in the literature, such as Weggeman (2000), Hofstede (1991), Shein (1985) and Deal and Kennedy (1982). Although the definition of Weggeman (2000), Hofstede (1991) and Shein (1985) could be used, the culture definition of Deal and Kennedy (1982) is used in this research, because of a previous cultural research within the Company. Deal and Kennedy (1982) describes organizational culture as *"way we do things around here"*. According to Jansen (2006), the definition described the process that can be associated with culture. These processes are often more familiar and often more simple to describe by the organizational members. This allows the researcher to obtain the information for the culture report and simplifies the research. The culture research focussed on the desirable culture within the Company by determining the current and future organizational culture. Our research is inline with the recommendations of the culture study (Jansen, 2006) and does not obstruct future research or changes with the Company. Furthermore, the word "culture" is used as a synonym for "organizational culture" throughout the thesis report.

2.4.1.1. *Organizational culture and Knowledge sharing*

The organizational culture can be use to stimulate knowledge sharing within an organization. Organizational members can be encouraged to share knowledge by aligning the organizational culture and knowledge sharing (McDermott, 2001). McDermott (2001) describes KM practices for aligning the organizational culture and knowledge sharing. Organizations could:

- create a visual link between sharing knowledge and practical business goals, problems or results
- create a match between the overall style of the organization to knowledge sharing
- develop a link between sharing of knowledge and the core values of the firm
- use members of the organization that support knowledge sharing to encourage and pressure other members to share knowledge
- create and enhance networks between members of the organization

These criteria can contributes to increase the success of knowledge sharing within the organization. The message can be visualized to the organization. Organizational members can identify themselves with the KM project and sharing of knowledge.

2.5. Summary

Several KM aspects related to organizations are discussed within this chapter. Choices between different definitions and models were made. Therefore, a summary of the chapter is provided. The integrative organizational model of Weggeman (2000) was used to investigate the organization of the Company, because it has a link with KM and contributes to a qualitative research of the problem of the Company.

The integrative KM definition of Jashapara (2004) is applied within this thesis report, because it contains the different perspectives regarding KM. The different perspectives are human resource, strategic and information system perspective or a combination of the three perspectives. The strategic purpose is to enhance the performance of the organization. Information systems can be used to enhance the organizational performance, but are often insufficient on their own. Therefore, a human resource perspective should also be incorporated.

The model of Verburg and Hoving (2007) is used in this KM project. The model illustrates a process to increase innovations within organizations and networks of organizations. The model focuses on KM processes of these organizations and networks. A KM process should be chosen for optimization. The KM cycle of Jashapara (2004) was selected to describe the KM processes. The KM processes are more generic and incorporates other KM processes, such as capturing, organizing, storing and retrieving. The KM processes fits with the organization. KM tools are often used to support the KM processes.

Furthermore, the KM project was performed within an organization and, therefore, an organizational culture definition was chosen. The organization culture definition of Deal

and Kennedy (1982) is used during this research, because of the culture research of Jansen, which was conducted within the Company.

The main research question and sub-questions of this research were derived from the model of Verburg (2007). The research questions are:

- Which knowledge management practices fit the knowledge management process and organizational aspects?
- Which knowledge management process should be improved?
- Which knowledge management practices can be applied?

3. Methodology

A variety of methods were used to execute the research and gain information regarding the problems of the Company and departments. Therefore, an explanation of the methodologies used is given in the following sections. This chapter deals with to the questions "how" the knowledge management (KM) study was performed within the Company. Three types of methodologies are discussed, desk research, an interview and a survey. Figure 3-1, illustrates the different stages in which the methodologies were used.

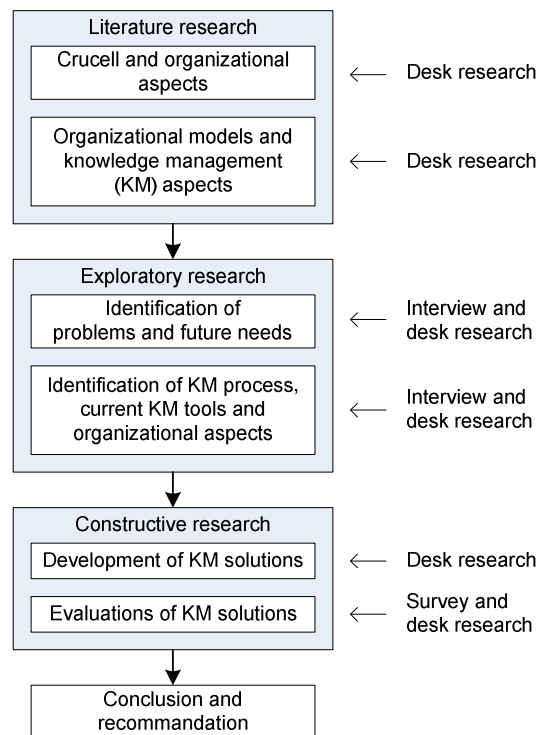


Figure 3-1, Research approach

The methodologies were incorporated within a case study. A case study was chosen, because of the limited time and quality of the research. The scope of the KM project would be too broad to conduct a more qualitative research, throughout the whole organization. A more in-depth research could be performed by utilizing a case study. The

case study was performed in three departments of the Company, which are the library, the scientific affairs department (SAD) and the communications department (CD). The departments are often involved in the process of collecting, transforming and sharing of information and knowledge before its externalized. They depend on other departments to perform their tasks. The increase of the size of the Company affected the departments.

3.1. Desk research

Desk research includes literature research and secondary research (Verschuren, 2005). Literature research was used in this research, because it created a notion regarding the Company and various aspects of knowledge management (KM). Desk research makes use of existing literature (Verschuren, 2005). Annual reports, facts sheets, a culture study and other internal documents of the Company as well as a literature from the library of the University of Delft were used within this research. The literature from the library of the University of Delft included scientific articles, books and papers.

3.1.1. Why desk research

The information obtained during the desk research provided the opportunity to learn, understand and develop in-depth insights within the Company and of KM. For example, internal documents allowed the researcher to understand "how" an organization has developed, works and was structured. The information gained from the internal documents allowed the researcher to determine the structure of the organization, its organizational culture, current KM practices, financial data, amount of employees and locations of the facilities. No KM practices could be developed without understanding the organization into which they will be introduced. A notions regarding the Company was developed by using desk research.

Literature research from the library of the University of Delft was used to create a framework for the investigation by exploring and applying theoretical literature regarding organizational aspects and various KM aspects. The models and methodologies presented in the literature allowed the researcher to perform a analysis regarding KM and the organization. Furthermore, the theoretical literature provided KM tools, which could be recommended to the Company. Therefore, desk research contributes to the recommendation of these KM practices.

3.2. Interview

An interview was developed and conducted with seven participants divided over the three departments. Two participants of the library and SAD and three participants of the CD were used during separate formal meetings. The benefits of interviews are the little predetermined structure and open way of questioning (Verschuren, 2005). This allowed the researcher and participants to give more in-depth clarifications regarding the discussed topics. The interviews were used to aid a problems analysis, evaluate the current tools, organizational aspects and contributed to the choice of the optimizing KM process. Questions regarding the topics, business strategy, KM processes, KM practices, organizational culture and knowledge domains of the three departments were asked. The interviews also contained questions about the future needs of these departments.

3.2.1. Why interview

Interviews allowed the researcher to structure an analysis the problems and needs of the departments within this research. Every participant was asked the similar questions, which allowed the researcher to compare the answers of the participants. The benefit of interviews is often the interaction between the research and participants (Verschuren,

2005). The participants had the freedom to elaborate on topics and the researcher has the opportunity to clarify questions and ask for clarifications of answers, as not all problems could be captured by a predetermined questions. The interviews also allowed the researcher to detect non-verbal communication. Another reason to use interviews was the number of participants. Interviews are often used within small groups. A disadvantage of interviews is the amount of time that has to be invested to carry out a thorough interview. Developing an interview, arranging appointments with participants for the interviews, developing transcripts and analyzing the results consumes often a lot of time.

3.2.2. Interview questions and answers

Twenty-eight questions regarding the topics business strategy, KM processes, KM practices, organizational culture and knowledge domains were asked during the interviews. The interviews were recorded and transcripts of the interviews were developed. The questions and the answers were arranged in a table and checked by the participants. The table can be found in appendix A.

3.3. Survey

The third methodology that was used during the KM project was a survey. The survey was used to evaluate the KM solutions. A survey has an extended degree of structure and closed questions (Verschuren, 2005). A survey allows a researcher to ask structure questions and compare results. The disadvantage of a survey is often that a participant's reactions can not be observed and the answers cannot be explained or elaborated by a participant. Another disadvantage is that questions often cannot be clarified by the researcher, when a participant does not understand a survey questions. Therefore, it is

essential to provide good questions and explanations of what is required of the participant as they answer a survey.

3.3.1. Why survey

Surveys are often used to perform quantitative research in which a large group of participants is questioned. The size of the group could be too large to conduct interviews or the participants can be decentralized. A survey was developed and executed for the KM project although it does not comply with the previous criteria. The first reason to conduct a survey was a lack of time. Interviews could take too much time in comparison with a survey. KM solutions were already developed, which gave the research the opportunity to ask closed questions regarding the KM solutions.

3.3.2. Survey questions and answers

The survey and answers are given in appendix B. Explanations were presented and questions regarding the KM solutions were asked in the survey. The explanations introduced the KM solutions and the survey questions were used to analyze "how" satisfied the participants were with the KM solution on a scale of 1 till 5. The shaded boxes include grades, which were attached by the participants to the KM solution. The scale of grading is from 1 till 10 and represents the overall value of the KM solutions. Furthermore, every participant was asked to grade the KM solutions and the participants had the ability to incorporate short comments regarding the KM solutions.

4. Analysis of results

A general description is given regarding the current KM tools of the Company and the Company's culture. These aspects support the development of suitable KM practices. Then, an in-depth description of the departments, library, scientific affairs department (SAD) and communications department (CD) followed by a description of the relation between the departments, which contributes to the notion of the departments. The knowledge sources and domains are discussed, because they influence the design of the KM practices. Then, a KM process will be selected for optimization, followed by and their specific problems. A discussion of the department's problems and the interrelationships of the problems of the single departments is presented. A summary is given in the end of the chapter in which the similarities among the three departments are outlined.

4.1. Description of the Company

An overview of the current KM practices, e.g. KM practices, is provided, which supports the recommendation of the KM practices. The second section includes a discussion of the organizational culture of the Company.

4.1.1. Knowledge Management Practices

There are several KM practices used within The Company. Assuming that a lot of KM practices were added to the organization due to the mergers in 2006, it became impossible to capture all the KM practices of the whole organization. An overview of the tools, systems and technologies, used at the facility in the Netherlands, is presented.

The used tools, systems and technologies at The Company are:

Technology

- internet
- intranet
- yellow page, e.g. Who-is-Who
- video conference, e.g. Webex and Webcast
- text-based conference, e.g. Sametime and email

- conference calls

System

- Lotus Notes (GSS)
- NuGenesis (WMS)

Tools

- MS Office
- press releases
- newsletter
- memo
- files servers
- external databases

- informal meetings
- formal meetings
- statistical and financial software
- social drinks
- internal presentations
- external presentations
- rewards
- training
- policies

These tools, systems and technologies support the daily tasks of the organizational members. Internet is used to stay up-to-date, search and find information and gain new explicit knowledge and information. Intranet is used to inform and find organizational members. Explicit knowledge regarding the organization and organization members can be gained by the intranet. The internet and intranet supports the externalization, combination and internalization of knowledge. The intranet includes a yellow page, webcast, announcement and general documents. Webcast is not only used to inform organizational members, but also external stakeholders. Webex, e.g. videoconference, and conference calls are used to communicate between facilities and their environment. It supports formal meetings across large distances. Tacit and explicit knowledge can be transferred and gained by using Webex.

Lotus Notes can be applied as a group support system (GSS), however, it is used for sending and receiving emails and text-based conferences, e.g. SameTime. According to the IT department, Lotus Notes will be extended as a GSS in the future. Lotus Notes allows the organizational members to transfer explicit knowledge and information. The knowledge can be externalize, combine or internalize via Lotus Notes. NuGenesis is a platform for collecting, storing, securing and managing of scientific data and information. NuGenesis is used by R&D department to store raw data and reports. Other departments use this information for analysis. NuGenesis allows the Company to track the development of a product. NuGenesis has characteristics of a WMS. Explicit knowledge can be transferred gained from NuGenesis. Organizational members can externalize, combine and internalize the knowledge.

MS Office includes Word, Excel, Powerpoint, Visio, and Access. These programs enable the members of the organization to develop documents, presentations, figures and perform calculations. Organizational members can externalize, combine and internalize knowledge by utilizing the programs. Press releases, memos and newsletters are often used to inform internal and external stakeholders. Explicit knowledge can be transferred by these tools. The file server allows the organization to store and share information and data. External databases are used to extract and collect media clippings and scientific literature. Explicit knowledge can be gained from the file server and database. Statistical and financial software are often used to analyze the results of the R&D department and to manage the cash flow of the organization. Explicit knowledge can be gained by utilizing the software. The software supports the processes of externalization, combination and internalization of knowledge. Informal and formal meetings can be internal or external and are often used to inform the organizational members, project groups or the organization and external stakeholders. Informal meetings are often held

during the coffee break or in offices. Tacit and explicit knowledge and information can be shared with each other during these meetings. Meetings often support the socialization of knowledge. Furthermore, tacit knowledge and information can be gained and transferred during social drinks. Every month a social drink is organization by the Company to allow organizational members from different departments to meet and share knowledge with another. The social drink is an informal event. Social drinks often support the process socialization of knowledge. Internal and external presentations are often given to inform internal and external stakeholders. Internal presentations are given among the researcher to inform each other regarding projects and the research. External presentations are given on events, schools or seminars and are used to inform, for example, shareholders or students. Presentations supposed to be transferring explicit and tacit knowledge. Monetary rewards are used by The Company to reward the performance of an organizational member. Rewards are use to encourage the organizational members to perform. Training is often used to transfer and gain knowledge. Explicit and tacit knowledge can be gained and transferred during training sessions. The training can be internal or external. HR policies are used to steer and manage organizational members. Persons can be allowed or retrained to perform certain actions.

These tools, systems and technologies are often used to share, communicate, cooperate and coordinate tacit and explicit knowledge within and outside the firm and between individuals or groups. The tools, systems and technologies that are described above are the main tools, systems and technologies within the organization. Other tools, systems and technologies could be available within the organization, but were not identified.

4.1.2. Culture

One of the organizational aspects and dimensions of KM is culture. Culture is one of the elements that had impact on the recommendation of the KM practices. Therefore, a more in-depth description of the organizational culture is given. The culture study of Jansen (2006) is the basis the culture research of this thesis report. According to the study, the culture of the Company is an adhocracy culture (Cameron and Quinn, 2006). Other possible types of culture are a hierarchical culture, a market culture and family culture (Cameron and Quinn, 2006). According to Jansen (2006), an adhocracy culture is associated with flexibility and individuality. Keywords of the adhocracies culture are innovative, dynamics and creativity (Jansen, 2006). These elements can be found within the Company. The adhocracy culture can be related to the guiding principles of the Company. The guiding principles were developed by the management and illustrated "how" the members of the organization should work, behave or act. The guiding principles described the way organizational members should do things within the organization. According to the Company's guiding principles (2007), the management stimulates entrepreneurship and believes that it enables creativity and innovations within the Company (The Company, *Guiding Principles*, 2007). The members of the organization have a lot of freedom, but are accountable. According to Jansen (2006), organizational members are held together by their involvement in innovations and product development. The success criteria of the Company are based on having unique products and winning in the market (Jansen, 2006).

No formal structure exists within the Company. There are often short lines between management and the three departments. The current structure of the organization causes dynamics within the organization. The mentality of the members of the

organization can be described as a “can do” mentality, which is communicated throughout the organization. The mentality indicates the way of working within the Company. The mentality says that nothing is impossible. New changes, sources and opportunities can be explored by the members of the organization. This behaviour often caused dynamics within the organization and allows organizational members to be creative and innovative. The leaders of the organization are illustrated as innovative and as entrepreneurs (Jansen, 2006). They often dare to take risks. This attitude can be due to the type of industry, in which the Company is situated. A lot of time and money is often involved in the development of biotech products. Risks should be taken by the management to accomplish the goal of the organization.

Currently, the Company changed from a R&D based company into a vaccine producing company. According to Jansen (2006), the culture should be changed towards a more hierarchical orientation organization, but should not undermine the flexibility innovative and creativity of the members of the organization. Lesser high-educated researchers and more lower-educated staff are needed, which could change the processes within the organization, see chapter 2. Clear and formal regulations and a more stable structure within the organization are asked by the organizational members (Jansen, 2006). This includes more formalization of tasks and processes. A summary of the cultural study of Jansen (2006) can be found in appendix C.

4.2. Case study

A description of the tasks, current KM practices and culture of the library, scientific affairs department (SAD) and communications department (CD) are presented to create a more in-depth understanding regarding the departments. Then, the relation between the

departments is discussed, given the tasks of the departments. Therefore, information flows and knowledge domains are discussed. The choice of KM process is introduced after the discussion of the relation between the departments. Eventually, the specific problems of the departments are presented. The problems were indicated by the participants of these departments and can be associated with the chosen KM process. A conclusion is drawn in the end of each section. The conclusion relates the problems of the separate departments. An overall conclusion relates the problems of the three departments.

4.2.1. Library

4.2.1.1. Task

The task of the library was to provide information, particularly scientific articles and publications, with and without request to internal customers. The main customer of the library was the R&D department. First, members of the organization conduct a self-search before information is requested. When the correct information is found, the member ask the library to provide this information. The library can access and supply the information better due to better accessibility to online databases.

The request for information could be provided on paper, by email or via verbal communication. The library accessed the correct external database and searched for the information. When the information was found, it was stored in a public folder that was located on a shared driver. The public folder contained a folder of the project or research group. Another folder was located with the name of the customer within the group folder. After the information was stored, the library informs the customer via link in the email.

Most of the time, the library provides information on request, particularly scientific articles and publications. However, when the library detected information of interest, the library offered this information without request to the organizational member. Another opportunity was to request general information regarding a specific topic. The information is not specified in comparison with a request for a scientific article. For example, general information regarding the subject "flu" can be requested. The library conducts a search for this information and setup an email alert. This kind of request was often used by the SAD. Sometimes, scientific articles were requested by the SAD whereas the CD did not request information from the library.

4.2.1.2. Knowledge Management Practices

The library used several web-based databases to search for information. The main databases were Pubmed, the medical database of the University of Leiden and the Elsevier database "Science Direct". To share the information, a general folders structure was used, which was located on a shared driver. Email and informal gathering were used for communication and sharing of information between the library and its customers. Within the department, informal meetings were held among the participants of the Library.

The future KM practices should fit the departments. Therefore, criteria for KM practices were asked during the interviews. According the library, the user requirements for a system are authorization, feedback and speed.

4.2.1.3. Culture

The library of the Company was more service-orientated then a public library. The library was facilitating, informal, open and accessible for all members of the organization. The

librarians were service-orientated, open and willing to support its customers. The communication was informal among the employees and between the library and their customers.

4.2.2. Scientific Affairs Department

4.2.2.1. Task

The scientific affairs department (SAD) was responsible for scientific publications. The scientific affairs department (SAD) was established, because incorrect information was published in the past. The task of the SAD was to verify the accuracy and reliability of the publications and presentations. The publications could be in scientific journals, at seminars and/or media. The internal customers of the SAD were the CSO, the business development department and the communications department (CD). The department gathered information from the library and R&D department, prepares presentations for the CSO and verified presentations and articles of the business development and CD on their scientific accuracy.

4.2.2.2. Knowledge Management Practices

The used KM tools of the SAD are MS PowerPoint, MS Word and statistical software such as SPSS, SAS and Prism. These KM tools were used for developing presentations and to evaluate articles and R&D information. Email was often used often to share information. A local folder structure enabled storing and sharing of information within the department. Other KM practices that was used between the employees and their customers and among the members of the department were informal and formal meetings and verbal communication. They were used to communicate and share information.

Furthermore, questions regarding future criteria for the recommended KM practices were asked. According to the SAD, the user requirements for a system are a single platform, accessibility, authorization, qualification, feedback and tagging of the information.

4.2.2.3. Culture

The SAD could be illustrated as a facilitating department, because they depend on other departments. According to the participants, the SAD was informal, open and helpful. Most of the members have been there since the foundation of the Company and, therefore, have a lot of experience from the past. Informal communication was often used between the employees and between the department and their customers. The members of the SAD were direct and flexible.

