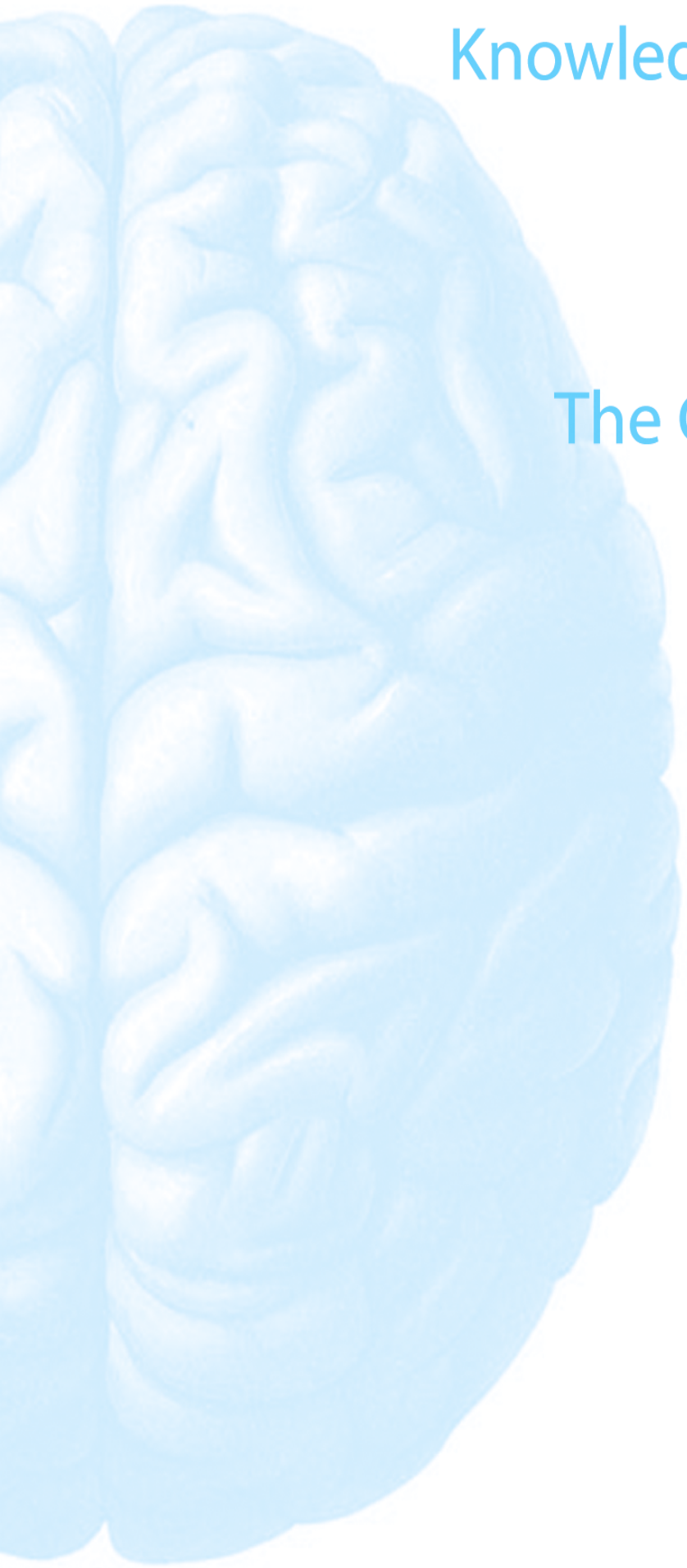

Knowledge Management and Retention at Organon:

The Case of Livial GVT

By Daisy Chong

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Master thesis of L.Y.D. Chong

University of Twente, Enschede
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Graduation committee

J.N. Hicks MIM
Ir. S.J. Maathuis

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Daisy Chong

Abstract

Organon is confronted with an aging workforce. The average age of the workforce is now 40.3 years, a large group of which are scheduled to retire. In addition, the high mobility of the current generation of workers is an additional threat for Organon, because in both cases, people with critical knowledge are leaving the company. Organon has adopted a number of knowledge management policies and programs to address this problem of knowledge loss.

To introduce Livial into the United States, Organon's management decided to set up a Global Venture Team (GVT), which is primarily responsible for the registration and launch of Livial in the United States. This team will initially be dissolved at the end of 2006. The majority of the team's effort and responsibilities will then be taken on by the local companies, global marketing and a continued support of departments like Regulatory Affairs and Drug Safety. Therefore, it is important to retain and transfer the crucial knowledge within this team to others.

The purpose of this research is to analyze the retention of crucial knowledge within the Livial GVT. Based on the nature of the crucial knowledge, retention methods suitable for the organization will be recommended.

The problem definition of this research is:

Using Livial as a case study, in what ways can Organon organize the knowledge so that crucial knowledge is preserved?