4.2.3. Communications Department

4.2.3.1. Task

The communications department (CD) was responsible for internal and external communication. It keeps the internal and external stakeholders informed. The internal stakeholders were the members of the organization and external stakeholders were often the investors, analyst and shareholders. Information was gathered by the CD from the R&D department and higher management, especially from the CFO. External information was collected from web-based databases. The information was often used for the development of articles, presentations and newsletters. The SAD verified these articles, presentations and press releases on their scientific value, because members of the CD did not have a scientific background. There was a knowledge gap between the CD and their customers.

4.2.3.2. *Knowledge Management Practices*

The CD often use a newsletter, memos and intranet to keep the internal stakeholders informed. External customers receive information via seminars, presentations, webcasts and press releases. The CD utilized email to communicate and share knowledge. Within the department, conference calls, informal meetings and verbal communication were often used to share knowledge and information. A local folders structure enabled the participants to store, structure and share information within the department. Internal information was gathered via meetings, lobbying and self-search. Lexis Nexis was an external information source, which was often used to collect external information, especially media clips. Media clips are articles that are written by the media about the Company. The media clips were store within the local folder structure of the department and were arranged by subject and date. The databases of the NASDAQ and Euronext were used by the Investor Relations (IR) to gather external information.

The recommended KM practices should comply with needs and criteria of the participants. Therefore, questions regarding the user requirements were asked during the interviews. According to the CD, the user requirements for a IT system are a single platform, authorization, qualification, speed of the system, accessibility, usability, feedback.

4.2.3.3. *Culture*

The CD was a supportive department, because it depends on others departments. According to the participants of the CD, keywords of the culture were ad hoc, informal, open, flexible and supportive. The CD had a short line with higher management, meetings were not often scheduled and occur on an ad hoc basis.

4.2.4. Relation between the departments

The departments were depending on the input of other departments. Information and knowledge was shared to be able to accomplish the tasks of the departments. The relation between the departments is presented in figure 4-1.

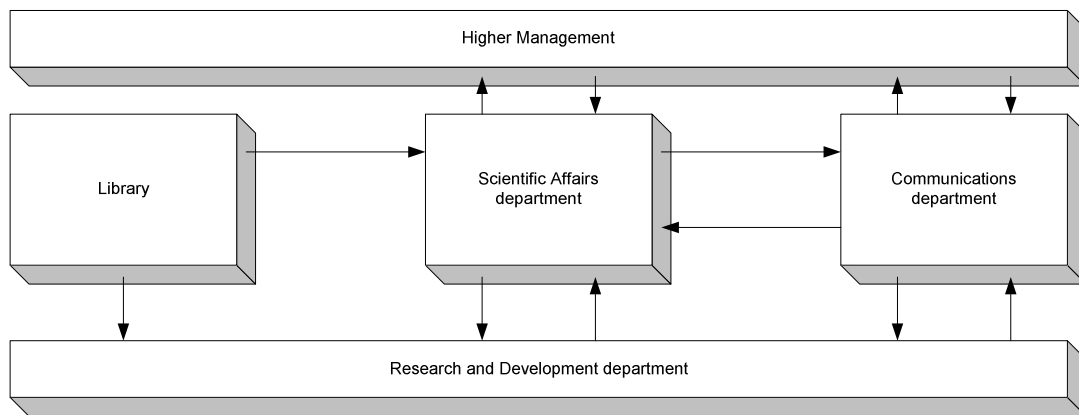


Figure 4-1, Relationship between the library, SAD and CD

Figure 4-1 illustrates the information flow between the departments. However, this process was not optimal and, therefore, KM practices were recommended. According to the participants, informal communication and email were often used. As shown in figure 4-1, the library provided information towards the SAD and the R&D department. No feedback is given by the SAD and the R&D department towards the library regarding this information. The SAD shares information with and receives information from the CD, R&D department and higher management, especially from the chief science officer (CSO). The CD shares information with and receives information from the SAD, R&D department and chief financial officer (CFO) and other members of the higher management. Knowledge and information is also gained and collected from other sources.

4.2.5. Knowledge sources and Knowledge domains

The organizational members of the library, scientific affairs department (SAD) and communications department (CD) collected information from a variety of knowledge sources. The participants of the library, SAD and CD indicated several internal and external information sources. Figure 4-2 illustrates the knowledge sources of the departments.



Figure 4-2, knowledge sources of the library, SAD and CD

Knowledge sources contain information from which the library, SAD and CD collect their information and which enabled them to perform their tasks effectively and efficiently. Tacit and explicit knowledge can be gained and collected from or shared with these

knowledge sources. The knowledge sources consist of different knowledge domains., which can be described as relevant topic for the organization. An overview of the knowledge domains are presented in table 4-1. The knowledge domains that were indicated by the library, SAD and CD are:

Table 4-1, Knowledge domains of the library, SAD and CD

	General	Development	Product
Vaccine	Vaccine development	Yellow Fever	Hepatitis A
	Market information regarding products	Influenza Epidemic	Hepatitis B
	Vaccines	Influenza Pandemic	Influenza
		Malaria	Diphtheria
		Tuberculosis	Tetanus
		West Nile	Whooping cough
		Ebola	Meningitis
		HIV	Typhoid fever
		Aids	
		SARS	
		Anthrax	
Antibody	Antibodies	Therapeutic proteins	
		Rabies	
		Factor of coagulation of blood	

	General	Development	Product
Others	Stock volume and prices		
	Amount of investors and stakeholders		
	Investors		

The knowledge domains are divided into three groups, which are vaccines, antibodies and others. These knowledge domains could include general information, information about diseases for which a product is in development and information about diseases for which a product is developed and available on the market. These knowledge domains were indicated by the participants. Other knowledge domains could exist within the organization, but were not identified by the participants or researcher.

4.2.6. KM process

Although figure 4-1 and figure 4-2 illustrates that information and knowledge were shared, it does not imply that knowledge sharing was done in an effective and efficient way. Therefore, all participants indicated that sharing of knowledge was not optimal. The lack of sharing obstructed the departments to perform its task effectively and efficiently. Participant 1 believed that the sharing of knowledge was a top priority and wanted to increase the level of knowledge by stimulating knowledge sharing within the organization, however, participant 1 suspected that the priorities of the organization were different. Also, a lack of understanding regarding other departments and a lack of tools disabled the library to perform its task. According to participant 3, information and knowledge was often not shared outside the R&D department. A local folders structure

obstructed information and knowledge sharing between departments. A lack of knowledge caused problems within the SAD, because they needed the knowledge and information to perform its tasks. They often depend on other departments. According to participant 4, there is a lack of a “sharing” structure. Participant 6 acknowledged that sharing of knowledge could be improved, but due to a lack of time, this is not being done well. A lack of internal and external knowledge caused problems within the CD. They cannot perform their task without the knowledge and information. They are depending on the input of other organizational members and external sources. The KM process “sharing” is chosen for optimization. All problems that are presented in the following section are associated, direct and indirect, with a lack of sharing.

4.2.7. Problems of the Library

The problems that were indicated by the library can be associated, direct and indirect, with the KM process “sharing”. The problems that are discussed are concerned with the current and future goals and strategy, leadership, folder structure, external sources, feedback, willingness to share, island structure, copyright regulations, internal knowledge and gathering of information. The problems are structure according to the segment and elements of the model of Weggeman (1985).

4.2.7.1. Formalization

Goal: Current and future goals

Both participants believed that the current goal of the library was to provide scientific information on and without request. However, the participants did not know exactly the current goals of department, because they had not been defined by the supervisor of the department. According to participant 1, the future goal of the library was to become a

global knowledge centre, whereas participant 2 perceived a lack of future goals within the department. Participant 2 believed that the handling of requests could be outsourced and repeated to infinity. No changes had occurred over the last 4 years within the department. Both participants wanted to have more clarity about the goals of the department. A lack of goals obstructed the library to perform their tasks effectively and efficiently. The goals could act as future perspectives for the participants. Sharing of knowledge and information is often part of the task of the library.

4.2.7.2. *Organization*

Strategy: No strategy

Both participants could describe the current strategy, although it was not defined. Participant 1 explained the process of requesting a document and participant 2 referred to Pubmed. A strategy describes "how" the goals are accomplished (Weggeman, 2000). A lack of a strategy prevented the participants to perform their tasks. Sharing of knowledge and information is often part of the task of the library.

Style of management: Leadership

There was a lack of attention for the library according to both participants. Both participants wanted more attention and more dynamics within the department. According to participant 1, the supervisor lacked time to engage in policy for the library due other activities. According to participant 2 "better leadership is necessary... there should be more attention for the library." Participant 2 believed that the supervisor spent insufficient time on the library, because the current situation was considered to be satisfactory. No meetings were organized between the participants and their supervisor. Participant 2 indicated, "He is our supervisor... I never have a conversation". Both

participants wanted to improve communications with the supervisor. The librarians need more structure and management.

System: Folder structure

The current folder structure is located on a shared driver and is accessible to all organizational members of the Leiden facility. The underlying idea of the folder structure was that it should supported sharing of articles within departments, however, participant 1 suspected that this was not happening and believed that researchers did not have a clue about each others requests. Participant 2 believed that the current structure was based on the ideas of participant 1 and not based on the needs of the customer and is therefore useless. Participant 2 believed that researchers do not share knowledge, because it is their most valuable asset. New knowledge and insights can be gained from articles. The folder structure did not work as it was intended by participant 1. It did not stimulate sharing of articles.

Furthermore, participant 2 had difficulties with finding and adding organizational members within the folder structure. The current folder structure was based on a group folder, which included a personal folder. Participant 2 did not always know in which group or department the organizational members were located. Participant 2 needs to know in which research or project group an employee is located to find or add organizational members. The lack of a proper folder structure and knowledge obstructed participant 2 to perform its task.

System: External sources

Another problem was a lack of external sources. According to participant 1, the company had a limited scope regarding scientific literature. More access to scientific literature was necessary. In addition, there was an overlap of conference information with the CD. According to participant 1, a total policy should be developed to access external sources. A lack of external sources could obstruct decision making processes and the performance of the departments, thus limiting the scope of the organization.

Staff: Feedback

Another problem was a lack of feedback from organizational members. The information flows from the library to the customer, but the library did not receive feedback. The library wanted to know "how" the articles were valued and "what" knowledge was needed by its customers. This knowledge could help the library to provide information more proactive and more precise. The library received insufficient feedback from the SAD and CD. The library could perform their tasks more effectively and efficiently, when receiving feedback.

Culture: Willingness to share

Participant 1 identified a problem concerning willingness to share knowledge. Participant 1 acknowledged that the disadvantage of the current folder structure was that it depended on the organizational members to share information with others. Participant 1 suspected that researchers did not know "who" requested "what" kind of articles, because they did not look in other organizational members folders. Participant 1 believed that there was a culture that supports sharing of knowledge, but that a lack of time inhibits organizational members to share of knowledge. Participant 2 believed that the

researchers would not share knowledge, because ownership provides an advantage in comparison to other researchers.

4.2.7.3. *Realization*

Island structure

Both participants agreed with the existence of an island structure within the organization. The library wanted to know “What is happening at other departments and facilities”. “We are on the side and we do not know what is happening within the company” according to participant 2. Participant 1 said, “It is an island structure. I do not know what CD and SAD are doing. It would be nice to have some insights”. In addition, the library did not have contact with the other facilities. Participant 2 believed that “It is important to arrange centrally. This cannot be efficient.” An island structure can reduce the performance of an organization. Knowledge is often difficult to share, when an island structure exists.

Copyright rules

Copyright regulations were another problem that the library experiences, because it restricted organizational members to share information, in particular scientific articles. The rules state that a document can be shared with one person. Officially, the organization should pay another fee, when a second person requests the same information.

Internal knowledge

According to the participants, the library was lacking internal knowledge. The library did not know “what is happening within the organization”. The library could gain an advantage by collecting and disseminating internal information, because it could increase

the involvement of the library with the organization and improve the performance of the library. A lack of internal knowledge obstructed the library to perform its tasks effectively and efficiently.

Gathering of information

Another problem was the process of gathering information. Information was obtained from the medical library at the University of Leiden. According to participant 1, this was based on informal agreements from the past. Formal agreements can be made between the University of Leiden and the Company. The lack of a formal agreement could affect on the relationship between the Company and the University of Leiden.

4.2.7.4. Conclusion

Both participants acknowledge that the current and future goals of the department were not defined. A lack of contact with the supervisor probably contributed to a lack of goals and strategy in the library. However, goals and a strategy could provide a future perspective for the library. Both participants agreed that more attention and better leadership was required within the library.

Several problems regarding the Company's system were found. The participants had problems with the current folder structure. The reason behind the structure was the priority of sharing and the copyright rules. Participant 1 believed that knowledge sharing is a top-priority, but the copyright regulations restrict knowledge sharing within the organization. Participant 1 hoped that the researchers looked in each folder, but this did not happen. Participant 2 believed that knowledge and information was not shared due to the influence of knowledge and information on the status of the researcher within the departments. Participant 2 believed that the current structure was not based on the need

of the client, but on the ideas of participant 1 and, therefore, was it useless. However, the librarians had little understanding of these problems due to a lack of feedback of the organizational members. The current folder structure obstructs finding and adding organizational members and sharing of scientific articles.

Both participants perceived a lack of knowledge regarding other departments and facilities. The librarians wanted to know “what is happening in the departments” and “how” the information is valued. Participant 1 described the library as an outsider that lacks internal knowledge. The library did not receive feedback from its client, because of a lack of a system. This prevented the library to perform its task effectively and efficiently. Furthermore, more access to external sources was needed to increase the scope of the organization. The participants believed that an island structure existed within the organization. Isolation of the library and a lack of knowledge regarding other departments could be stimulated by a lack of feedback and a lack of a proper system. Within the library, indications were found regarding the weakening of position and a knowledge gap between the library and the R&D department. Furthermore, the organizational dynamics caused a lack of time for sharing knowledge with the organization, which affected the library.

4.2.8. Problems of the Scientific Affairs Department

The problems that were indicated by the participants of the scientific affairs department (SAD) are discussed in this section. The problems can be associated with the KM process “sharing”. The problems of the SAD are related to the current and future goals and strategy, finding, storing and sharing of information, feedback, external information,

willingness to share, island structure and internal knowledge. The problems are arranged by the segments and elements of the model of Weggeman (1985).

4.2.8.1. *Formalization*

Goal: Current and future goals

During the interview, the participants gave approximately the same descriptions regarding the current goals of the department. According to participant 3, the current goal of the department was to secure the scientific reliability and consistency of presentations and communications. According to participant 4, the current goal was to secure the scientific value of presentations and articles. However, both participants acknowledged that the current goal of the department was not defined.

Participant 3 believed that there were no future goals due to the facilitating character of the department. According to participant 4, the future goal of the department was to structure the information of presentations, articles and publications, to allow business development, the CEO, CSO and the R&D department to communicate information in a correct manner to the environment. The current IT structure could be improved by structured, accessible and up-to-date information. Both participants acknowledged that the future goals had not been defined. A lack of goals could affect the performance of the participants, because goals act as guidelines for participants. Confusion regarding the department's tasks could arise, when the goals were not clear defined to the organizational members of the department and other departments.

4.2.8.2. Organization

Strategy: No strategy

The current strategy of participant 3 was to stay close to the results of the study this is an R&D perspective. The current strategy according to participant 4 was to secure the scientific value of presentations and articles. This was from an IT perspective. According to the participants, the strategy was not defined within the SAD. This could be caused by the dynamics of the organization. However, a lack of strategy could lead to confusion within the organization and department.

System: Finding, storing and sharing information

One of the main problems of the scientific affairs department (SAD) was a lack of a proper system to find, store and share information. The current system of the SAD is based on personal folders. The information was stored in local folders, which was not shared with other organizational members outside the department, which obstructed updating of the information.

System: Feedback

Another problem was a lack of feedback from costumers, which obstructed those wishing to find the most up-to-date and correct information. According to the participants, the updating of files depends on emails and employees. According to the participants, files were scattered across different locations, because of a lack of feedback. Other departments, such as the CD and business development, request information from SAD, which could be used to develop "new" articles or "new" presentation. These articles or presentations do not returned to the SAD, which lead to a collection of identical files or

publishing of the incorrect information. Participant 4 believed that a lack of a proper IT system was the cause of a lack of feedback and the scattered files.

System: External information

Participant 4 referred to a lack of knowledge about the outside world. Examples of external information that were given concerned competitors, conference information, World Health Organization, US government, grant organizations, magazines or scientific articles. This lack of external sources limited the scope of the organization, which could influence the performance and decision making processes at the Company. A lack of external information and sources prevented the SAD to perform its tasks effectively and efficiently. Sharing of knowledge and information could be crucial for the SAD to perform its task.

Culture: Willingness to share

The information requested by researchers was not shared among the researchers according to participant 3. Participant 3 believed that: "There is no need" to share the requested information within the project and research groups. There was no obligation to share information, but information was shared, when it was needed. A lack of willingness to share information could affect the performance, decision making process and organization dynamics within the company.

4.2.8.3. Realization

Island structure

Participant 3 agreed that the department was an island structure. There was a lack of knowledge regarding the R&D department within the organization. Some information is confidential and cannot be made public whereas other information can be shared.

Participant 3 said, "It is hard to assess other department, because I do not know the other department that well." This could also indicate that a island structure exists within the Company. The behaviour of the organizational member could stimulate the island structure, a lack of time or the knowledge gap could stimulate the behaviour. Participant 3 acknowledged also a lack of contact with other facilities. The island structure prevented knowledge sharing within the organization and obstructed the SAD to perform its task effectively and efficiently.

Internal knowledge

According to participant 3, knowledge within the R&D department could be shared better. Participant 3 believed that there was a lack of knowledge in the company about "What is happening within the R&D department". Internally, within the R&D department, this knowledge regarding programs, status of the program and problem was shared via regular meetings and presentations. A lack of internal knowledge could prevented the SAD to perform its task effectively and efficiently.

Internal knowledge was also lacking within the SAD, such as market knowledge from the marketing and sales (M&S) department. Valuable knowledge about the current products was available within the M&S department, however, the R&D department did not obtain or receive this information. Therefore, participant 4 wanted to become a knowledge broker between these departments to provide internal knowledge. Media clippings from the CD and product information were also lacking within the SAD. The information should be accessible anytime, which did not happened. This lack of information could affected the Company's performance, decision making processes and lost of business opportunities.

4.2.8.4. Conclusion

Both participants acknowledged that there was a lack of goals and strategy regarding future goals. This lack of goals could influence the performance of the department or organization.

One of the main problems of the scientific affairs department (SAD) was a lack of a proper system to find, store and share information. The system was based on local personal folders, which were not shared with other departments. The result of the folder structure was that similar files were located at different locations. No feedback was provided by the customers, which often prevented the updating of files. A lack of a proper knowledge distribution structure also contributes to a lack of internal and external knowledge and caused an island structure. Information and knowledge was locally stored not shared and was not accessible by other departments. Participant 3 agreed that there was an island structure within the company and believed that there was a lack of knowledge in the company about "what is happening within the R&D department". Therefore, participant 4 wanted to become a knowledge broker. A lack of a system, feedback, and lack of internal information contributed to the island structure within the company and a lack of knowledge sharing. Within the SAD, a lack of time obstructed the organizational members to incorporate knowledge sharing in their daily tasks, which could be caused by the dynamics of the organization. Sharing of knowledge was not seen as a priority. Furthermore, indications were found within the SAD regarding a knowledge gap and weakening of positions.

4.2.9. Problems of the Communications Department

The problems that were indicated by the communications department (CD) concerned the current and future goals and strategy, change of management, folder structure, external sources, on-time information, capacity and time, adhocracy, island structure, internal knowledge, confidentiality and copyright regulations. The problems can be associated with the KM process "sharing". The segments and elements of the model of Weggeman (1985) are used to structure the problems.

4.2.9.1. Formalization

Goal: Current and future goals

All the participants of the CD had different opinion regarding the current goal of the department. Participant 5 indicated that the current goal of the department was to disseminate information on-time as required throughout the company and externally. Participant 6 believed that the current goal was "To providing stakeholders of the organization with proper information". According to participant 7, the current goal was to create a positive attitude in the stakeholders and to be known to the outside world. Participant 7 had a different view then participant 5 and 6, which was caused by the task of participant 7. All participants acknowledged that the current goals of the department were not well defined.

All participants agreed that the future goal was to structure the department. Participant 6 also believed that the future goals are similar to the current goals, however, the future goals become more nuanced. Participant 7 believed that there was a lack of future goals. According to participant 7, long-term goals cannot be establish, because of a lack of

time. The lack of time could be caused by the organizational dynamics. This lack of goals could influence the performance of the department and organization.

4.2.9.2. *Organization*

Strategy: No strategy

Participants 5 and 6 acknowledged that there was no strategy defined. Participant 5 described the strategy as processes and participant 6 referred to strategic goals. At the time of the research, participant 6 was developing strategic goals for the department. These goals are an internal communication structure, the creation of culture awareness and increasing knowledge about the Company. According to participant 7, the current strategy was to share correct information and increase of the visibility of the organization. The strategy of the CD was not specified, which could have effect on the performance of the CD.

Style of management: Change of management

According to participant 6, continual change in management within the department was a problem for the CD. The distance between higher management and the CD has become too large. Little information was received from higher management. The managers were often too busy or they work at different locations. According to participant 6, contacts were difficult to establish due to changes of management and department. At the time of the research, participant 6 acted as the intermediate between the CD and higher management. The change in management created a knowledge gap. A lack of time obstructed knowledge sharing.

System: Folder structure

One of the problems regarding the system was the storage of information. Information was stored locally in a personal folders structure. The folders structure was accessible by the employees of the CD, but not by other departments. Information and knowledge was shared within the CD, but not outside the department. The folder structure also caused problems with updating files. The result of the local structure is that similar files were scattered across different places, which made updating of information difficult. More knowledge could be gain by improving the folder structure, according to participant 5.

System: External sources

Other problems discussed during the interview were related to external sources. The CD has a lack of knowledge about online media. The participants utilizes an online database, Lexis Nexis, to search for media clippings, however, this database contains only printed media. Online information was not captured by the online database, such as knowledge regarding competitors and newswires. This limited the scope of the CD and could have an influence on the performance and decision making processes of the department and the Company. The CD could not perform its task effectively and efficiently.

Staff: On-time information

All participants indicated that receiving on-time information was a problem. The CD depends on the input of other departments. The CD cannot perform its task effectively and efficient, without the on-time information. The result of this situation was that the CD had difficulties with finding knowledge and information and had to work ah hoc. This lack of on-time information was often caused by the dynamics of the organization, but influence the performance of the department. Their could be uncertainly about the value

of knowledge and a lack of motivation to share knowledge by the organizational members.

Staff: Capacity and time

A second problem regarding the staff of the CD is a lack of time and capacity within the department, which made it difficult to structure their working processes. Participant 5 believed that "There needs to be more structure in the department and this has always been a challenge. It seems always to be understaffed." Participant 6 agreed on a lack of capacity and lack of time. Participant 6 would like employees to be more curious and willing to investigate, however, a lack of time and capacity prevented this. A lack of time prevented the CD to perform its task effectively and efficiently.

Culture: Adhocracy

One of the cultural issues that was identified by the participants of the CD was the adhocracy within the department. According to participant 5, "We have very tight deadlines usually. They are not flexible. We have to meet the deadline, no matter what". Participant 6 believed that the adhocracy was a disadvantage, because it obstructed proper preparation. Participant 7 said, "The problem of an ad hoc working style is that there is not a plan. It prevents long-term thinking". The adhocracy could be caused by a lack of time, a lack of capacity and organizational dynamics.

4.2.9.3. Realization

Island structure

Another problem was the island structure within the company and department. Participants 5 and 6 acknowledged that there was an island structure within the Company and the department. Participant 5 believed that everybody has their own

database and acknowledged that the CD contributes to the island structure as well. Participant 5 was told by management not to bother with it, because other priorities were more important. Participant 6 said, "Nobody has access...it is local, which does not fit the Company as a international company with employees who need communications". The CD has no contact with the library. The CD does not see the similarities between them and the library, but the participants do have contact with the scientific affairs department (SAD). They acknowledged that the SAD was a value source of information. The island structure obstructed proper knowledge sharing within the organization and could be caused by the dynamics of the organization.

Internal information

Another problem was a lack of internal information. There was no proper structure in-place to capture internal knowledge. Sometimes, the participants do not know where to find the proper information or appropriate people. According to participant 6, more information was needed to perform their tasks. According to participant 7, some information was critical. In addition, the CD could not meet the need other facilities. Information about products is lacking, which has an effect on the performance of the department. The CD cannot perform its task effectively and efficiently. There was a knowledge gap between the CD and its internal stakeholders.

Confidentiality

Another problem was the difficulty of disseminating and sharing knowledge, because of the confidentiality of the information. If such information is made public, internally or externally, then the organization is obliged by stock exchange regulations to share the internal information also with the external environment. The information could have affected

on the stock prices of the Company. Therefore, some information was shared with a limited group of organizational members.

Copyright rules

Sharing of articles was another problem. The CD would like to share articles, but are restricted by copyright regulations. The CD used a Dutch PR company to paraphrase articles to make sharing of articles within the organization possible. The disadvantage was that it was expensive and only covers the Dutch media. The copyright regulations often restricted the number of organizational members. The information cannot be shared, unless additional licensees' fees are paid.

4.2.9.4. Conclusion

The participants of the communications department (CD) have different opinions regarding the goals and the strategy of the department. The differences between participant 7 and the other participants were caused by the different task and function of participant 7. However, all the participants agreed that the current and future goal and the strategy of the department are not defined. A lack of goals and strategy could lead to less structure within the departments and could have influenced the performance of the organization. The changes in management created a knowledge gap and often caused adhocism within the department. The lack of structure affects the performance of the department and sharing of knowledge. No proper system is in-place to find, store and share information. Information was stored locally in a folder structure, which was not shared with other departments. Therefore, files were scattered across different locations, which made updating of information difficult. In addition, dissemination of information was difficult due to confidentiality, stock exchange regulations, and copyright regulations.

A PR company was used to paraphrase the Dutch articles, however, this was expensive. The lack of sharing could affect the effectiveness and efficiency of CD.

A lack of on-time information caused adhocacy within the department. On-time information could improve the preparation and could decrease the adhocacy. On-time information could increase the performance of the CD. The participants also had difficulty to obtain knowledge, because they did not know where to find the knowledge or appropriate people to ask for help. The department lacked internal information, which resulted in insufficient preparation and adhocacy.

Furthermore, there was a lack of external information. The CD had a lack of knowledge regarding online knowledge, such as competitors and newswires. The participants use Lexis Nexis to gather external knowledge, however, it contains only printed media. A lack of external information could influence the decision making processes and the performance of the CD and organization.

A lack of time, capacity, internal information, on-time information and changes in the department and management had caused adhocacy within the department. A proper structure cannot be realized and had stimulated the island structure within the department. As a result, sharing of knowledge has become difficult, which obstructed the CD to perform its tasks effectively and efficiently. The problems were often caused by the organizational dynamics. A lack of time prevented the CD to perform its task effectively and efficiently. Organizational members had other priorities. They could not incorporate knowledge sharing within their daily activities, because of a lack of time and capacity. Indications were also found regarding uncertainty about the value of knowledge, a knowledge gap, a lack of management support within the CD.

4.3. Summary

An in-depth description of the current KM practices and culture of the Company and the departments, library, scientific affairs department (SAD) and communications department (CD) were given in this chapter. In addition, a more in-depth description of the tasks of the departments was given. The KM process “sharing” was chosen by the participants for optimization. The problems that were indicated by the participants can be associated, direct and indirect, with the KM process “sharing”. Table 4-2 provides an overview of the problems of the three departments.

Table 4-2, Overview of problems of the three departments

Department Segment	Library	Scientific Affairs Department	Communications Department
Formalization	No goals defined	No goals defined	No goals defined
Organization	<ul style="list-style-type: none"> No strategy defined No contact with supervisor No sharing folder structure Lack of external sources No feedback of organizational members Willingness to share 	<ul style="list-style-type: none"> No strategy defined Lack of finding, storing and sharing of knowledge/information Lack of external information No feedback of knowledge/information Willingness to share 	<ul style="list-style-type: none"> No strategy defined Changes in supervisors No shared folder structure Lack of external sources Lack of on-time information Lack of capacity and time Adhocracy
Realization	<ul style="list-style-type: none"> Island structure of departments Lack of internal knowledge Copyright regulations Informal gathering of information 	<ul style="list-style-type: none"> Island structure of departments Lack of internal knowledge 	<ul style="list-style-type: none"> Island structure of departments Lack of internal information Copyright regulations Confidentiality

As shown in table 4-2, the departments often experience similar problems. These problems can have an effect on the performance of the departments and organization, on the tasks of the departments, departmental decision making processes and sharing processes. The SAD obtained a more IT perspective whereas the library and the CD had a combination of HR and IT perspective. The problems are often caused by a lack of time, a lack of management support, the inability to incorporate knowledge sharing within the

daily task, a knowledge gap between sender and receiver and uncertainty regarding the value of knowledge. These elements, identified by KPMG (2000) and Weggeman (2000), causes a lack of knowledge sharing.

All participants acknowledged that the current and future goals and strategy of the departments were not defined by the supervisor of the department, however, a description of the goals and strategy could be given by the participants. A lack of goals and a strategy influenced the performance of the departments and organization. Defining goals and strategies could had provide future perspective, structure and clarity to other departments. Currently, participant 6 is setting future goals for the CD, in response to a lack of, and changes in, leadership.

According to the participants, a proper IT system was lacking within the library, SAD and CD to share, find, store and update information. Knowledge could be gained from this information. The SAD and the CD experience the problem of scattered information across different personal folders. No feedback regarding documents and presentations were given by the customers, which led to similar files stored at different locations and difficulty with updating and finding the up-to-date information.

The library was lacking feedback and internal knowledge. The library wanted to know "how the provide information is valued". At the moment, the library acts as a single entity, but wanted to get more involved with the Company as a whole. The library needs a IT system to share articles and information within the Company. The folder structure of the library was often insufficient. The folder structure was developed to enable organizational members to share scientific articles, however, the information was not shared. The library expects the customer to search in the folder structure, however, this

is not happening. The folder structure does not perform as expected. Furthermore, one of the problems with sharing articles with the organization is the restrictions due to copyright regulations experienced by the library and the CD. The CD solved this issue by making use of a Dutch PR company to paraphrase Dutch articles. This allowed the CD to share articles with multiple organizational members, however, it did not solve the problem of international articles.

Another problem of all the departments was a lack of external sources. The departments supposed to be lacking online information and knowledge regarding, for example, governmental, non-governmental commercial and non-profit organizations, which limited the scope of the organization and influence the decision-making process of the departments and the Company. The tasks of the departments could be more effectively and efficiently, when such information was available.

Another similarity was the issue "willingness to share". Participant 1 believed that sharing information was a top priority and wanted to stimulate knowledge sharing via the folder structure. Participant 1 believes the articles are not shared among the researchers. Participant 2 believed that the articles will not be shared via the folder structure, because of the influence of knowledge 'hoarding' on the status of the researcher. Participant 3 acknowledged that articles are not shared within the R&D department, which made the current folder structure obsolete. A lack of feedback and internal knowledge made it difficult to obtain such information.

All participants indicated a lack of knowledge concerning the organization. The library wanted to know "What is happening within the company" and wanted to get involved with the organization. The CD had difficulty finding the concrete information and

appropriate people. A lack of internal knowledge often affected the performance of the departments. The departments cannot perform it task effectively and efficiently without the internal knowledge, because they depend on other departments input. The SAD wanted to become a knowledge broker and, therefore, needed more access to the internal knowledge. All participants agreed on the existence of an island structure within the Company. The island structure obstructed the process of knowledge sharing within the Company.

Furthermore, user requirements for an IT system were given during the interviews. The requirements should be taken into account when designing KM practices for the Company. These are summarized in table 4-3.

Table 4-3, User requirements for IT system

User requirements	Description
Single platform	Single storage place for documents
Authorization	Members of the organization should have permission to access information
Notification	Members of the organization should be notified regarding topics of interest
Qualification	Information should be structured
Speed	The KM practices should be able to find the proper information within a certain period
Easy to use	The handling of the KM practices should not be complicated
Easy to access	The interface between the participant and the KM practices should not be complicated

User requirements	Description
Feedback	Updated information should be accessible by all authorized members
Multiple entrances	Information should be accessible in different ways
Labeling/ Tagging	Information regarding the information should be attached to the information
Sharing of confidential information	The Knowledge Management practices should be able to share confidential information
Sharing of general information	The Knowledge Management practices should be able to share general information

5. Knowledge Management Solutions

The solutions for the problems of the three departments are presented in this chapter. Different knowledge management tools, e.g. KM tools, can be used to increase the performance of the departments. An overview of the KM solutions and the problems of the departments is given. The following section elaborates the KM solutions for the specific problems of the departments, library, scientific affairs department (SAD) and the communications department (CD). Additional KM solutions are also considered for the whole organization, because not all KM solutions can be applied within the organization due to the specific problems of the departments, but are important for the long-term view of the organization.

5.1. Explanation of Knowledge Management Solutions

This section provides a link between the problems of the departments and the KM solutions. The link between the problems and KM solutions is presented in table 5-1. The problems are arranged according to the similarities among the departments and the specific problems of the departments.

Table 5-1, Overview of the problems of the departments and KM solutions

Dep.	Problem	Solution
All	No goals defined	defining goals
	No strategy defined	defining strategy

Dep.	Problem	Solution
All	A lack of feedback	Document management system (DMS) and collaboration tool
	A lack of internal information	RSS feeds
	A lack of external information	RSS feeds
	An island structure within the organization	Collaboration tool
	Copyright rules	Additional staff
	Lack of finding, storing and sharing of knowledge/information	DMS, collaboration tool, database
Library	No sharing folder structure	RSS feeds and DMS
	No contact with supervisor	Meetings
	Willingness to share	Rewards and collaboration tool
	No proper gathering of information	Investments
SAD	Willingness to share	Rewards and collaboration tool
CD	Confidentiality of information	DMS
	A lack of on-time information	Collaboration tool
	A lack of capacity and time	Collaboration tool
	Changes in supervisors	Meetings
	Adhocracy	Collaboration tool

Legend: Dep. = department, SAD = Scientific affairs department, CD = communications department

The following sections are structured according to the KM solutions, because multiple problems can be solved with a single KM solution. Some KM solutions incorporate several KM tools and KM technologies.

5.1.1. Defining goals and strategy

All departments perceived a lack of goals and a strategy, which influence the performance of the departments and organization. Therefore, goals and strategies should be defined. This is beneficial for the library and CD, because it often contributes to a future perspective and structure of the departments. Furthermore, the Company has to change from an adhocracy culture into a more hierarchical culture, which includes more formalization (Jansen, 2006). The formalization of goals and strategies could be a start and contributes to the structure within the departments and organization.

5.1.2. Document Management System

A lack of a proper system restricted the participants to share, find, store and retrieve explicit knowledge and information. According to Coleman (2001), providing tools stimulates knowledge sharing. The DMS allows information sharing from which knowledge can be gained. Within the Company, not all knowledge and information can be shared with all organizational members due to the confidentiality. Therefore, the system should be able to deal with general and confidential information. General information can be shared and made visible to all members of the organization whereas confidential information can only be shared with a limited group of members. The system should also be able to share information on different levels. The levels of sharing are: individual, group and organizational level. An individual or group could share information with other

individuals, groups or with the organization. A document management systems (DMS) can be used to perform these tasks. A DMS is often used to control, monitor and organize information. According to Raynes (2002), a DMS includes:

- Controls the modification of a document at a time
- Audit trail to monitor changes overtime
- Secures the accessibility of users to document
- Organization of documents in groups and folders
- Identification and retrieval of the document via text-based search
- Records information regarding the author, date and title (meta data)
- Ability to control information flows between users

A DMS can transfer information between individuals, groups and organization. Explicit knowledge can be obtained from the information within the DMS. Organizational members can externalize, combine and internalize explicit knowledge (Nonaka, 1995). A DMS contributes to the externalization, combination and internalization knowledge. A DMS suites the scientific affairs department (SAD) and the communications department (CD), because it controls information flows. The user requirements are taken into account. The DMS qualifies, authorized and provides feedback. The DMS allows the user to categorize the information into different levels. Authorization prevents publishing of confidential information to unauthorized employees.

5.1.2.1. Portal

The information was stored in the local databases. The DMS should be able to share, find, store and retrieve knowledge and information from these local databases and, therefore, a portal is introduced. Figure 5-1 illustrated the current and future situation.

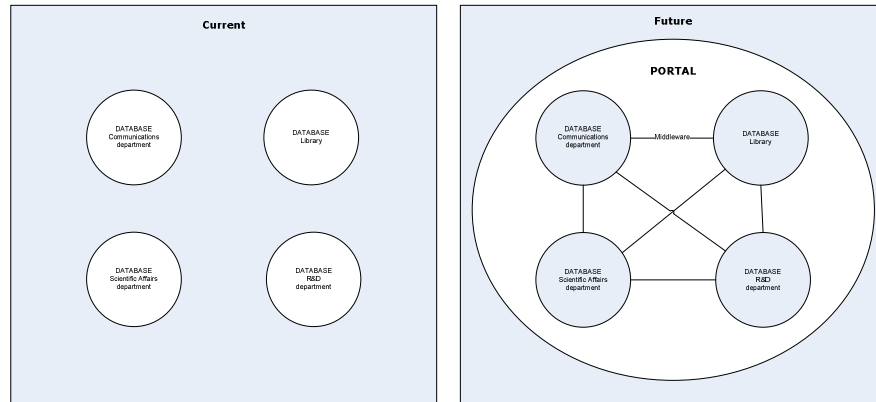


Figure 5-1, Overview of current and future situation

As shown in figure 5-1, the portal act as a single platform, but the information is still stored within the multiple databases of different departments. Middleware should be used to connect the databases and create the portal. The portal allows the organizational members to search, find and retrieves knowledge and information from other departments' databases. It is an extra layer that connects the separate databases with another. The current folders structure can be maintained within the portal, which simplifies the use and access of information.

5.1.2.2. *Meta search engine and Metadata*

A meta-search engine should used to find the appropriate information within the databases. The meta-search engine makes use of metadata, e.g. tagging or labelling, which is often used to classify the information. Metadata can be inserted manually, via pre-define lists and automatically. An organizational member can inserted manually specific keyword in open tagfield. This allows the organizational member to add keywords to a piece of information. Pre-define lists allows the organizational member to select certain keywords from a list. The organizational members can be forced to enter or select

keywords or it can be optional. Automatic metadata is generated by the system itself. Examples of PC based metadata are author, time and data of storing a document.

Type of label

The knowledge domains can be used as metadata. The diseases are the collective topic of the organization. The tagfields allows the users to structure the information. The list should be flexible, because organizational members should be able to attach more topics to one document. Another flexible tagfield that should be incorporated is the "technology", because it is involved in projects, licensing, a press release or scientific article. Exceptions can be indicated as "None". Furthermore, a fixed list of organizational features should be presented to it supports the classification of the information. The list should include the general terms as: R&D, Corporate, Marketing & Sales, Financial and Communication. R&D information can be divided into "vaccines" and "antibodies". PC-based metadata should also be assigned. Examples of PC-based metadata are: author, date of creation, date last saved, title, subject, organization and type of file (e.g. doc, xls, ppt, eml, pdf). PowerPoint presentation needs additional metadata. The extra metadata that should be incorporated are: the presenter, place, date and time of the presentation. All types of metadata contribute to improving the search for information within the portal. A "virtual structure" can be created by using metadata within the portal. The information can be visualized by the meta-search engine. The meta-search engine allows the user to access information easily and to search by multiple topics.

Advantage and disadvantage of metadata

Every type of inserting metadata has it advantages and disadvantages. Wrong or a lack of labels could be applied, when an organizational member enters metadata manually. Different perspectives could prevent finding correct information. A disadvantage of flexible lists supposed to be that an organizational member could not add metadata to

the information on which the system depends. Inappropriate labels or insufficient labels can be attached to the information, when organizational members select predefined metadata. The metadata does not cover the whole subject. The disadvantage of automatic metadata is that the keyword should be in the document. For example, there is a difference between the tags "knowledge management" and "KM", but they have identical meanings. Therefore, a combination of the labels is preferred. Here, an additional task is reserved for the library. They can maintain the metadata of the documents.

5.1.2.3. Audit trail

An audit trail is often used to trace the information. When a user updates information, the DMS controls the information and the updating of the document. This allows the members of the organization to find the most up-to-date information. Modifications of the information will be monitored by the DMS. The information can be visualized when a search is executed by a authorized user.