The first step of this research is a literature study that is needed in order to come to the evaluation criteria of knowledge retention methods. This literature review borrows primarily from theory and practice in the areas of knowledge management and organizational learning. From this review, a theoretical framework is derived. This framework is based on the concept of knowledge (as a resource) and knowing (the process of applying knowledge, in context) as two mutually constitutive approaches to knowledge.

The second step is data collection. Open interviews with the Human Resource (HR) managers and the knowledge manager are conducted to collect data about the knowledge management initiatives and the enabling factors within Organon. Semi structured interviews are conducted with members of the Livial GVT in order to give insight of the team and its processes. Company documents and publicly available information are also used.

The third step is to use the derived theoretical framework to analyze the knowledge management practices at Organon, and in particular for the Livial GVT. The purpose of this phase is to point out the strengths and weaknesses of their knowledge retention methods.

The result of this analysis indicates that despite a large number of policies and initiatives, knowledge management is not 'alive' within Organon, due primarily to a lack of 'knowledge-friendliness' of the organization culture. Based on information obtained during interviews, people do not feel compelled to practice knowledge management. They believe that the current database system is sufficient to retain knowledge. The outcome of the analysis points out that the company only focuses on the knowledge (as a resource) aspect and significantly underserves the knowing (or more process-oriented) aspects of knowledge. Recommendations are for the creation of additional support for the processual aspects of knowledge management, so that it becomes a living part of the culture of the organization and so that Organon can maximize the benefit of the efforts and investments already underway.

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1 Introduction

As described in the Management Summary, Organon, like all large organizations, faces the problem of the loss of crucial knowledge as their workforce ages, and more of their experienced, knowledgeable workers approach retirement. As discussed above, the loss of knowledge is a particularly important issue for the pharmaceutical industry, because of the knowledge-intensive nature of their work, and also due to the project-based work by which the drug discovery and development process is organized. At the launch of a drug, project teams that have worked together for several years are disbanded, and the potential for loss of not only technical knowledge, but also knowledge of social networks and relationships, is great. In this chapter, we begin with background information about Organon, and provide an overview of the drug discovery and development process, and the research organization within Organon. This will lead us to the formulation of the research problem area, the research objective and the research questions. This chapter concludes with the outline of the thesis.

1.1 Background

This research project was carried out on behalf of Organon N.V, one of the world's leading players in the pharmaceutical market: Organon is the human healthcare subsidiary of parent organization Akzo Nobel. We begin with a short introduction of Akzo Nobel and its activities, and then elaborate on one of the most important processes of any pharmaceutical company: the process of drug discovery & development. Finally, this section concludes with a description of Organon's research organization.

1.1.1 Akzo Nobel

Akzo Nobel is a global organization, based in the Netherlands, and with operating subsidiaries in more than 80 countries. The company employs approximately 61,500 people and conducts its activities in four segments; human health, animal health, coatings and chemicals. The business activities are subdivided into 13 business units. These thirteen business units are given a high degree of responsibility and autonomy, and cooperate in three divisions (see figure 1), each with its own managerial board.
The company divisions are: Coatings, Chemicals, and Pharmaceuticals. Sales in 2005 totaled EUR 13 billion, with Coatings accounting for EUR 5.5 billion, Chemicals for EUR 3.89 billion and Pharmaceuticals for EUR 3.52 billion.
Akzo Nobel is the world's leading coatings company with paints, services, and specialized equipment for the car repair and transportation market as its key products. The brands it manufactures include Sikkens, International, Crown, and Interpon.
Akzo Nobel is the world's leading salt specialist and produces additives found in everyday items such as ice cream, toothpaste, bakery goods, cosmetics, plastics, and glass. After reorganization in 2005, the Chemicals group now consists of five business units.
The third business area in which Akzo Nobel is active is Pharmaceuticals. The next paragraph will describe this business unit.

Pharmaceuticals

Akzo Nobel is active in two main areas of the pharmaceutical industry; human and animal healthcare. Its healthcare activities are represented by Organon, Intervet, Diosynth, and Nobilon. With 19.390 employees, Pharmaceuticals is Akzo Nobel's second largest division.
Intervet develops and produces veterinary medicines, and offers a full range of veterinary vaccines and pharmaceuticals for pets, livestock, poultry, and aquaculture. With global revenues of EUR 1,094 million in 2005, Intervet is the world's third largest animal health company, and the leading European business operating in the sector.

Other activities of the Akzo Nobel Pharma group are Diosynth and Nobilon. Diosynth and Organon have just been integrated into a single business unit. The integration of the two companies enables the Pharmaceutical group to combine and focus existing biotechnology competencies and reduce the complexity of logistics processes.
Although it is now formally part of Organon, Diosynth continues to trade independently under its own name as a technology-based manufacturer of active pharmaceutical ingredients for the third party market.
Nobilon was set up in 2002 to explore opportunities in the field of human vaccines. This business unit draws on the know-how and expertise of Organon, Intervet, and Diosynth. Akzo Nobel aims to harvest some of the synergies that exist between these businesses and diversify further into biotechnology.
In February 2006, Akzo Nobel announced its intention to start an initial public offering (IPO) for the pharmaceutical business units, under the name of Organon Biosciences. Organon BioSciences, the new pharmaceutical business, will consist of Organon, Intervet, and Nobilon. All three units will continue to function as independent business units with their existing names and logos.