5.1.2.4. Internal RSS feed

A kind of notification and visualization is needed to share general and confidential information. End users should be aware of new information within the document management system (DMS). An organizational member could share information with the DMS, but it does not mean that other participants find and use the knowledge or information. RSS feeds can be used to inform the participants. The end user could personalize information given a certain topic or information can be pushed by the sender. RSS feeds are used, because of the dynamics of the organization and the lack of time. The benefit of RSS feeds is that allow a user to personalize the information flow and reduce the information overflow. The organizational member should indicate if the

information is general or confidential and able to select organisational members. Internal RSS feeds can inform the library about a lack of metadata and researcher regarding requested articles. The customer should be able to determine and change the topics, because interests could change.

5.1.2.5. Training

Training should be provided regarding the use of the DMS. This increases the understanding and explains the benefits of the DMS to the organizational members. Therefore, training increases knowledge sharing (KPMG, 2000).

5.1.2.6. Operating the Document Management System

Organizational members should operate the DMS. The DMS is not working without interaction of the organizational members. The organizational members should interact with the DMS. General and confidential information could be shared with the DMS by the participants.

General information

General information is, mainly, generated by the library and CD and can be collected from internal or external sources. Figure 5-2 illustrates the flowchart of the general information. The flowchart describes the information flow between two participants, a group or organization.

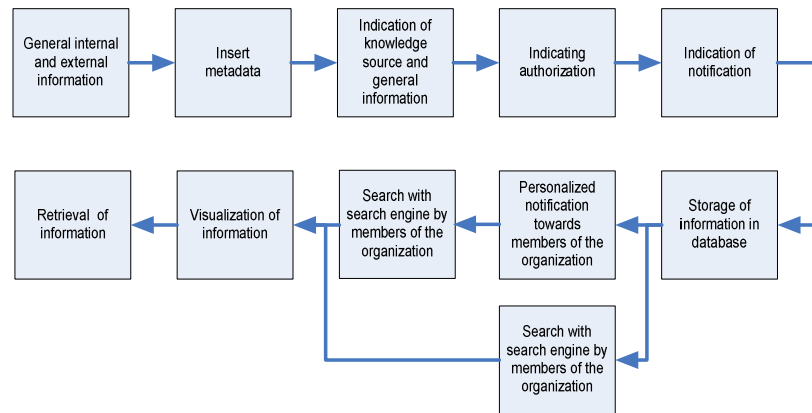


Figure 5-2, flowchart of general information

Before the general information can be stored within the databases, metadata should be assigned by the participants. Then, the organizational member should classify the knowledge source. The classification could be internal or external and general or confidential. An indication of the level of authorization should be assigned. In this case, the information is general and can be shared with the whole organization. Other levels that could be indicated are: individual level or group level. The information could have a priority or not, because it could be critical for the organization, a group or an individual. Therefore, the sender should be able to push the information to the organizational members or not. A notification is sent, when the information is stored within the database. The sender could also store the information without notifying the organizational members. Then, the organizational member can pull the information from the database by utilizing the meta-search engine.

Confidential information

Confidential information cannot be shared within the organization, but only with an individual or group. Confidential information is generated and shared within library, SAD

and CD. Figure 5-3 illustrates the flowchart of the confidential information. The flowchart describes the information flow between two participants or a group.

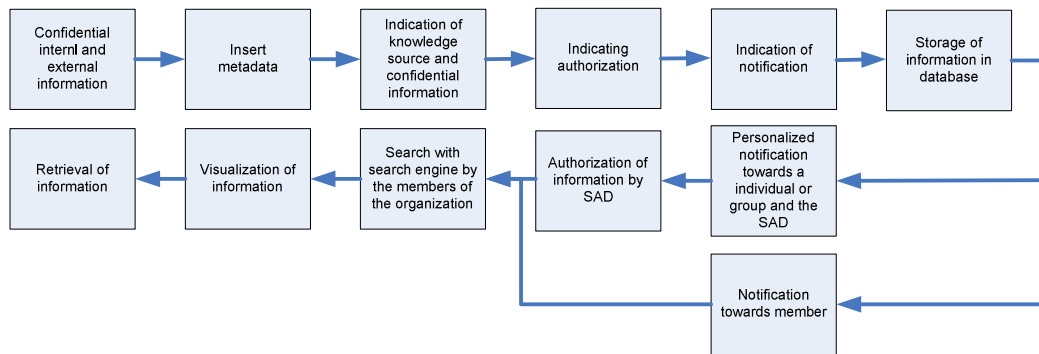


Figure 5-3, Flowchart of confidential information

Before the confidential information is stored, metadata should be assigned by the participants. The metadata influence the authorization and notification. Confidential information could consist of information that is critical to the organization and could influence the value of the stocks. An example is a press release, which should be prepared in advanced, however, the information is classified. The information should be checked by the SAD to prevent publishing of incorrect information, because of the knowledge gap between CD, SAD and researchers. Another type of confidential information is a scientific article, because it cannot be shared with multiple organizational members due to copyright regulations. This kind of information should not be controlled by the SAD. Then, an indication of the knowledge source and the type of information should be given. In this case, the information is confidential. Organizational members should be authorized to find, access and retrieve the confidential information. Therefore, authorization should be indicated by the user. Eventually, the kind of notification should be indicated by the organizational member. The notification can be pushed, when it is critical or pulled from the database, when it is less important. After storing the

information in the database, a notification is sent to the authorized organizational members. The organizational members should be aware that information should be checked by the SAD or not. Other organizational members can access and collect the information from the database, when the SAD has verified and labeled the information as general information. The SAD could also verify the information without changing the confidential information into general information. Therefore, the SAD should be able to determine whether the information can be shared with an individual and group. The SAD should be able to indicate on which level, individual level, group level and organizational level, the information can be shared.

As noticed, the classification, authorization, notification of the information depends on the organizational members. Therefore, single IT system is often not sufficient. Other KM tools should be used to stimulate organizational members to share the information and to allow the SAD to perform its task. The advantage and disadvantage of the system is that the information is verified. The system reduces the dynamics of the organization, but increases the quality of the information. The SAD functions as a knowledge broker. The organizational member should also be aware that the information should be verified with the SAD, which can be an advantage and disadvantage.

5.1.3. Folder structure

A lack of knowledge sharing within the department can be overcome, till a certain level, by rewarding the organizational members on knowledge sharing. However, some knowledge that is possessed by the researcher is often not shared due to the internal competition, a lack of time, weakening of position of the researcher and uncertainty about the value of knowledge (KMPG, 2000 and Weggeman, 2000). Researchers gain

status within the field of expertise by writing articles. Other articles are needed to write the “new” article. Therefore, scientific articles are often not shared within the R&D department, which makes the current folder structure obsolete. The folder structure should change from a group folder with a personal folder into only a personal folder, which makes finding and adding members of the organization less complex. The articles are stored within the folder structure, which is part of the portal. The researcher, who requested the article, is able to find and access the articles via the meta-search engine. Other researchers should not be able to find, access and retrieve the scientific articles due to the copyright regulations. Internal personalized notifications, e.g. RSS feeds, can inform the researcher about the requested article. The articles can be requested via mail, paper or verbal communication at the library.

5.1.4. Collaboration tool

A collaboration tool, such as Lotus Notes, is used to overcome the problem of the island structure, lack of internal information and lack of feedback. Assumed is that the island structure exists due to a lack of a proper system to communicate, a lack of time and the dynamics of the organization. The collaboration tool can provide on-time information, overcomes the barrier of finding the appropriate persons and diminishes the adhococracy of the communications department (CD). The library could get more involve with the organization by utilizing the collaboration tool and the scientific affairs department (SAD) could use the collaboration tool for controlling unstructured information between the marketing and sales department and the R&D department. According to Coleman (2001), providing collaboration tools stimulate knowledge sharing. The collaboration tool can be used to transfer explicit knowledge and less structured information. Organizational members can externalize, combine and internalize explicit knowledge (Nonaka, 1995). A

collaboration tool can execute this task. Social networks between organizational members can be stimulated by using a collaboration tool.

5.1.4.1. Discussion forum

A discussion forum should be part of a collaboration tool and can be used to communicate, find and store knowledge and information and organizational members. The discussion forum is a mean to stimulate communicate among organizational members. The discussion forum allows the CD to see “who” is responsible or had interacted with a particular subject or discussion, which could simplify the task. The CD is also able to participate or post new discussions.

Organizational members can also provide feedback via the discussion forum, which increases the benefits of knowledge sharing (Coleman, 1999). The library needed feedback from their clients. A lack of feedback led to a lack of understanding and isolation of the library and a lack of internal knowledge. Special interest groups or discussion groups can be established within the discussion forum of the collaboration tool, which supports knowledge sharing (Cabrera, 2002). The library and CD can interact with the organizational members via the discussion forum. The discussion forum stimulates social network within the organization (Cabrera, 2002). The library can be more involved with the organization and is able to provided information upfront by identifying the subjects of the special interest groups or discussion and involving in discussion themselves. Participants of the library could be more proactive. The supervisor of the library should provided time and space to interact in the discussions.

The discussion forum can also be used to share ideas and market information between the R&D department and M&S department. The SAD can act as a knowledge broker

between the two departments and control the information. New opportunities could be shared with another. The discussion forum can be used to transfer the explicit knowledge. The benefit of a discussion forum is that it enables organizational members to store, access and retrieve information at a different time and connects different departments. The disadvantage is a surplus of information. The SAD can avoid an overflow of information.

5.1.4.2. Training

Training regarding the collaboration tool should be provided. Training increases the understanding of the use and benefits of the collaboration tool (KPMG, 2000 and Cabrera, 2002) to the organizational members and the efficacy of the collaboration tool. Training increases the knowledge sharing via the collaboration tool.

5.1.5. External RSS feed

All departments perceive a lack of external information. External RSS feeds can be used to monitor and collect online information regarding governments, non-governmental organizations, commercial organizations and non-profit organizations. RSS feeds often contain information regarding updated information and websites, which can be visualized by a RSS aggregator. An organizational member can look within the RSS aggregator instead of visiting websites every day and search for new information. The organizational member can save valuable time by using RSS feeds. Furthermore, information can be personalized and an information overflow can be prevented. This is beneficial for the dynamics of the organization.

5.1.6. Reward

Appraisals and rewards stimulate knowledge sharing within the organization (Cabrera, 2002). They can be used to increase the success of the DMS and collaboration tool. The Company uses stock options to reward the performance of organizational members. However, knowledge sharing is not incorporated within this evaluation process. Rewarding knowledge sharing should be incorporated in the evaluation process. The type of reward could be social recognition or monetary, because it reduces the individual cost of sharing knowledge. The organizational member has to interact with the systems. The purposed systems are useless without stimulating organizational members to share knowledge and information. Rewards and appraisals diminish the individual cost of knowledge sharing (Cabrera, 2002). The effort of contributing knowledge to the organization should be valued.

5.1.7. Additional staff

The library and communications department (CD) perceived a problem regarding copyright regulations. The copyright rules obstructed the process of sharing articles within the organization. The CD utilized a Dutch PR organization to rewrite Dutch articles. The disadvantage of the Dutch PR company was that it translated only Dutch media and was expensive. Therefore, additional staff is recommended to translate media clippings, which allows sharing of media clippings within the organization. Furthermore, the CD perceived a lack of capacity within the department and, therefore, additional staff is also recommended. The additional staff could perform several tasks. More time becomes available for the other organizational members of the CD to perform its task effectively and efficiently, which reduces the adhocracy within the CD. The library collects scientific articles, which are international and, therefore, can not use the Dutch PR company.

Researchers need the articles within a certain time frame to perform their tasks and stay innovative. Therefore, additional staff is needed to translate the scientific articles to increase knowledge sharing.

5.1.8. Investment

Other investments are necessary, beside the investment in the recommended tools. The library indicated that the gathering of articles from the medical library of the University of Leiden was based on an informal agreement. This could have effect the relationship between the Company and the University of Leiden. According to the Company's librarians, there is an unspoken agreement between the Company and the University of Leiden, however, more clarity regarding the gathering of articles is needed. Therefore, investments are needed to formalize the agreement.

5.1.9. Meeting

Although the Company is a dynamic organization and meetings are not often scheduled, it is wishful to organize regular face-to-face meetings. Tacit knowledge can be transferred between participants, researchers, supervisors and other organizational members during the meetings. Nonaka (1994) refers to the process of socialization. The participants of the library need meetings to get more involved with the organization and to improve the communication with their supervisor. A meeting enables the CD to obtain information and knowledge from the higher management or other organizational members. The meetings can be scheduled one's a week. The customers of the CD should be able to bridge the knowledge gap and the CD should indicate that the information is valuable. Feedback regarding the use of knowledge and information should be given.

5.1.10. Change of behavior

Awareness regarding knowledge sharing should be created within the departments. The library is aware of the importance of knowledge sharing whereas the SAD and CD experience problems with knowledge sharing. The importance of knowledge sharing can be enhanced within the SAD and CD. The lack of time, management support and capacity obstructs the SAD and CD to incorporate knowledge sharing in their daily activities. KM tools are introduced to overcome the specific problems of the library, SAD and CD. These tools support explicit and tacit knowledge and information sharing. Personalized KM tools were recommended due to the dynamics of the organization and organizational culture. Organizational members should accept that the problems cannot be solved by introducing IT systems. Organizational members should be stimulated and willing to interact with the systems and contribute and share knowledge and information. Additional tasks are assigned to the library and SAD to receive feedback and correct knowledge and information. The behaviour of the library should be more active. Therefore, more time and space should be provided by the supervisor of the department. The SAD becomes a knowledge broker. Therefore, SAD should control and maintain the systems to receive the correct knowledge and information. The library should assist the SAD. Furthermore, the behaviour of other departments towards the SAD should change. Organizational members should be aware that the SAD should verify information, which is going to be externalized.

5.2. Overall solutions for the organization

The following sections contain additional KM tools. The section is included, because the Company wants to implement KM companywide. To implement KM companywide, other

KM practices should also be considered by the Company. The previous KM tools were developed for the specific problems of the library, the scientific affairs department (SAD) and the communications department (CD). The following KM tools are less relevant for the case study, but could be vital for the implementation and success of KM companywide. This section supports the long-term view of the Company.

5.2.1. Knowledge Management Strategy

At the point of research, higher management of the Company did not define a KM strategy. A KM strategy can act as a guideline. It describes “how” a goal can be accomplished. Therefore, defining a KM strategy is recommended. The KM strategy should also fit the other facilities. According to the mission statement, goals, business strategy and organizational aspects of the Company, the Company should more focus on a personalization knowledge management strategy, e.g. KM strategy instead of a codification strategy (Hansen, 1999). the Company wants to stay creative, innovate and differentiate with their products and technology and being the first in the market. However, the Company moved from a R&D based company to a production based company, which asked for another approach within the firm. Previously, the Company did not produce a biotech product. Nowadays, the Company has to comply with the Food and Drugs Association (FDA) regulations and, therefore, are constrained by more regulations and rules regarding the safety of a product. This includes, for example, that all steps within the process of development should be documented and stored. Jansen (2006) recommended a cultural change. The culture should change from an adhocracy culture to a more hierarchical culture, which also could introduce more formalization and standardization of working processes. The change in type of organization and culture indicates a shift from a personalization strategy to a more codification strategy and could

imply more storing and codification of explicit knowledge. However, the management and organizational members of the Company want to stay innovative and develop unique products. Jansen (2006) recommended a shift to a more hierarchical culture, which implies that the culture should not be a hierarchical culture. It is more a combination. The FDA regulations and rules can be part of doing business and, therefore, a more personalized strategy can be followed.

5.2.2. Management support

Management support is recommended, because it is vital for a successful KM project. The organization should be aware of the economic benefits of KM and should believe that KM is critical for the future (Coleman, 2002). Higher management should take the lead when implementing KM companywide. They should not only send the message, but also participate in knowledge sharing. The management can create a visual link between business goals, problems or results, the overall style of the organization and core values (McDermott, 2001).

5.2.3. Individual costs

The public-good dilemma can be overcome by reducing individual's costs (Cabrera, 2002), which stimulates knowledge sharing. According to Cabrera (2002), individual costs can be reduced by (1) increase the efficacy, (2) creating a pay-off structure and (3) creating group identity and personal responsibility. The pay-off structure will not be discussed, because it was elaborated in section 5.1.6.

5.2.3.1. *Efficacy*

Providing a goal for KM can reduce the individual costs. People should be aware that knowledge sharing is important. A link can be created between knowledge sharing and core values, business goals, problems or results (McDermott, 2001). Also, utilizing champions or other key members to encourage other organizational members to share knowledge, can increase the efficacy of knowledge sharing (McDermott, 2001).

5.2.3.2. *Group identity and Personal responsibility*

Rewards could reduce the individual costs (Cabrera, 2002), however, a disadvantage is that organizational members could not sharing the proper information. According to Cabrera (2002), group identity and personal responsibilities act as social control. Social control arises by letting employees value each other. Enhancing communication and publishing information regarding knowledge sharing behavior of a participant encourage the social control (Cabrera, 2002). Social networks can be created, which contributes to aligning the organizational culture and knowledge sharing (McDermott, 2001). A collaboration tool can be used to stimulate networks among members.

In addition, the CEO announced that business units are established for vaccines and antibodies. Lotus Notes could be applied as a collaboration tool to prevent arising of barriers between the two business units as well as enhancing collaboration among different facilities and departments. Time should be provided or forced to engage in the collaboration and should fit in the daily work of the employee, because of the dynamics of the Company.

5.2.4. Change of behavior

The organizational and higher management should become aware that knowledge sharing is often critical for the organization. At the time of the research, awareness was lacking within the Company. Therefore, awareness and change in behaviour should be created. The higher management should communicate and link knowledge sharing with the organization. A crisis can be created or an event can be organized regarding the lack of knowledge sharing. KM tools should be provided and should support the knowledge sharing. Knowledge sharing can be linked with the business goals, problems, results, core values or the overall style of the organization (McDermott, 2001). The higher management should also be aware that the success and benefits of KM are difficult to measure. Good measurement tools are important to convince and show the management the benefits of KM. An attempt should be made to measure the success and benefits of knowledge sharing. For example, the amount of information shared with the collaboration tool and DMS can be measured. The contribution should be valued by means of rewards and appraisals. The disadvantage is that incorrect information and knowledge is shared by the organizational members. Therefore, organizational members should be value each other and made public. Suitable KM tools should focus on enhancing networks among organizational members to create a social network. The KM tools can be implemented, when the organizational members have accepted the lack of sharing within the organization. Suitable KM tools should not undermine the dynamics of the organization.

6. Evaluation of solutions

This chapter incorporates the evaluation of the knowledge management solutions, e.g. KM solutions. The evaluation was used to measure, to verify or falsify, the satisfaction of the participants regarding the purposed KM solutions. A survey was developed to execute the evaluation within the departments, library, scientific affairs department (SAD) and the communications department (CD). The different KM solutions are discussed according to the structure of the evaluation form. The evaluation incorporated the topics: goals and strategy, reward, investment, social network, meeting, collaboration tool, document management system (DMS), training and RSS feeds. Appendix B includes the survey questions and the answers of the respondents.

6.1. Evaluation results

An overview of the questions and answers is presented in table 6-1. The shaded boxes include grades, which were attached by the participants to the KM solution. The scale of grading is from 1 till 10 and represents the overall value of the KM solutions. The remaining boxes incorporated the number of satisfaction of the participant based on a scale from 1 till 5, respectively unsatisfied and satisfied. The answers of the SAD are not incorporated in the table, because insufficient or no evaluation form were filed by the participants of the SAD. Furthermore, two participants of the CD filed in one evaluation form.

Table 6-1, Overview of evaluation questions and answers of the participants

	Question	Lib1*	Lib2*	CD*
1	I am located in:	Lib	Lib	CD
2	How satisfied are you with the development of goals for your department?	4	2	3
3	How satisfied are you with the development of a strategy for your department?	4	4	3
4	Which mark would you give to the practice?	7,0	8,0	7,0
5	How satisfied are you with rewards?	4	3	4
6	How satisfied are you with a monetary reward?	3	4	4
7	How satisfied are you with a physical reward?	4	3	4
8	How satisfied are you with an increase in social recognition?	4	3	4
9	Which mark would you give to the KM practice?	8,0	7,0	6,0
10	How satisfied are you with investments in external information sources?	5	2	4
11	How satisfied are you with investments to overcome the problems associated with copyright?	5	2	4
12	How satisfied are you with investments to formalize the agreement regarding gathering information from the medical library of the University of Leiden?	5	2	3
13	Which mark would you give to the KM practice?	9,0	4,0	7,0
14	How satisfied are you with the creation of a social network	4	3	4

	Question	Lib1*	Lib2*	CD*
15	How satisfied are you with more time to enhance social networks and knowledge sharing?	4	3	3
16	Which mark would you give to the KM practice?	8,0	6,0	7,0
17	How satisfied are you with meetings?	3	4	4
18	How regular would you like to have a meeting/ year?	24	6	52
19	Which mark would you give to the KM practice?	7,0	8,0	8,0
20	How satisfied are you with the collaboration tool?	4	4	4
21	How satisfied are you with feedback?	4	4	4
22	How satisfied are you with the discussion forum?	4	3	4
23	How satisfied are you with the notifications?	4	4	5
24	How satisfied are you with the knowledge broker?	4	4	4
25	Which mark would you give to the KM practice?	8,0	7,5	8,0
26	Are you satisfied with the DMS?	3	3	5
27	Are you satisfied with the accessibility of documents?	3	3	5
28	Which mark would you give to the KM practice?	6,0	7,0	9,0
29	How satisfied are you with training regarding the use of a system?	4	3	5
30	Which mark would you give to the KM practice?	7,0	7,0	9,0
31	How satisfied are you with RSS feeds as a solution for monitoring external information?	4	2	4
32	How satisfied are you with personalized information?	4	2	4
33	Which mark would you give to the KM practice?	8,0	4,0	8,0

*Lib = Library and CD = communications department

6.1.1. Goals and strategy

A lack of goals was identified as a problem for all departments, however, the participants of the library and CD were indifferent regarding defining goals for the department. According to participant 1, goals and a strategy had been developed, but were not updated. The development of a strategy was more needed, than the development of goals. The participants know the goals of their department, but needed clarity regarding “how” to accomplish the goals of department. The grades of the participants indicated that the goals and strategies needed to be developed and that the KM solutions were accepted.

6.1.2. Reward

The KM solution “reward” was developed to increase knowledge sharing within the departments. According to the CD, this KM solution was needed within the R&D department of the Company, but not within the library and CD. Both departments are service-orientated departments and depend on the operational departments, however, rewards are necessary to stimulate knowledge sharing within the organization. Participant 1 from the library identified problems with measuring of amounts of knowledge sharing. This issue was incorporated in the KM solutions, but not described in the evaluation form. The rewards can be monetary, physical goods or social recognition. The participants tended to be satisfied regarding the way organizational members should be rewarded. The difference between the participants from the library can be explained regarding the opinions of both the participants regarding knowledge sharing. Participant 1 wanted to stimulate knowledge sharing within the organization whereas participant 2

believed that knowledge sharing will occur when it is needed. All participants agreed that the KM solution will increase knowledge sharing within the organization.

6.1.3. Investment

Investments in external information sources were intended to increase the scope of the organization, overcome the problem associated with copyright regulations and the informal agreement with the medical library at the Leiden University. Participant 1 from the library was satisfied, participant 2 tended to be unsatisfied and the communications department (CD) tended to be satisfied with the investments. Participant 1 from the library believed that sharing of knowledge and information was a top priority, which could explain the high grade and satisfaction. Participant 1 from the library wanted to provide direct access to external databases for the organizational members, however, a lack of control could cause a problem when total access is provided to the organizational members. Participant 2 was unsatisfied with the investments due to a reduction of its current tasks and the challenge provided by the current task. The CD had a tendency towards satisfaction regarding investments in external information sources. At the moment they make use of three external databases, Lexis Nexis, NASDEQ and Euronext, to collect knowledge, which was considered to be insufficient.

Participant 1 agreed with the investment to overcome the problems associated with copyright regulations. Participant 1 wanted to stimulate knowledge sharing within the organization and, therefore, agreed with the investment. Participant 2 disagreed with the investment in copyright regulations. Participant 2 probably disagreed, because scientific articles should not be translated. Translation can be time consuming, which can be not beneficial for the innovation process and R&D department. Furthermore, it affects the tasks of participant 2. The CD may have had the tendency to be satisfied, because they

could use additional staff and money to overcome the problem associated with the copyright regulations and capacity.

The gathering of information from the medical library of the University of Leiden is based on an informal agreement between the Company and the medical library of the University of Leiden. Investments are needed to formalize the agreement, which allows participant 1 to perform its tasks more correct. The dissatisfaction of participant 2 cannot be explained. The CD was indifferent regarding the gathering of information. The problem is not a problem for the CD.

6.1.4. Social networks

Social networks were developed to increase knowledge sharing, involvement with the organization and to overcome the island structure of the company. According to the ratings of the participants, most participants were satisfied with creating social networks and the KM solution. Participant 2 from the library was indifferent regarding the KM solution. This can be explained by the optimistic opinion of participant 2 regarding knowledge sharing. Furthermore, it is remarkable that the CD was indifferent regarding more time for enhancing networks within the organization. They are a service-orientated department, which was lacking internal knowledge and time. This can be explained by the lack of time that is presented in the department. The participants did not know when to incorporate knowledge sharing in their daily tasks. Therefore, a proper IT system and additional staff is necessary to support the CD and social networks.

6.1.5. Meeting

The participants were positive regarding the KM solution "meeting". Meetings should be organized to transfer tacit knowledge and increase the involvement of the departments with the organization. Participant 1 from the library believed that meetings only should be organized when necessary. The exact number of meetings differed among the departments and the participants of the departments. The participants from the library wanted either 1 or 2 per month or 6 times a year. The CD wanted to meet every week. The participants accepted the KM solutions.

6.1.6. Collaboration tool

The participants tended to be satisfied with the collaboration tool. A discussion forum was incorporated within the collaboration tool to provide feedback and to transfer explicit knowledge and information. The departments tended to be satisfied with receiving feedback from other departments via the discussion forum. Except, participant 2 from the library differed regarding the feedback via the discussion forum. The library has the tendency to be satisfied with notification, because it simplifies the tasks of library. The communications department (CD) needed on-time information and additional information to perform its tasks. Therefore, they are satisfied with notifications. Participant 1 from the library believed that the collaboration tool was an excellent tool, however, the organization should support the system and, therefore, it should be user friendly. The CD identified the problem of an overload of information, which could be time consuming. To overcome the problem of an overflow of information a knowledge broker should be appointed. All departments tended to be satisfied with the SAD as a knowledge broker, which could monitor and control the information flows and the success of the discussion forum.

6.1.7. Document Management System

The librarians were neutral regarding a document management system (DMS). The library are not going to use the DMS in comparison to the SAD and CD. The DMS is less interesting for the library. Participant 1 from the library was less positive regarding the DMS. The participant identified the importance of labeling, e.g. tagging, of information with metadata. According to participant 1, the DMS could also be restrictive regarding unstructured information. However, the DMS was used for structured information. In contrast, the CD was satisfied with the DMS. The problem of updating, finding and sharing information was solved with the DMS.

6.1.8. Training

Training is a mean to become familiar with a system and its benefits (KPMG, 2002). Training encourage knowledge sharing within an organization (Cabrera, 2002). The library accepted the KM solution. Participant 1 from the library had the tendency to be satisfied whereas participant 2 was neutral for the KM solution "training". The CD was satisfied with the KM solution. According to the CD, the problem of information overload could be diminished by providing training for organizational members.

6.1.9. RSS feeds

All the departments lacked external information regarding governmental, non-governmental, non-profit and commercial organizations. External RSS feeds could simplify the search for new pieces of information. Participant 1 from the library had the tendency to be satisfied whereas participant 2 was unsatisfied with the RSS feeds. Participant 1 described the RSS feeds as an excellent tool for personalized external

information. Participant 2 likes to search for information and, therefore, was not totally satisfied with the RSS feeds. The CD tended to be satisfied with the RSS feeds. The RSS feeds saved valuable time for the library and the CD.

6.2. Change of Knowledge Management Solutions

The first change within the KM solutions had occurred due to the evaluation. In the following sections these changes are discussed. A change of KM solutions should occur in the investments to overcome the problems with copyright regulations within the library. The translation of scientific articles, via outsourcing or additional staff, consumes too much time. The translations will decrease the organizational dynamics the research and innovation process. Researchers and research are the main assets of the organization. Reducing the organizational dynamics in the R&D department is not wishful and, therefore, has to change.

Furthermore, some of the KM solutions were not clearly stated in the evaluation form. One of the KM solutions was the meta-search engine. Metadata was mentioned in the evaluation form, however, a meta-search engine was not introduced as a tool. Logically, a meta-search engine should be incorporated to detect metadata and find the appropriate information. The folder structure and additional staff were not incorporated in the evaluation. The current folder structure should change, because it is ineffective and inefficient. The communication department (CD) needed additional staff to perform its tasks. This was recognized after the evaluation of the investment in KM solutions.

6.3. Conclusion

The participants had the tendency to be satisfied with the KM solutions, however, the evaluation was insufficient. The amount of participants and their responses were too low to perform a proper statistical analysis. Therefore, it is hard to draw conclusions regarding the KM solutions. The participants of the library and the communications departments (CD) were positive and optimistic regarding the proposed KM solutions. Some KM solutions were graded high, but the satisfaction of the participants regarding the KM solutions was low. The explanations of the KM solutions could be insufficient. No feedback or clarification could be given by the participants or researcher. The scientific affairs department (SAD) expected other KM solutions. No clear explanations were given or no evaluations form was filled by the SAD participants and, therefore, the SAD responses could not be incorporated within the analysis. An additional report was written to meet the expectations of the SAD.

Additional KM solutions were incorporated. The benefits of these KM solutions were acknowledged after the purchase of the evaluation. The additional KM solutions were portal, meta-search engine, additional staff. Change occurred within the investments and folder structure.

7. Conclusions and Recommendations

The conclusion and recommendation of this research are discussed in this chapter. The objective of the thesis project was to develop suitable KM practices for the Company, which should improve the performance of the organization. The research questions were derived from the goal of the research and the model of Verburg and Hoving (2007). The main research question and the sub-questions were:

- *Which knowledge management practices fit the knowledge management process and organizational aspects?*
- *Which knowledge management process should be improved?*
- *Which knowledge management practices can be applied?*

The limitations of the research are discussed before the research questions, conclusion and recommendations.

7.1. Limitations

The limitations of the project are given in this section. The first limitation was the scope of the KM project. The research focused on the library, scientific affairs department (SAD) and the communications department (CD). These departments are service-orientated departments. A lack of understanding regarding the operational departments. The knowledge sharing depends on the operational departments and the service departments. Problems could be caused by the operational departments instead of the library, SAD and CD.

The amount of participants within the departments is also a limitation. This was experienced during the evaluation of the knowledge management solutions, e.g. KM solutions. The number of surveys filed was insufficient to draw conclusions. For example, the KM solution "investment" was graded with a 9, 4 and 7. The 9 and 7 increases and the 4 decrease the average of the KM solution. The small amount of participants did not represent the whole organization.

The second limitation was the amount of KM practices, tools, systems and technologies. A lot of KM practices are available within the literature and could or could not be suitable for the Company. However, not all KM practices could be captured and, therefore, incorporated in this thesis report.

The third limitation was the survey. The KM solutions were not clearly stated, which resulted in wrong interpretations and a lack of understanding on behalf of the participants. A lack of feedback made it hard to analyze the results of the evaluation. Therefore, the use of structured interviews was more appropriate to evaluate the KM solutions within this project.

7.2. Conclusion

The research started with the exploration of the knowledge management literature, e.g. KM literature, and an investigation of the Company. The Company had a problem with finding, storing and retrieving knowledge and information. This caused problems for members of the library, scientific affairs department (SAD) and the communications department (CD). The departments were chosen, because knowledge sharing is an important part of the task of the departments. The departments depend on input of other

departments. The process of sharing was not optimal and, therefore, chosen for optimization. The departments could not perform its task effectively and efficiently. KM was recognized as a possible solution to solve the problem of the Company and its departments. Knowledge Management focuses on the improvement of an organization by utilizing technologies and considering the organizational aspects. The model of Verburg and Hoving (2007) was used to analyse the Company and enhance the performance of the departments. The current KM tools, the specific problems of the departments and the organizational culture were determined. Suitable KM practices were developed and recommended to the Company. Organizational aspects were taken into account, when designing the KM practices.

7.2.1. Outcome of the research

A single knowledge management process, e.g. KM process, was chosen and organizational aspects were determined, before the KM practices were developed. The KM processes are the main part of the theoretical framework of Verburg (2007), with a focus on innovations within networks. The model is applied within the Company to determine the KM process.

- *Which knowledge management processes should be improved?*

According to the participants, knowledge sharing is a problem within the departments, and throughout the whole organization. The problems that were identified can be associated with a lack of sharing within the library, scientific affairs department (SAD), communications department (CD). The three departments are service-orientated and, therefore, depend on other departments. A lack of knowledge sharing obstructs the

performance of the departments and organizational members to perform their tasks effectively and efficiently. Therefore, the KM process "sharing" was chosen for optimization by the participants. However, other processes are involved within the KM process "sharing". Knowledge should be gained to be able to share knowledge. Knowledge is often gained from information (Jashapara, 2004). Information can be organize, captured, stored, evaluated and shared. The KM processes are also part of the KM process "sharing". So, to improve the KM process "sharing" in the case study, these processes should also be taken into account and improved. Knowledge and information can be find, stored and retrieved with the purposed KM practices. So, there is no single KM process for optimization, because there are several KM processes associated with sharing. Furthermore, knowledge sharing can be stimulated, coordinated and managed. These are also KM processes that are part of the KM process "sharing".

- *Which knowledge management practices can be applied?*

Various KM practices can be applied within organizations, however, this depended on the organizational aspects and the KM processes. Every organization is different and, therefore, not all KM practices can be applied. Organizational aspects that were taken into account are the organizational culture, mission, vision and goals, products, structure, current systems and organizational members. The integrative model of Weggeman (2000) also presents organizational aspects. KM tools were developed to support networks among the organizational members instead of heavily investing in database technologies. More personalized KM practices fit the Company, because of the organization culture and dynamics of the organization. The choice of the KM process "sharing" limited the number of the KM practices that could be applied within the case study. Specific KM practices were chosen for the problems of the departments. The KM

practices focused on sharing of tacit and explicit knowledge and information between individuals and groups.

- *Which knowledge management practices fit the knowledge management process and organizational aspects?*

Several KM practices could be applied within this project, however, it depended on the KM process and organizational aspects. The KM practices regarding sharing of knowledge and information were emphasized. Informal and personalize KM practices fit the Company and the KM process "sharing", because of the organizational dynamics, organizational culture, products, vision, mission, goals, strategy, organizational members and the structure of the organization. A personalized approach can be applied, although, a more hierarchical culture was recommended by Jansen (2006). More formalization and structuring was needed, because of the increase of the size of the Company.

In terms of KM strategy, a personalized KM practices should be applied. According to Hansen (1999), a personalization strategy consists of 80% personalization and 20% codification. This research was situated within the 20% of the personalization strategy. The transfers of tacit and explicit knowledge were taken into account. The recommended KM practices stimulated networks among organizational members. The KM practices support the organizational dynamics, which is often beneficial for the creativity of the organizational members and the innovations of the organization.

Some KM tools were already applied within the Company to stimulate networks and sharing of knowledge among organizational members or to find the appropriate information or person. Examples are the Who-is-Who and the social drinks. Tacit knowledge can be transferred in a social environment and explicit knowledge can be

transferred via the yellow page. The recommended of KM practices were develop for the specific problems of the departments. Therefore, other KM practices can be applied throughout the whole organization.

Sharing of information and knowledge can be improved by the KM solutions. Information and knowledge can be shared using the KM tools. In our case study, the use of a collaboration tool, document management system, meetings, rewards, investments and additional staff was sufficient and fits the departments and organization. The responses of the participants regarding the KM solutions were positive. The purposes KM solutions changed the way of working of participants. The library and scientific affairs department (SAD) have additional tasks. The communications department have more time to perform its tasks. The behavior of the organizational members should also change. The organizational members should be aware that knowledge sharing is important. Several KM tools were developed to support the organizational members with sharing of tacit and explicit knowledge and information. This influence other departments, because of the interrelation. The purposed KM tools support the processes storing, organizing, capturing, sharing, managing, coordinating and stimulating of knowledge and information within the Company.

7.3. Recommendations

The KM tool often support the KM practices. Therefore, KM tools were developed for the organizational member and to support the task of the organizational member. The KM tools also support the KM process "sharing".

The recommended KM tools are:

- defining goals and a strategy for the departments
- a document management system, which a portal, internal RSS feeds and a meta-search engine.
- a collaboration tool which a discussion forum
- a change of folders structure
- external RSS feeds
- rewards
- additional staff
- investments
- meetings

These KM tools support the organizational members with sharing of knowledge and information. Organizational members could find, store and retrieve tacit and explicit knowledge and information by utilizing the KM tools.

The goal of the research was to recommended suitable KM practices, which could be used to increase the performance of the organization. Therefore, organizational aspects were taken into account, such as the dynamics and organizational culture. According to the cultural study of Jansen (2006), the culture of the Company can be described as an adhocracy culture, but will change to more hierarchical culture. This implies an increase in rules, formalization and structure (Cameron and Quinn, 2006). The recommended KM solutions will provide more structure and will enhance the knowledge sharing within the departments and organization. The recommended KM practices support the transfer of tacit and explicit knowledge and information between individuals and groups. However, a change in behavior regarding knowledge sharing should occur first.

7.4. Additional research

Additional research is recommended. Additional research should be performed in the R&D department, a cultural research within other facilities and the development of measurement tools.

There was a lack of understanding regarding the R&D department and other facilities. The researchers are the main asset of the Company. If the Company want to implement KM companywide, additional research needs to be performed within the departments and facilities before introducing KM tools. Not all KM practices mentioned in the case study can be applied within the whole organization, and, not all KM practices were relevant for the case study, but are relevant for the success of KM companywide.

A cultural study needs to be performed within the other facilities. A clear notion regarding the organizational culture of all facilities should be established. The other facilities could have different cultures, which could cause problems when introducing KM practices. The culture could not be open for improvement or KM. A mismatch of culture could rise and could cause failure of the KM project within the organization.

Measurement tools should be developed to evaluate knowledge sharing within the Company. Additional research is necessary to determine the proper measurement tools for the Company. Measurement tools are important to convince and show management the benefits of KM. The difficulty is "how" to measure knowledge or knowledge sharing. Organizational members could share useless knowledge.

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Appendix A: Summary interview

Business strategy

- Q1 What are the goals of the department?
 Q2 Which strategies are used to reach the goals?
 Q3 What are the future goals of the department?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
1	(1) No documents. (2) Facilitate (scientific) information on and without request.	(1) No document. (2) Facilitate literature with and without request in a fast manner.	(1) No defined. Tacit knowledge (2) Secure the scientific reliability and consistency of presentations of the communication department.	To secure the scientific value of the presentations and articles.	(1) No real goal written down (2) Disseminate information in a timely manner throughout the company and externally.	(1) Not defined. (2) All stakeholders facilitate with right information (two ways).	(1) Not defined. (2) To be known in the outside world and create a positive attitude by the stakeholders
2	A request is comes in, processed, and shared via network/ personal folder structure, intranet and/or email.	Use Pubmed.	(1) Stay close to the results of the study. (2) Software for analyses or graphic representation: prism, sas and spss; No Excel.	Powerpoint, Word, Meetings with CSO, Articles, Scientific Advisory meeting.	No strategy; We have processes. News is disseminated via Internal memo, Intranet, Presentations, Conference calls, and Webcast.	No strategy defined. Practical, strategically goals: Internal communication structure, Cultural awareness, Knowledge about the organization.	Share correct information and increase visibility of the organization.
3	No local storage. Knowledge center, which provide information to all locations worldwide. A system has to be developed that allows the Company employees to access documents/ scientific articles worldwide.	No real future goals; Future goals should be determined; Handling of request do not need a change. The way of working is okay; better view about international cooperation of Libraries. It can be more efficient and coordinated centrally.	No future goals due to facilitating character of the department.	Information/ sciences in articles, publications and others documents should be organized, structure, up-to-date and accessible, which can be communicated in a correct manner via analysts meetings, press releases, and presentations by BD/CEO/R&D.	More structure should be in the department. This is a challenge due to understaffing.	Future goals are becoming more nuances, but stay the same (e.g. Listen and inform stakeholders; Two ways).	Structure the department to communicate better to our environment

KM Processes

- Q4 Which KM processes are applied within the department? (Discovery, generating, evaluating, sharing and leveraging)
- Q5 Which KM processes are currently emphasized? Which KM processes should be emphasized? Can you attach a degree of relevancy to the KM processes?
- Q6 What is necessary to discover, generate, evaluate, share and leverage knowledge?
- Q7 How is knowledge discovered, generated, evaluated, shared and leveraged? Which is preferred?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
4	Applied: Generation/ Sharing	Applied: Sharing	Applied: Discovery/ Evaluating	Applied: Evaluating/ Sharing. Less: Generating and Leveraging.	Applied: (1) Sharing/ Leveraging, (2) Evaluating, (3) Discovery, (4) Generating.	Applied: Discovery/ Generating	Applied: Generating/ Evaluating/ Sharing
5	Emphasized: Generation/ Sharing. Should be: Sharing.	Emphasized: Sharing. Should be: Sharing.	Emphasized: Discovery/ Evaluating; Should be: more sharing; Degree: (1) Discovery, (2) Evaluating, (3) Generating, (4) Sharing and Leveraging.	Emphasized: Evaluating/ Sharing. Sharing should be better and more reliable.	Emphasized: Sharing/ Leveraging. Should be: Sharing should be better. Structure, Qualifying, Disseminate (Evaluating; present the amount media clipping per month)	Discovery en Generating is emphasized; Should be: Sharing	Emphasized: Generating/ Evaluating/ Sharing Should be: More generating/ More evaluating/ More sharing
6	New intranet (portal), which can be personalized.	A better structure to find employees within the company. Accessibility to databases	Discovery: good experimenters/ study plan/ hypotheses/ researchers; Evaluation: Did you reach the goals of the project? Sharing: Sharing is not common.	Better structure, Authorization, Support of the higher management.	CRM/ Intranet/ Newsletters/ Internal memo/ Webcast/ Press releases.	Understand each other why sharing of knowledge is important.	Generating: Search for info, when it is necessary. Ad hoc Evaluating: Self filtering
7	Lobbying/ Email.	Email/ Folder structure. No contact with Scientific Affairs.	Experiments, hypothesis, researchers, work/ school experience, basis knowledge, models, email	Internal: Folder structure, Shared inbox/ folder. External: Annalists meeting, Press releases, Presentations BD, CEO, Scientists	Email; Joint server/ folder; once a week meeting (Not happen every week); Verbal communication.	Informal, Ad hoc, meetings Shared folders structure; should not be changed; Everybody within the department knows how to act within the structure. Lobbying, shared email box, Press releases	Newsletters, Press releases, Websites Personal contact, Presentations, Euronext/ Nasdaq database, Meetings Email, Self

KM Practices (1/3)

Q8 What practices, technical and non-technical, are used within the department to support the KM process? Which are emphasized and should be emphasized? Which do you prefer?

Q9 What are the disadvantage and advantage of the current KM practices?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
8	Email alerts, Shared personal folders, Intranet, Informal meeting.	Oral and Email (shared mailbox). Folder structure	Presentations (internal and external)/Powerpoint. Software for analyses and graphic representation (Prism, SAS, SPSS); Email or documents (depending on embargo); Personal folder structure. Structured by name (person) and then by subject. This is shared with R&D managers. Intranet (who-is-who and webcast); Internet; Weekly meetings. Informal, Lobbying. Social drinks	Powerpoint, Word, Lobbying, Email, not much meetings	Internal: Email, Folder structure, Intranet, Memo. External: Lexis Nexis, Webcast, Conference call, Press releases, CRM system.	Meetings (with Management). Folder structure. Email box, Lobbying, Contact with managers, personal contact, press releases.	Euronext/ Nasdaq database, Press releases Websites, Personal contact, Presentations, Meetings, Email, Lexis Nexis, Email alert.
9	<p>Advantage: information specified for person in a personal folder structure. Person receives an email where to find the information.</p> <p>Disadvantage: (1) It's the information is not shared with others, because it is depending on others. (2) The management does not have a tool to encompass all knowledge within the company. No search function/ indexing. Participant 4 should indicate keywords. Gathering of info from the university of Leiden is not done in a proper manner, due the priority of the organization/ no time.</p>	<p>Advantage: Email: Fast, Stored, Easy access of employees; Easy access of the Library; Informal.</p> <p>Disadvantage: (1) No feedback; (2) no evaluation, indication of the value of the information. People should know which information is important for the Library. (3) No communication between the different locations and departments. (4) The librarians are no scientists, so Participant 4 should indicate which articles are important. They cannot judge the value of the articles. (5) The structure of the folder structure. Hard to find people</p>	<p>Disadvantage: No structure. No update. No feedback, updating is depending on others. Email: Not sufficient, because of embargo. Personal folders, not subject/ product orientated. Not shared with Library and Communications. All documents are saved. Island structure. Intranet: Not much information. Personal folder structure Library: requested information is not shared within R&D (No need).</p>	<p>Disadvantage: (1) Personal folder structure. Local storage. Information is not shared with others. (2) Some information cannot be shared. (3) Information is gained from another source. No security of accuracy and reliability. It should be checked by SA. (4) Multiple similar files at different locations. (5) No feedback of others due the lack of a "sharing" structure.</p>	<p>Advantage: Michelle uses the CRM system for institutional investors and analysts.</p> <p>Disadvantage: (1) CMS out of date. Not easy to use. (2) Information is not well structured due to capacity/ time. (3) Knowledge shared with a limited group of employees. Lexis Nexis: only printed media.</p>	<p>Disadvantage: (1) Local storage. Not knowing what is happening within other departments due to (2) lack of time and (3) often changes within the department. Information need is increased. Working ad hoc and insufficient preparation. There was a lack of leadership. Folder: (1) is not shared with others. (2) Hard to share. Does not secure the sharing with other locations</p>	<p>Disadvantage: Ad hoc working style, no planning; Lack of long-term view; Lack of time; finding appropriate and available people; No on time information; No scientists.</p> <p>Advantage: No scientist; Press releases: informing internal and external.</p>

KM Practices (2/3)

Q10 What are the needs and bottlenecks of the current KM practices? Does the practices work properly? Why (not)?

Q11 Is the situation changed after the mergers? How? What is changed?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
10	<p>Need: (1) Providing proactive information to project managers. (2) Tools to encompass information better/ efficient. (3) Easier to post information on intranet. Total policy around Library.</p> <p>Bottlenecks: (1) People maybe not willing to share information. (2) Departments are island. Not aware of which info is available within the company. There is an overlap of tasks between Lib and Com. Provide insights of info are important. (3) No feedback. No clue what management wants? Sharing is not a priority.</p>	<p>Need: Evaluation of information. Easy handling. Feedback. Cooperation between locations. Easy finding of employees. Technical solutions should not be change. Non-technical thinks are more important. A discussion with Participant 4 is necessary. Better leadership. Lack of attention. Internal information. No contact internally. Copyright is a gray area.</p>	<p>Need: (1) One platform where collections of recent presentations are: structured by subject, date, calendar (multiple access), Presenter, Place (tags). Finding the proper presentation/ article/ slides in the system. (2) Structure. Information should be better shared with BD without direct selling of the information. Accessibility, Authorization. Shared structure within Library and Communication. Bottleneck: (1) No feedback from the users. (2) Sharing can be better. (3) Intranet: No sufficient enough. Only articles and news bullets. (4) Update of documents depending on emails. (5) Island structure.</p>	<p>Need: Better structure; Several departments should be include. Qualification. Updating presentations. The most up-to-date presentation should be available. Large database. Accessibility. Authorization. Shared structure. Knowledge broker.</p>	<p>Need: (1) Dissemination/ sharing of information is a problem throughout the Company. (2) RSS feeds for internal communications.</p> <p>Bottlenecks: (1) Structure of the system. (2) Time and capacity. Understaffed, structure is not a priority by management. (3) Everybody has their own folder with knowledge. Island structure. (4) Media clippings: copyright rules are a problem. Articles are paraphrased to make sharing possible. Expansive. (5) Structure of the department. (6) On time information. (7) Island structure: communications as well.</p>	<p>Need: Know what is happening in other departments/ locations, Better preparation, More and on time information. Elaborated information</p> <p>Bottlenecks: (1) Lack of time. (2) Changes. (3) Island structure. (4) Hard to find people. (5) Lack of capacity.</p>	<p>Needs: Structure; one system with all information; easy to use, easy to find. Well categorized, correct tags</p> <p>Bottlenecks: lack of time; Lack of long-term view; ad hoc working style, no planning. Finding appropriate and available people; Local storage; updating of presentations; distance to management.</p>
11	<p>No changes; Strange, because other facilities should be interested in news. No research in other facilities.</p>	<p>No change. No contact with other facilities. Island structure</p>	<p>No change. Communication with other facilities can be improved. No research in other facilities.</p>	<p>No change; Less contact. Medical Affairs is erased.</p>	<p>Increase of workload. No a lot of contact and exchange between other facilities and the Company, but there is no communications department within other facilities. Because of understaffing, they cannot meet the need of other facilities.</p>	<p>No change. Remarkable because you expect a growth within the department. No communications department</p>	<p>No contact, because there is no communications department. Increase of information/ workload</p>

KM Practices (3/3)

Q12 What are the criteria's for the future KM practices? How should the future KM practice look like?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
12	(1) Authorization; (2) Access to scientific literature; Everybody should have access to knowledge; (3) How do you handle publications, publishers adopt the copyright; in this way sharing of knowledge is difficult.	(1) Folder structure should be erased and new structure by name. (2) Library should know what the customer/ employees want (qualify). Feedback. (3) Communications with other departments. (4) Speed.	To tag the practices; data warehouse. Authorization, accessibility, updated/ feedback	Structured per product, qualification, authorization, accessibility, updated and correct information	Structure of the system, Accessibility to the appropriate people, Authorization, Qualification, Easy to use, Easy access, Logical system/ setup.	Speed, Completeness, Accessible from different locations, How to use the practices, Desire to share. Only interested information.	One system; Authorization; Qualification; accessibility

Culture (1/2)

Q13 How would you describe the organizational culture? How does the department distinguish itself from others? What are the differences?

Q14 What is typical for your department? (Clothing, time, helping, openness, coffee, humor, ect)

Q15 Do you want to discover, generate, evaluate, share and leverage knowledge with others? Why (not)?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
13	Library works for internal customers; Informal.	Informal, no structure.	Young, Dynamic, Openness for improvements; No idea of "Can do" culture	Open, helpful, direct, flexible	Informal, Not a lot of meetings, Only when the topic takes a lot of time, a meeting are scheduled, Quick conversations. Ad hoc.	Open; Work hard; Enjoy to work hard.	Flexibility, Ad hoc, Open, Supportive, No hierarchy
14	Single organization within the Company. Outsider; Email orientated and personal contact; The Library want to be supportive and open. Try to stimulate employees to gain knowledge within the Library, by offering scientific and department related magazines.	Facilitation attitude/ perspective. Skillful.	Young, Dynamic, Openness for improvements; No idea of "Can do" culture	Direct, open, immune to stress, flexible	Flexible, Tight deadline, Express yourself (not introverted). Changeable department.	Open; Work hard; Enjoy to work hard.	Open, No hierarchy, short lines, responsive, no meeting culture, quick decisions, informal, "Can do" mentality.
15	Yes, because it is the main task of Library.	Yes, sharing is the task of Participant 2.	Yes	Yes. It is necessity. To grow as a company	Yes, definitely.	Yes, because we are depending on others. We must share knowledge.	Yes, absolutely. Providing information to the market.

Culture (2/2)

Q16 Why are you using the practices? Are they norms and values of the department? Are they common? Why (not)?

Q17 Are you willing to use other practices or are there enough practices in place? Why (not)?

Q18 Are the types of practices depending on the type of employees? Are they different from others departments?

Q19 Why should knowledge be discovered, generated, evaluated, shared and the leveraged?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
16	The practices are passed by the organization. Due to the growth, no attention is given to the practices within the Library. Intranet not evolved with the company.	Email: Always reach employees, No bothering of employees, No paper, Speed, Direct, Costumers can read the information on another time.	To do my job in statistical analyses	Word and Powerpoint is a standard software program / meetings are common/ documents are shared (e.g. Supervisory meeting).	Department developed the folder structure. Experience, Common sense.	History.	Press releases: It's the best way to inform people. Sending press release is forced by law. Presentations: reach of large group
17	Yes; Participant 1 wishes nothing else.	Yes, if it is necessary to support the customer.	Yes, open for new developments.	Yes, if they become available.	Yes, if easy to use. No complexity.	Yes.	Yes; current situation is insufficient.
18	Practical experience internet technologies/ new problems are handle by Participant 1. Participant 2 handles requests.	Participant 2 wants quick handling of requests.	Yes, the analyses/statistics software programs	No	To get information out of people. Judge the situation. Nice, amiable, trying to persuade people to help you; If you don't get the info, you should be a little bit rigidly. Easy going with a variety of people.	Empathy; Open, Curious, Inquisitive, Conscience of the organization, Selective. Interruption of scientific information without being a scientist.	Euronext/ Nasdaq database. Bank of New York
19	Difficult question; Participant 1 thinks that the management has other priority and sharing is not stimulated. When knowledge is needed, knowledge can be asked for. Person interprets the knowledge and then it stops or shares the info with colleagues.	Knowledge is needed to accomplish things. No new development without knowledge.	Sharing: There is a lack of knowledge about what is happening within the R&D department in the company. Knowledge should be shared.	Increase of value; add value and gain knowledge	Sharing: Necessity. Knowledge should be shared to reach a goal. Leverage: For the benefit of the company; Forces by law (FDA) to release information.	Reputation of the company, Steering, What is happening within the organization. FDA regulations.	SEC/ Euronext regulations. Located on the stock exchange.

Knowledge domains (1/2)

Q20 What kind of knowledge is discovered, generated, evaluated, shared and leveraged?

Q21 Who uses the knowledge?

Q22 What knowledge is relevant for the department? Why (not)? What knowledge is the department lacking?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
20	Scientific literature, Bio/Medical magazines, Articles. General magazines	Scientific knowledge. Informal with Participant 1: social and organizations developments.	Reports, Publications, Presentations.	Scientific information and articles are utilized for the presentations; Research programs (antibodies/ vaccines/ malaria/ pipeline/ products/ others). General: Vaccines/ Vaccine development/ Proteins/ antibodies/ vectors of coagulation of blood with the goal to commercialize.	Anything: News to send out internal and external. To motivate employees; Success of the company. Media clippings. Investors, annalists, media.	Brought view: financial, new developments, change of position, products, programs, licenses.	Internal information (programs status, ect) for externals, Annalists reports
21	R&D.	R&D.	CSO/ Communication/ BD/ Participant 4.	CSO/ CEO/ Higher management/ Communications/ BD	Management	Communication; Variety of means to communicate with stakeholders, no proper structure.	Internal: Higher management, Participant 4. External: Market: Annalists, Customers, Shareholders
22	Relevant: Scientific information; (1) Lacking of knowledge is hard to determine due to the island culture. No clue about information flows of other departments. All knowledge is interesting for the Library. (2) Congress information, press releases. (3) Lack of knowledge about other departments. (4) New websites. (5) Products information. (6) Web news	No relevant information is needed, standardized work. Based on experience/ routines. For the welfare of the Library, something has to change. No challenge, no development. Where to find the knowledge; Which databases (Pubmed, University of Leiden); Passwords Lacking: (1) Lack of future perspective. Lack of knowledge about the future. (2) Growth of the department. Therefore, new knowledge is needed. (3) Lack of knowledge about other departments	Relevant: Epidemic and Scientific papers. Lacking: Information of R&D information at other departments/ congress information/ magazines/ relevant articles/ Competitors.	Relevant: Scientific information; articles; Research programs (antibodies/ vaccines/ malaria/ pipeline/ products/ others. General: Vaccines/ Vaccine development/ Proteins/ antibodies/ vectors of coagulation of blood with the goal to commercialize. Lacking: All publications in Pubmed/ WHO/ International Pharmaceutical Manufactory Association/ Competitors/ Other facilities programs/ Governments/ grants. Feedback Marketing/ Sales information. SA as knowledge broker between M/S and R&D. The outside world	Relevant: Press releases. Media clippings Lacking: Internal information (last minute); Other online news articles/ websites (only printed media); Product information about other facilities. Wall streets Journal	Relevant: Scientific programs. Lacking: (1) Scientific programs: Which programs, Status, Involved (third party), (2) On time information, (3) Elaborated information, (4) Knowledge about other departments (e.g. internal information). External information: Competitors information	Relevant: Stock Exchange information: Volume, investors, annalists, flow Scientific Affairs: Annalists reports, last presentation. Library: Media clippings, Congress information. Lacking: Internal information; Scientific knowledge as a person; correct information; Newswires (e.g. Reuters, Associated press), programs.

Knowledge domains (2/2)

Q23 Can you indicate to what degree which items are relevant?

Where is the knowledge coming from? Experts, databases, external, internal, profit organizations, non-profit organizations, governments, universities, competition, other

Q24 facilities, ect?

Q25 How do you collect the knowledge? Phone, email, internet, TV, radio, colleagues? Which one is emphasized and do you prefer?

Q26 Who is requesting the knowledge? Which departments and/or persons?

Q27 What kind of knowledge is requested?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
23							
24	University of Leiden, WHO, CDC, CIDRAP, Google, Yahoo, Email alerts, Websites. Infections disease society.	Pubmed, University of Leiden, Science Direct. Magazines, Company in the US. Email alerts. Database publishers	Internal: Prism/ SAS/ Spss/ Library/ CSO. External: IAVI/ MVI/ NIG/ Internet/ Scientific magazines/ Newspapers/ R&D	R&D/ CSO (network)/ Library/ Articles.	Lexis Nexis, Websites, Yahoo, Google search, Email alert, US and Europe, Employees. Dutch PR company. Less contact with Library	Participant 4, Management, Experts, Annalists, Department Managers and Externals	Bank of New York, CRM, Email alert, informal meetings, Yahoo, Participant 6, Lexis Nexis, shareholders, websites/ databases, Annalists. No contact Library.
25	University of Leiden, Email, Email alert Communications collects own information	Email alerts, Websites, Company in the US, Pubmed, Google, Databases of publishers/ University of Leiden, Magazines.	Prism/ SAS/ Spss/ Less Excel/ Folder structure/ Newspapers/ Scientific magazines/ Emails/ CSO: network, people, papers, journals, and books.	Email, Internet, CSO, Lobbying, Library (email alert).	Lexis Nexis. Library on request (one way traffic).	Informal meetings, Google, Google alerts, Specialists literature, Ad hoc.	CRM, informal, meetings, Participant 6, Lexis Nexis, websites/ databases, Participant 4, personal contact, canteen.
26	R&D.	R&D, Project managers.	Communications/ BD	CSO/ BD/ Communications/ Marketing & Sales/ R&D	Management.	All stakeholders: Media, Analysts, Investors, and Employees. Management. Externals	Higher management, Participant 4. Markets: Analysts, shareholders, investors.
27	Scientific information: Articles, Magazines, Websites.	Scientific papers/ articles.	Epidemic, Scientific, Competitors.	Scientific information; Articles; Research programs (antibodies/ vaccines/ malaria/ pipeline/ products/ others). General: Vaccines/ Vaccine development/ Proteins/ antibodies/ vectors of coagulation of blood with the goal to commercialize.	Press releases, Article about specific topics, Media clipping.	Brought view: Financial, New developments, Change of position, Products, Programs, Licenses.	Internal and external information. Media clippings, programs

Others

Q28 Do you have any additional comments?

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7
28	<p>If the management chooses the current structure, it's okay. If the management supports worldwide sharing of knowledge: A structure should be applied very soon, due to the mergers. Worldwide cooperation, no more islands. We cannot work like this anymore.</p>	<p>Participant 2 hopes that there will be some changes.</p>	<p>Evaluation of a concept.</p>	<p>Evaluation of a concept.</p>	<p>Participant 1 knows the best what should be in the KM system. The CSO originally initiated KM. It should be a place where you want to look at on topic and pull up all relevant articles about the chosen subject that are printed and external articles, press releases. Large database. Search on different categories. This is not available within the Company. Information is separated in different department.</p>	<p>Participant 6 likes functional platforms and participant 6 thinks it is a challenge to develop a cross-functional practices. Brought view.</p>	<p>No comments</p>

Appendix B: Evaluations forms and answers

Evaluation

Hello participant,

After we had an interview, I processed the interview and identified the problem of the three case studies (e.g. Library, Scientific Affairs and Communication). During the problem analysis, different as well as similar problems were identified within the departments and between participants. Afterwards, I performed an in-depth literature study and made a selection of KM solutions. Hopefully, the selected KM practices fit your wishes and the organizational culture. The goal of this evaluation is to determine your satisfaction. The duration of the evaluation is approximately 15 minutes. You can answer the question on the basis of numbers, which are ranging from unsatisfied (1) to satisfied (5). First, a general question will be asked followed by the presentation of the solutions. Every solution is presented on one page.

General

1. I am located in:

	The Library
	The Scientific Affairs department
	The Communications department

Goals and Strategy

During the interview, it was said that the goals and strategy of the department were not defined. However, goals and strategies can provide structure and future perspectives to your department. Therefore, goals and strategies should be defined. In general, goals are defined as “What should be accomplished in a certain time period” and the strategy as “How the predefined goals can be accomplished”. The goals and strategies can act as guidelines for your daily tasks.

2. How satisfied are you with the development of goals for your department?

1	2	3	4	5	NVT

3. How satisfied are you with the development of a strategy for your department?

--	--	--	--	--	--

4. Which mark would you give to the practice?

Additional comments regarding the development of goals and a strategy?

Rewards

According to the interviews, sharing of knowledge should be optimized. A reward can provide an incentive to sharing knowledge within the organization and your departments. Assuming that you or a colleagues have no time or get no stimulus to sharing knowledge, you will not share knowledge. By providing a reward, you can be compensated. This reward can be monetary (e.g. stocks and money), physical items (e.g. car and dinner) or an increase of social recognition (e.g. status and medals).

- 5. How satisfied are you with rewards?
- 6. How satisfied are you with a monetary reward?
- 7. How satisfied are you with a physical reward?
- 8. How satisfied are you with an increase in social recognition?

1	2	3	4	5	NVT

- 9. Which mark would you give to the KM practice?

Additional comments regarding the rewards?

Investments

In the interview, it was acknowledge that there is a lack of external information sources. Investments can solve the problem. It allows the Library and the Communications department to access the databases and retrieves information regarding scientific information (e.g. articles) and the Company (e.g. media clipping and newswires). A second investment is needed to overcome the problem of copyright. At this moment, copyright obstructs information sharing. the Company has to pay a fee for every downloaded article. The communications department uses an expensive external PR organization to rewrite articles (only Dutch articles). A new employee could rewrite the articles or more money should become available to buy and share articles. I think a third investment is needed to gathering of information in a proper way from the medical library of the University of Leiden.

10. How satisfied are you with investments in external information sources?

1	2	3	4	5	NVT

11. How satisfied are you with investments to overcome the problems associated with copyright?

--	--	--	--	--	--

12. How satisfied are you with investments to overcome the problems of gathering information form the University of Leiden Library?

--	--	--	--	--	--

13. Which mark would you give to the KM practice?

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Additional comments regarding the investments?

Social networks

During the interview, some participant identified that there is a lack of internal information and an island structure. Also, problems regarding to find and access information were acknowledged. Social networks enhance the interaction and communication between you and your colleague. To allow a social network to be successful, four criteria should be fulfilled. The first criterion is that you and your colleague should have time and be accessible. Secondly, you and your colleague should know each other's knowledge and, third, you and your colleague should be willing to engage in problem solving. The fourth criterion of social networks is the promotion of a degree of safety, which allows you and your colleague to learn and be creative. The social network allows you and your colleague to find and access each other and share information.

14. How satisfied are you with the creation of a social network?

15. How satisfied are you with more time to enhance social networks and knowledge sharing?

16. Which mark would you give to the KM practice?

1	2	3	4	5	NVT

Additional comments regarding social networks?

Meeting

Some participants acknowledge a lack of communication with their supervisor, which obstructs the access of information. Regular meetings stimulate interaction and can improve the communication between you and your supervisor. This allows you to access information and knowledge.

	1	2	3	4	5	NVT
17. How satisfied are you with meetings?						

18. How regular would you like to have a meeting?

19. Which mark would you give to the KM practice?

Additional comments regarding meetings?

Collaboration tool

During the meeting, a lack of feedback, a lack of internal information, island structures were identified as problem. A collaboration tool can provide communicate, cooperate, and coordinate knowledge and information. The collaboration tool enhances interaction between you and your colleague at similar and different locations and time. You can receive feedback via discussion forum from other facilities, departments and individuals, which will increase the effectiveness of the contribution. The Library can notify members of the organization regarding request of articles. The benefit of a discussion forum is that the information is stored and you can read the message at different times and places. The information is stored and made visible. Notification (e.g. RSS feeds) can inform you about new-posted messages and information. This will personalize your information. The Scientific Affairs department can act as knowledge broker. They can supervise and control the discussions as well as the information flows.

- 20. How satisfied are you with the collaboration tool?
- 21. How satisfied are you with feedback?
- 22. How satisfied are you with the discussion forum?
- 23. How satisfied are you with the notifications?
- 24. How satisfied are you with the knowledge broker?

1	2	3	4	5	NVT

- 25. Which mark would you give to the KM practice?

Additional comments regarding the collaboration tool?

Document Management System (DMS)

According to some participants, there was a lack of a proper system. Information was scattered across different locations. The information was hard to update. A Document Management System (DMS) controls the information flow between you and another colleague. Different levels of authorization can be applied, which can or cannot restrict you and your colleague to access information and documents. A DMS controls and allows modification of one document at the time and tracks the modifications of the documents for you (e.g. audit trail). The documents can be labelled with information about the document (e.g. metadata), which allows you to search and retrieve the proper document in time. The documents and information are store in a single database and are organized in groups and folders. The DMS allows you to share general (e.g. articles, media clipping, ect) and confidential information.

26. Are you satisfied with the DMS?

27. Are you satisfied with the accessibility of documents?

28. Which mark would you give to the KM practice?

1	2	3	4	5	NVT

Additional comments regarding the DMS?

Training of the systems

To prevent misunderstanding of the collaboration tool, the DMS and RSS feeds, training should be provided to you. Training increases your understanding of the KM practices and increase effectiveness of knowledge sharing (e.g. proper use).

29. How satisfied are you with training regarding the use of a system?

1	2	3	4	5	NVT

30. Which mark would you give to the KM practice?

Additional comments regarding the training?

RSS feeds

RSS feeds (Real Simple Syndication) allow you to personalize information flows. By using RSS feeds, you can gain information about competitors, WHO, US government and other external information sources. The information will be visualized. The RSS feeds will provide you with a notification, when information is updated and becomes available. This will save time.

31. How satisfied are you with RSS feeds as a solution for monitoring external information?

1	2	3	4	5	NVT

32. How satisfied are you with personalized information?

--	--	--	--	--	--

33. Which mark would you give to the KM practice?

--

Additional comments regarding RSS feeds?

Thank you for the cooperation.

Evaluation

Hello participant,

After we had an interview, I processed the interview and identified the problem of the three case studies (e.g. Library, Scientific Affairs and Communication). During the problem analysis, different as well as similar problems were identified within the departments and between participants. Afterwards, I performed an in-depth literature study and made a selection of KM solutions. Hopefully, the selected KM practices fit your wishes and the organizational culture. The goal of this evaluation is to determine your satisfaction. The duration of the evaluation is approximately 15 minutes. You can answer the question on the basis of numbers, which are ranging from unsatisfied (1) to satisfied (5). First, a general question will be asked followed by the presentation of the solutions. Every solution is presented on one page.

General

1. I am located in:

X	The Library
	The Scientific Affairs department
	The Communications department

Goals and Strategy

During the interview, it was said that the goals and strategy of the department were not defined*. However, goals and strategies can provide structure and future perspectives to your department. Therefore, goals and strategies should be defined. In general, goals are defined as "What should be accomplished in a certain time period" and the strategy as "How the predefined goals can be accomplished". The goals and strategies can act as guidelines for your daily tasks.

2. How satisfied are you with the development of goals for your department?

1	2	3	4	5	NVT
			X		

3. How satisfied are you with the development of a strategy for your department?

			X		
--	--	--	---	--	--

4. Which mark would you give to the practice?

7

Additional comments regarding the development of goals and a strategy?

**Goals and strategy are defined, however, they were not updated regularly during the growth of the Company*

Rewards

According to the interviews, sharing of knowledge should be optimized. A reward can provide an incentive to sharing knowledge within the organization and your departments. Assuming that you or a colleagues have no time or get no stimulus to sharing knowledge, you will not share knowledge. By providing a reward, you can be compensated. This reward can be monetary (e.g. stocks and money), physical items (e.g. car and dinner) or an increase of social recognition (e.g. status and medals).

5. How satisfied are you with rewards?

6. How satisfied are you with a monetary reward?

7. How satisfied are you with a physical reward?

8. How satisfied are you with an increase in social recognition?

1	2	3	4	5	NVT
			X		
		X			
			X		
			X		

9. Which mark would you give to the KM practice?

8

Additional comments regarding the rewards?

Very difficult to measure the amount of knowledge sharing in a objective way

Investments

In the interview, it was acknowledge that there is a lack of external information sources. Investments can solve the problem. It allows the Library and the Communications department to access the databases and retrieves information regarding scientific information (e.g. articles) and the Company (e.g. media clipping and newswires). A second investment is needed to overcome the problem of copyright. At this moment, copyright obstructs information sharing. the Company has to pay a fee for every downloaded article. The communications department uses an expensive external PR organization to rewrite articles (only Dutch articles). A new employee could rewrite the articles or more money should become available to buy and share articles. I think a third investment is needed to gathering of information in a proper way from the medical library of the University of Leiden.

10. How satisfied are you with investments in external information sources?

1	2	3	4	5	NVT
				X	

11. How satisfied are you with investments to overcome the problems associated with copyright?

				X	
--	--	--	--	---	--

12. How satisfied are you with investments to overcome the problems of gathering information form the University of Leiden Library?

				X	
--	--	--	--	---	--

13. Which mark would you give to the KM practice?

9

Additional comments regarding the investments?

Investments in external sources also allows direct access of databases by the Company employees without interfering of the library

Social networks

During the interview, some participant identified that there is a lack of internal information and an island structure. Also, problems regarding to find and access information were acknowledged. Social networks enhance the interaction and communication between you and your colleague. To allow a social network to be successful, four criteria should be fulfilled. The first criterion is that you and your colleague should have time and be accessible. Secondly, you and your colleague should know each other's knowledge and, third, you and your colleague should be willing to engage in problem solving. The fourth criterion of social networks is the promotion of a degree of safety, which allows you and your colleague to learn and be creative. The social network allows you and your colleague to find and access each other and share information.

14. How satisfied are you with the creation of a social network?

1	2	3	4	5	NVT
			X		
			X		

15. How satisfied are you with more time to enhance social networks and knowledge sharing?

16. Which mark would you give to the KM practice?

8

Additional comments regarding social networks?

Complementary, all departments should invest in describing their activities on the intranet to allow colleagues to find people for their social network

Meeting

Some participants acknowledge a lack of communication with their supervisor, which obstructs the access of information. Regular meetings stimulate interaction and can improve the communication between you and your supervisor. This allows you to access information and knowledge.

	1	2	3	4	5	NVT
17. How satisfied are you with meetings?			X			

18. How regular would you like to have a meeting? 1-2x / month

19. Which mark would you give to the KM practice? 7

Additional comments regarding meetings?

Only meet when necessary. Just walk by regularly can sometimes also be sufficient.

Collaboration tool

During the meeting, a lack of feedback, a lack of internal information, island structures were identified as problem. A collaboration tool can provide communicate, cooperate, and coordinate knowledge and information. The collaboration tool enhances interaction between you and your colleague at similar and different locations and time. You can receive feedback via discussion forum from other facilities, departments and individuals, which will increase the effectiveness of the contribution. The Library can notify members of the organization regarding request of articles. The benefit of a discussion forum is that the information is stored and you can read the message at different times and places. The information is stored and made visible. Notification (e.g. RSS feeds) can inform you about new-posted messages and information. This will personalize your information. The Scientific Affairs department can act as knowledge broker. They can supervise and control the discussions as well as the information flows.

- 20. How satisfied are you with the collaboration tool?
- 21. How satisfied are you with feedback?
- 22. How satisfied are you with the discussion forum?
- 23. How satisfied are you with the notifications?
- 24. How satisfied are you with the knowledge broker?

1	2	3	4	5	NVT
			X		
			X		
			X		
			X		
			X		

- 25. Which mark would you give to the KM practice?

8

Additional comments regarding the collaboration tool?

It seems to be an excellent tool for an information rich company like the Company. However, in order to create a companywide support for this tool, it's absolutely necessary that it has a very user friendly interface. If not, people don't use it!

Document Management System (DMS)

According to some participants, there was a lack of a proper system. Information was scattered across different locations. The information was hard to update. A Document Management System (DMS) controls the information flow between you and another colleague. Different levels of authorization can be applied, which can or cannot restrict you and your colleague to access information and documents. A DMS controls and allows modification of one document at the time and tracks the modifications of the documents for you (e.g. audit trail). The documents can be labelled with information about the document (e.g. metadata), which allows you to search and retrieve the proper document in time. The documents and information are store in a single database and are organized in groups and folders. The DMS allows you to share general (e.g. articles, media clipping, ect) and confidential information.

26. Are you satisfied with the DMS?

27. Are you satisfied with the accessibility of documents?

1	2	3	4	5	NVT
		X			
		X			

28. Which mark would you give to the KM practice?

6

Additional comments regarding the DMS?

- *A DMS can be too restrictive to receive unstructured information*
- *To label documents, it's very fundamental to discuss if the labeling/ tagging is done automatically, by users themselves or by an indexer. If not, problems can persist*

Training of the systems

To prevent misunderstanding of the collaboration tool, the DMS and RSS feeds, training should be provided to you. Training increases your understanding of the KM practices and increase effectiveness of knowledge sharing (e.g. proper use).

29. How satisfied are you with training regarding the use of a system?

1	2	3	4	5	NVT
			X		

30. Which mark would you give to the KM practice?

7

Additional comments regarding the training?

RSS feeds

RSS feeds (Real Simple Syndication) allow you to personalize information flows. By using RSS feeds, you can gain information about competitors, WHO, US government and other external information sources. The information will be visualized. The RSS feeds will provide you with a notification, when information is updated and becomes available. This will save time.

31. How satisfied are you with RSS feeds as a solution for monitoring external information?

1	2	3	4	5	NVT
			X		

32. How satisfied are you with personalized information?

			X		
--	--	--	---	--	--

33. Which mark would you give to the KM practice?

8

Additional comments regarding RSS feeds?

Excellent tool for personalized external information!

Thank you for the cooperation.

Evaluation

Hello participant,

After we had an interview, I processed the interview and identified the problem of the three case studies (e.g. Library, Scientific Affairs and Communication). During the problem analysis, different as well as similar problems were identified within the departments and between participants. Afterwards, I performed an in-depth literature study and made a selection of KM solutions. Hopefully, the selected KM practices fit your wishes and the organizational culture. The goal of this evaluation is to determine your satisfaction. The duration of the evaluation is approximately 15 minutes. You can answer the question on the basis of numbers, which are ranging from unsatisfied (1) to satisfied (5). First, a general question will be asked followed by the presentation of the solutions. Every solution is presented on one page.

General

1. I am located in:

X	The Library
	The Scientific Affairs department
	The Communications department

Goals and Strategy

During the interview, it was said that the goals and strategy of the department were not defined. However, goals and strategies can provide structure and future perspectives to your department. Therefore, goals and strategies should be defined. In general, goals are defined as "What should be accomplished in a certain time period" and the strategy as "How the predefined goals can be accomplished". The goals and strategies can act as guidelines for your daily tasks.

2. How satisfied are you with the development of goals for your department?

1	2	3	4	5	NVT
	X				

3. How satisfied are you with the development of a strategy for your department?

			X		
--	--	--	---	--	--

4. Which mark would you give to the practice?

8

Additional comments regarding the development of goals and a strategy?

Rewards

According to the interviews, sharing of knowledge should be optimized. A reward can provide an incentive to sharing knowledge within the organization and your departments. Assuming that you or a colleagues have no time or get no stimulus to sharing knowledge, you will not share knowledge. By providing a reward, you can be compensated. This reward can be monetary (e.g. stocks and money), physical items (e.g. car and dinner) or an increase of social recognition (e.g. status and medals).

5. How satisfied are you with rewards?

6. How satisfied are you with a monetary reward?

7. How satisfied are you with a physical reward?

8. How satisfied are you with an increase in social recognition?

1	2	3	4	5	NVT
		X			
			X		
		X			
		X			

9. Which mark would you give to the KM practice?

7

Additional comments regarding the rewards?

Investments

In the interview, it was acknowledge that there is a lack of external information sources. Investments can solve the problem. It allows the Library and the Communications department to access the databases and retrieves information regarding scientific information (e.g. articles) and the Company (e.g. media clipping and newswires). A second investment is needed to overcome the problem of copyright. At this moment, copyright obstructs information sharing. The Company has to pay a fee for every downloaded article. The communications department uses an expensive external PR organization to rewrite articles (only Dutch articles). A new employee could rewrite the articles or more money should become available to buy and share articles. I think a third investment is needed to gathering of information in a proper way from the medical library of the University of Leiden.

10. How satisfied are you with investments in external information sources?

1	2	3	4	5	NVT
	X				

11. How satisfied are you with investments to overcome the problems associated with copyright?

	X				
--	---	--	--	--	--

12. How satisfied are you with investments to overcome the problems of gathering information form the University of Leiden Library?

	X				
--	---	--	--	--	--

13. Which mark would you give to the KM practice?

4

Additional comments regarding the investments?

Social networks

During the interview, some participant identified that there is a lack of internal information and an island structure. Also, problems regarding to find and access information were acknowledged. Social networks enhance the interaction and communication between you and your colleague. To allow a social network to be successful, four criteria should be fulfilled. The first criterion is that you and your colleague should have time and be accessible. Secondly, you and your colleague should know each other's knowledge and, third, you and your colleague should be willing to engage in problem solving. The fourth criterion of social networks is the promotion of a degree of safety, which allows you and your colleague to learn and be creative. The social network allows you and your colleague to find and access each other and share information.

14. How satisfied are you with the creation of a social network?

1	2	3	4	5	NVT
		X			
		X			

15. How satisfied are you with more time to enhance social networks and knowledge sharing?

16. Which mark would you give to the KM practice?

6

Additional comments regarding social networks?

Meeting

Some participants acknowledge a lack of communication with their supervisor, which obstructs the access of information. Regular meetings stimulate interaction and can improve the communication between you and your supervisor. This allows you to access information and knowledge.

	1	2	3	4	5	NVT
17. How satisfied are you with meetings?				X		

18. How regular would you like to have a meeting? 6 / year

19. Which mark would you give to the KM practice? 8

Additional comments regarding meetings?

Collaboration tool

During the meeting, a lack of feedback, a lack of internal information, island structures were identified as problem. A collaboration tool can provide communicate, cooperate, and coordinate knowledge and information. The collaboration tool enhances interaction between you and your colleague at similar and different locations and time. You can receive feedback via discussion forum from other facilities, departments and individuals, which will increase the effectiveness of the contribution. The Library can notify members of the organization regarding request of articles. The benefit of a discussion forum is that the information is stored and you can read the message at different times and places. The information is stored and made visible. Notification (e.g. RSS feeds) can inform you about new-posted messages and information. This will personalize your information. The Scientific Affairs department can act as knowledge broker. They can supervise and control the discussions as well as the information flows.

- 20. How satisfied are you with the collaboration tool?
- 21. How satisfied are you with feedback?
- 22. How satisfied are you with the discussion forum?
- 23. How satisfied are you with the notifications?
- 24. How satisfied are you with the knowledge broker?

1	2	3	4	5	NVT
			X		
			X		
		X			
			X		
			X		

- 25. Which mark would you give to the KM practice?

7,5

Additional comments regarding the collaboration tool?

Document Management System (DMS)

According to some participants, there was a lack of a proper system. Information was scattered across different locations. The information was hard to update. A Document Management System (DMS) controls the information flow between you and another colleague. Different levels of authorization can be applied, which can or cannot restrict you and your colleague to access information and documents. A DMS controls and allows modification of one document at the time and tracks the modifications of the documents for you (e.g. audit trail). The documents can be labelled with information about the document (e.g. metadata), which allows you to search and retrieve the proper document in time. The documents and information are store in a single database and are organized in groups and folders. The DMS allows you to share general (e.g. articles, media clipping, ect) and confidential information.

26. Are you satisfied with the DMS?

27. Are you satisfied with the accessibility of documents?

1	2	3	4	5	NVT
		X			
		X			

28. Which mark would you give to the KM practice?

7

Additional comments regarding the DMS?

Training of the systems

To prevent misunderstanding of the collaboration tool, the DMS and RSS feeds, training should be provided to you. Training increases your understanding of the KM practices and increase effectiveness of knowledge sharing (e.g. proper use).

29. How satisfied are you with training regarding the use of a system?

1	2	3	4	5	NVT
		X			

30. Which mark would you give to the KM practice?

7

Additional comments regarding the training?

RSS feeds

RSS feeds (Real Simple Syndication) allow you to personalize information flows. By using RSS feeds, you can gain information about competitors, WHO, US government and other external information sources. The information will be visualized. The RSS feeds will provide you with a notification, when information is updated and becomes available. This will save time.

31. How satisfied are you with RSS feeds as a solution for monitoring external information?

1	2	3	4	5	NVT
	X				

32. How satisfied are you with personalized information?

	X				
--	---	--	--	--	--

33. Which mark would you give to the KM practice?

4

Additional comments regarding RSS feeds?

Thank you for the cooperation.

Evaluation

Hello participant,

After we had an interview, I processed the interview and identified the problem of the three case studies (e.g. Library, Scientific Affairs and Communication). During the problem analysis, different as well as similar problems were identified within the departments and between participants. Afterwards, I performed an in-depth literature study and made a selection of KM solutions. Hopefully, the selected KM practices fit your wishes and the organizational culture. The goal of this evaluation is to determine your satisfaction. The duration of the evaluation is approximately 15 minutes. You can answer the question on the basis of numbers, which are ranging from unsatisfied (1) to satisfied (5). First, a general question will be asked followed by the presentation of the solutions. Every solution is presented on one page.

General

1. I am located in:

	The Library
	The Scientific Affairs department
X	The Communications department

Goals and Strategy

During the interview, it was said that the goals and strategy of the department were not defined. However, goals and strategies can provide structure and future perspectives to your department. Therefore, goals and strategies should be defined. In general, goals are defined as "What should be accomplished in a certain time period" and the strategy as "How the predefined goals can be accomplished". The goals and strategies can act as guidelines for your daily tasks.

2. How satisfied are you with the development of goals for your department?

1	2	3	4	5	NVT
		X			

3. How satisfied are you with the development of a strategy for your department?

		X			
--	--	---	--	--	--

4. Which mark would you give to the practice?

7

Additional comments regarding the development of goals and a strategy?

Rewards

According to the interviews, sharing of knowledge should be optimized. A reward can provide an incentive to sharing knowledge within the organization and your departments. Assuming that you or a colleagues have no time or get no stimulus to sharing knowledge, you will not share knowledge. By providing a reward, you can be compensated. This reward can be monetary (e.g. stocks and money), physical items (e.g. car and dinner) or an increase of social recognition (e.g. status and medals).

5. How satisfied are you with rewards?

6. How satisfied are you with a monetary reward?

7. How satisfied are you with a physical reward?

8. How satisfied are you with an increase in social recognition?

1	2	3	4	5	NVT
			X		
			X		
			X		
			X		

9. Which mark would you give to the KM practice?

6

Additional comments regarding the rewards?

Rewards are always good, but I don't know if it will solve the problem of sharing knowledge. We are depending on other departments to receive knowledge in the company. Rewards should be on their site.

Investments

In the interview, it was acknowledge that there is a lack of external information sources. Investments can solve the problem. It allows the Library and the Communications department to access the databases and retrieves information regarding scientific information (e.g. articles) and the Company (e.g. media clipping and newswires). A second investment is needed to overcome the problem of copyright. At this moment, copyright obstructs information sharing. the Company has to pay a fee for every downloaded article. The communications department uses an expensive external PR organization to rewrite articles (only Dutch articles). A new employee could rewrite the articles or more money should become available to buy and share articles. I think a third investment is needed to gathering of information in a proper way from the medical library of the University of Leiden.

10. How satisfied are you with investments in external information sources?

1	2	3	4	5	NVT
			X		

11. How satisfied are you with investments to overcome the problems associated with copyright?

			X		
--	--	--	---	--	--

12. How satisfied are you with investments to overcome the problems of gathering information form the University of Leiden Library?

		X			
--	--	---	--	--	--

13. Which mark would you give to the KM practice?

7

Additional comments regarding the investments?

Social networks

During the interview, some participant identified that there is a lack of internal information and an island structure. Also, problems regarding to find and access information were acknowledged. Social networks enhance the interaction and communication between you and your colleague. To allow a social network to be successful, four criteria should be fulfilled. The first criterion is that you and your colleague should have time and be accessible. Secondly, you and your colleague should know each other's knowledge and, third, you and your colleague should be willing to engage in problem solving. The fourth criterion of social networks is the promotion of a degree of safety, which allows you and your colleague to learn and be creative. The social network allows you and your colleague to find and access each other and share information.

14. How satisfied are you with the creation of a social network?

1	2	3	4	5	NVT
			X		
		X			

15. How satisfied are you with more time to enhance social networks and knowledge sharing?

16. Which mark would you give to the KM practice?

7

Additional comments regarding social networks?

Meeting

Some participants acknowledge a lack of communication with their supervisor, which obstructs the access of information. Regular meetings stimulate interaction and can improve the communication between you and your supervisor. This allows you to access information and knowledge.

	1	2	3	4	5	NVT
17. How satisfied are you with meetings?				X		

18. How regular would you like to have a meeting? 1/week

19. Which mark would you give to the KM practice? 8

Additional comments regarding meetings?

Collaboration tool

During the meeting, a lack of feedback, a lack of internal information, island structures were identified as problem. A collaboration tool can provide communicate, cooperate, and coordinate knowledge and information. The collaboration tool enhances interaction between you and your colleague at similar and different locations and time. You can receive feedback via discussion forum from other facilities, departments and individuals, which will increase the effectiveness of the contribution. The Library can notify members of the organization regarding request of articles. The benefit of a discussion forum is that the information is stored and you can read the message at different times and places. The information is stored and made visible. Notification (e.g. RSS feeds) can inform you about new-posted messages and information. This will personalize your information. The Scientific Affairs department can act as knowledge broker. They can supervise and control the discussions as well as the information flows.

- 20. How satisfied are you with the collaboration tool?
- 21. How satisfied are you with feedback?
- 22. How satisfied are you with the discussion forum?
- 23. How satisfied are you with the notifications?
- 24. How satisfied are you with the knowledge broker?

1	2	3	4	5	NVT
			X		
			X		
			X		
				X	
			X		

- 25. Which mark would you give to the KM practice?

8

Additional comments regarding the collaboration tool?

Please be aware that if this is an ongoing thing it can be very time consuming and you run the risk of an overload of information you don't need. Then it takes time again to filter it.

Document Management System (DMS)

According to some participants, there was a lack of a proper system. Information was scattered across different locations. The information was hard to update. A Document Management System (DMS) controls the information flow between you and another colleague. Different levels of authorization can be applied, which can or cannot restrict you and your colleague to access information and documents. A DMS controls and allows modification of one document at the time and tracks the modifications of the documents for you (e.g. audit trail). The documents can be labelled with information about the document (e.g. metadata), which allows you to search and retrieve the proper document in time. The documents and information are store in a single database and are organized in groups and folders. The DMS allows you to share general (e.g. articles, media clipping, ect) and confidential information.

26. Are you satisfied with the DMS?

27. Are you satisfied with the accessibility of documents?

28. Which mark would you give to the KM practice?

1	2	3	4	5	NVT
				X	
				X	

9

Additional comments regarding the DMS?

Training of the systems

To prevent misunderstanding of the collaboration tool, the DMS and RSS feeds, training should be provided to you. Training increases your understanding of the KM practices and increase effectiveness of knowledge sharing (e.g. proper use).

29. How satisfied are you with training regarding the use of a system?

1	2	3	4	5	NVT
				X	

30. Which mark would you give to the KM practice?

9

Additional comments regarding the training?

Good way to overcome problems mentioned before

RSS feeds

RSS feeds (Real Simple Syndication) allow you to personalize information flows. By using RSS feeds, you can gain information about competitors, WHO, US government and other external information sources. The information will be visualized. The RSS feeds will provide you with a notification, when information is updated and becomes available. This will save time.

31. How satisfied are you with RSS feeds as a solution for monitoring external information?

1	2	3	4	5	NVT
			X		

32. How satisfied are you with personalized information?

			X		
--	--	--	---	--	--

33. Which mark would you give to the KM practice?

8

Additional comments regarding RSS feeds?

Thank you for the cooperation.

Evaluation

Hello participant,

After we had an interview, I processed the interview and identified the problem of the three case studies (e.g. Library, Scientific Affairs and Communication). During the problem analysis, different as well as similar problems were identified within the departments and between participants. Afterwards, I performed an in-depth literature study and made a selection of KM solutions. Hopefully, the selected KM practices fit your wishes and the organizational culture. The goal of this evaluation is to determine your satisfaction. The duration of the evaluation is approximately 15 minutes. You can answer the question on the basis of numbers, which are ranging from unsatisfied (1) to satisfied (5). First, a general question will be asked followed by the presentation of the solutions. Every solution is presented on one page.

General

1. I am located in:

	The Library
X	The Scientific Affairs department
	The Communications department

Goals and Strategy

During the interview, it was said that the goals and strategy of the department were not defined. However, goals and strategies can provide structure and future perspectives to your department. Therefore, goals and strategies should be defined. In general, goals are defined as "What should be accomplished in a certain time period" and the strategy as "How the predefined goals can be accomplished". The goals and strategies can act as guidelines for your daily tasks.

2. How satisfied are you with the development of goals for your department?

1	2	3	4	5	NVT
X					

3. How satisfied are you with the development of a strategy for your department?

X					
---	--	--	--	--	--

4. Which mark would you give to the practice?

?

Additional comments regarding the development of goals and a strategy?

I have not seen these KM solutions

Rewards

According to the interviews, sharing of knowledge should be optimized. A reward can provide an incentive to sharing knowledge within the organization and your departments. Assuming that you or a colleagues have no time or get no stimulus to sharing knowledge, you will not share knowledge. By providing a reward, you can be compensated. This reward can be monetary (e.g. stocks and money), physical items (e.g. car and dinner) or an increase of social recognition (e.g. status and medals).

5. How satisfied are you with rewards?

6. How satisfied are you with a monetary reward?

7. How satisfied are you with a physical reward?

8. How satisfied are you with an increase in social recognition?

1	2	3	4	5	NVT
	X				
	X				
	X				
			X		

9. Which mark would you give to the KM practice?

?

Additional comments regarding the rewards?

Investments

In the interview, it was acknowledge that there is a lack of external information sources. Investments can solve the problem. It allows the Library and the Communications department to access the databases and retrieves information regarding scientific information (e.g. articles) and the Company (e.g. media clipping and newswires). A second investment is needed to overcome the problem of copyright. At this moment, copyright obstructs information sharing. the Company has to pay a fee for every downloaded article. The communications department uses an expensive external PR organization to rewrite articles (only Dutch articles). A new employee could rewrite the articles or more money should become available to buy and share articles. I think a third investment is needed to gathering of information in a proper way from the medical library of the University of Leiden.

10. How satisfied are you with investments in external information sources?

1	2	3	4	5	NVT

11. How satisfied are you with investments to overcome the problems associated with copyright?

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12. How satisfied are you with investments to overcome the problems of gathering information form the University of Leiden Library?

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13. Which mark would you give to the KM practice?

?

Additional comments regarding the investments?

Social networks

During the interview, some participant identified that there is a lack of internal information and an island structure. Also, problems regarding to find and access information were acknowledged. Social networks enhance the interaction and communication between you and your colleague. To allow a social network to be successful, four criteria should be fulfilled. The first criterion is that you and your colleague should have time and be accessible. Secondly, you and your colleague should know each other's knowledge and, third, you and your colleague should be willing to engage in problem solving. The fourth criterion of social networks is the promotion of a degree of safety, which allows you and your colleague to learn and be creative. The social network allows you and your colleague to find and access each other and share information.

14. How satisfied are you with the creation of a social network?

1	2	3	4	5	NVT
			X		
	X				

15. How satisfied are you with more time to enhance social networks and knowledge sharing?

16. Which mark would you give to the KM practice?

?

Additional comments regarding social networks?

Meeting

Some participants acknowledge a lack of communication with their supervisor, which obstructs the access of information. Regular meetings stimulate interaction and can improve the communication between you and your supervisor. This allows you to access information and knowledge.

	1	2	3	4	5	NVT
17. How satisfied are you with meetings?			X			

18. How regular would you like to have a meeting?	1/month
---	---------

19. Which mark would you give to the KM practice?	?
---	---

Additional comments regarding meetings?

Collaboration tool

During the meeting, a lack of feedback, a lack of internal information, island structures were identified as problem. A collaboration tool can provide communicate, cooperate, and coordinate knowledge and information. The collaboration tool enhances interaction between you and your colleague at similar and different locations and time. You can receive feedback via discussion forum from other facilities, departments and individuals, which will increase the effectiveness of the contribution. The Library can notify members of the organization regarding request of articles. The benefit of a discussion forum is that the information is stored and you can read the message at different times and places. The information is stored and made visible. Notification (e.g. RSS feeds) can inform you about new-posted messages and information. This will personalize your information. The Scientific Affairs department can act as knowledge broker. They can supervise and control the discussions as well as the information flows.

- 20. How satisfied are you with the collaboration tool?
- 21. How satisfied are you with feedback?
- 22. How satisfied are you with the discussion forum?
- 23. How satisfied are you with the notifications?
- 24. How satisfied are you with the knowledge broker?

1	2	3	4	5	NVT
X					
X					
X					

- 25. Which mark would you give to the KM practice?

?

Additional comments regarding the collaboration tool?

Document Management System (DMS)

According to some participants, there was a lack of a proper system. Information was scattered across different locations. The information was hard to update. A Document Management System (DMS) controls the information flow between you and another colleague. Different levels of authorization can be applied, which can or cannot restrict you and your colleague to access information and documents. A DMS controls and allows modification of one document at the time and tracks the modifications of the documents for you (e.g. audit trail). The documents can be labelled with information about the document (e.g. metadata), which allows you to search and retrieve the proper document in time. The documents and information are store in a single database and are organized in groups and folders. The DMS allows you to share general (e.g. articles, media clipping, ect) and confidential information.

26. Are you satisfied with the DMS?

27. Are you satisfied with the accessibility of documents?

28. Which mark would you give to the KM practice?

1	2	3	4	5	NVT

Additional comments regarding the DMS?

Training of the systems

To prevent misunderstanding of the collaboration tool, the DMS and RSS feeds, training should be provided to you. Training increases your understanding of the KM practices and increase effectiveness of knowledge sharing (e.g. proper use).

29. How satisfied are you with training regarding the use of a system?

1	2	3	4	5	NVT

30. Which mark would you give to the KM practice?

Additional comments regarding the training?

RSS feeds

RSS feeds (Real Simple Syndication) allow you to personalize information flows. By using RSS feeds, you can gain information about competitors, WHO, US government and other external information sources. The information will be visualized. The RSS feeds will provide you with a notification, when information is updated and becomes available. This will save time.

31. How satisfied are you with RSS feeds as a solution for monitoring external information?

1	2	3	4	5	NVT

32. How satisfied are you with personalized information?

--	--	--	--	--	--

33. Which mark would you give to the KM practice?

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Additional comments regarding RSS feeds?

Thank you for the cooperation.

Appendix C: Cultural study Jansen (2006)

The Company: The Growing Culture

Afstudeeropdracht Yvette Jansen

P&A 4

Samenvatting

The organisatie zit momenteel in een periode van grote veranderingen. Deze veranderingen hebben een invloed op de cultuur binnen de organisatie. Dit rapport geeft een advies met de acties die genomen kunnen worden om de gewenste cultuur te bereiken. De centrale vraag waar dit rapport omheen is gebouwd luidt:

“Wat is de gewenste organisatiecultuur en welke acties kan de organisatie Nederland ondernemen om tot een gewenste organisatiecultuur te komen?”

Organisatiecultuur is “de gemeenschappelijke waarden en normen van een organisatie en het daaruit voortvloeiende gedrag”.

Door middel van de OCAI-methode (Organizational Culture Assessment Instrument) heb ik de huidige en de gewenste cultuur bij de organisatie onderzocht. Uit dit onderzoek zijn de volgende cultuurprofielen naar voren gekomen:

De huidige cultuur bij de organisatie kan als volgt beschreven worden als erg dynamisch en creatief. De leiding van de organisatie is innovatief en ondernemend en bereidt om risico's te nemen. Er is weinig structuur en veel vrijheid voor medewerkers. Er is weinig top-down communicatie. Leidinggevend en stimuleren competitie tussen medewerkers, maar tegelijkertijd is er veel teamwork. Leden van de organisatie zijn ambitieus. Het bindmiddel van de organisatie is inzet bij experimenten, innovatie en ontwikkeling. Men wil uniek zijn en de beste in de markt. Winnen in de markt is een prioriteit. De strategie binnen de organisatie is gericht op het aanboren van nieuwe bronnen, het uitproberen van nieuwe dingen en het zoeken naar kansen. Op die manier wil men toonaangevend zijn in de markt. Succes betekent de beschikking hebben over nieuwe producten, en op die manier een prominente plaats in de markt weten te veroveren.

De gewenste cultuur bij de organisatie is dynamisch, flexibel en maar stabiel. De leiding van de organisatie is innovatief en ondernemend. Binnen de regels is er mogelijkheid tot het nemen van risico's. Er is openheid en duidelijkheid over de koers van de organisatie. Er is een duidelijke structuur met een heldere, beperkte set regels en voldoende vrijheid voor medewerkers. Medewerkers en leidinggevendenden zijn ambitieus en worden gestimuleerd tot ontwikkeling door middel van opleiding en begeleiding. Het bindmiddel van de organisatie bestaat uit betrokkenheid bij het product, en bij de innovatie en ontwikkeling hiervan.

De strategie bestaat uit het soepel laten verlopen van de organisatie en productie. Binnen de richtlijnen wordt er veel nadruk gelegd op het aanboren van nieuwe bronnen en het creëren van nieuwe kansen. Succes betekent de beschikking hebben over nieuwe producten, en op die manier een prominente plaats in de markt weten te veroveren. Dit wordt gefaciliteerd door heldere procedures en richtlijnen die zorgen voor een soepele, efficiënte en betrouwbare productie.

Uit het onderzoek is gebleken dat er opvallende discrepanties bestaan tussen medewerkers en leidinggevendenden. Over het algemeen wenst de groep medewerkers meer van de hiërarchische cultuur terug te zien in de organisatie, in de vorm van een heldere structuur, duidelijke voorschriften, procedures en regelgeving. Leidinggevendenden zijn echter meer gericht op de sterke adhocratische waarden binnen de organisatie, die gekenmerkt wordt door veel vrijheid, risicobereidheid en ondernemingsdrang. Overigens zijn beide groepen van mening dat de adhocratiecultuur de dominante cultuur moet blijven binnen de organisatie.

Tussen de huidige en de gewenste cultuur zijn een aantal discrepanties waar te nemen. Belangrijk is dat de adhocratiecultuur binnen de organisatie moet blijven bestaan, maar dat er een stap richting de hiërarchische cultuur genomen moet worden.

Het is van belang dat de adhocratie gehandhaafd blijft in het innovatieve gedeelte van de organisatie. Wel moet het management een minder adhoccratische opstelling aannemen. Er moeten minder risico's worden genomen en meer stabiliteit worden geboden. Mederwerkers hebben behoefte aan een heldere structuur, duidelijke voorschriften, procedures en regelgeving. Dit is zeker van belang voor de nieuwe productiefaciliteit, waar een sterke op hiërarchie gerichte cultuur is gewenst.

Op basis van de gegevens uit het onderzoek heb ik een aantal conclusies en aanbevelingen gekomen:

1. Binnen de organisatie is er behoefte naar *meer structuur, duidelijke voorschriften, procedures en regelgeving*, zodat de organisatie efficiënter en betrouwbaarder kan functioneren.
2. Er is noodzaak tot een *verandering van mentaliteit*. Een verandering in cultuur wordt alleen bewerkstelligd als ook de mensen zèlf veranderen.
3. Er moet meer openheid van zaken binnen de organisatie komen door een *heldere en regelmatige top-down communicatie*. Dit zorgt ervoor dat medewerkers betrokken blijven, en voorkomt dat zij voor onverwachte veranderingen komen te staan.
4. De huidige sterke *adhocratiecultuur moet afnemen*. Als het management meer doordacht en volgens strategie handelt, zullen medewerkers en aandeelhouders niet voor verassingen komen te staan.
5. De sterk adhoccratische *houding van de leidinggevenden* moet veranderen. In de gewenste cultuur is aandacht voor voorschriften, structuur en efficiëntie. Leidinggevenden moeten hiermee om kunnen gaan en naar sturen.

6. Van belang is de *implementatie van de veranderingen*. Een goede implementatie neemt twijfels en onzekerheden weg, en zorgt voor medewerking vanuit de organisatie.

Voor een uitwerking van details verwijs ik u naar de verschillende onderdelen van het rapport.