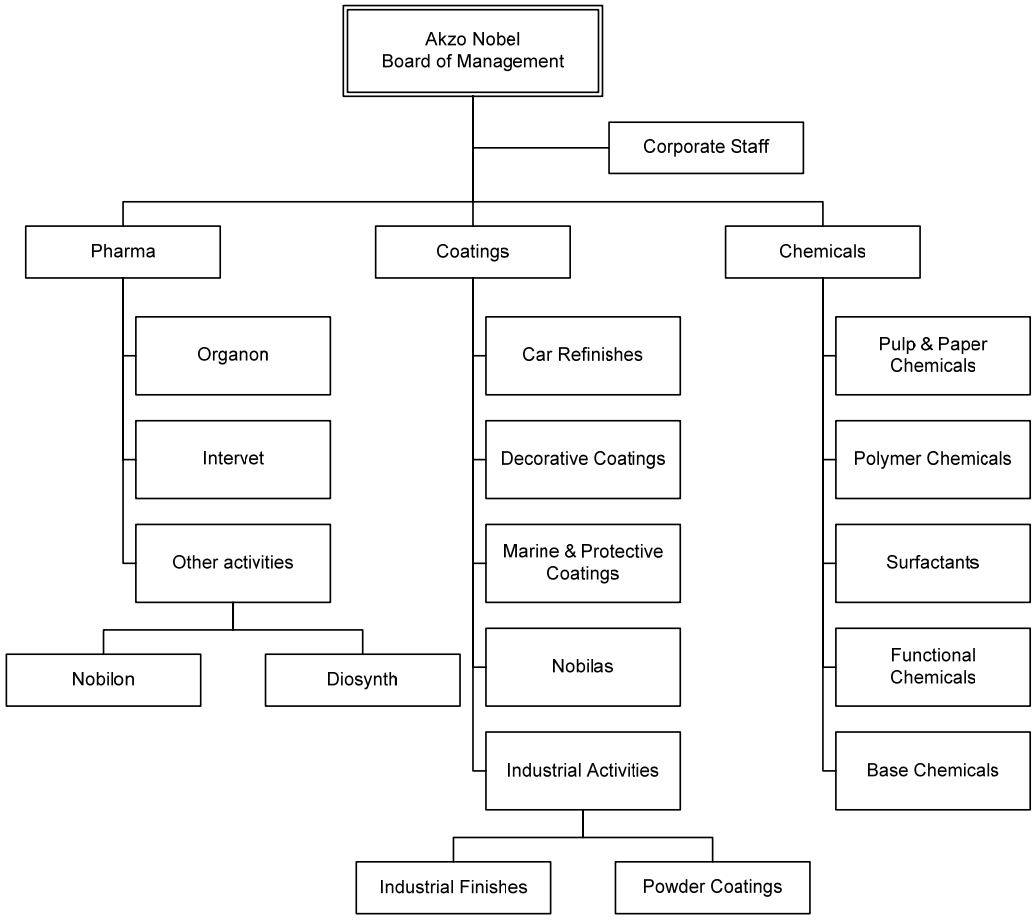


Figure 1 Organization chart

Organon
Organon was founded in 1923 by Dr. Saal van Zwanenberg, Professor Ernst Laqueur, and Dr. Jacques van Oss. The company, known then as Zwanenberg-Organon, was sited in Oss and a laboratory was established in Amsterdam. Organon's first product was insulin and a few years later the hormone estrogen was introduced. Estrogen became Organon’s leading product, and the company grew into one of the world’s largest producers of this female

hormone preparation. In 1969, Koninklijke Zwanenberg-Organon (KZO) merged with the fiber producer AKU to become AKZO, later Akzo Nobel.
As the human health care business unit of Akzo Nobel, Organon is dedicated to the development, manufacture and marketing of prescription drugs. Active in a number of key therapeutic areas, Organon is a leading player in gynecology (contraception, hormone replacement therapy, and fertility), mental health (antidepressants, antipsychotics) and anesthesia (muscle relaxants, pain relief).
Since its modest beginning, Organon has risen to be numbered in the ranks of the top 30 pharmaceutical companies worldwide. In order to bring new drugs to the market, Organon is highly committed to its global R&D activities (almost 20 percent of sales income is invested in R&D) and has a variety of alliances with other companies to strengthen its position in the selected markets. Organon's strategy in biotechnology is to develop and market new biological entities within areas of interest, including immunology and oncology.
Today, Organon has around 15.000 employees and has shared headquarters in Roseland, New Jersey, USA and Oss, The Netherlands. More than half of the Research- and Development (R&D) activities are based in Oss. Besides R&D, there are also departments like Pharmaceutical Operations and Regulatory Affairs. Almost half of Organon's production takes place in Oss. Furthermore, the company maintains a global network of production and R&D sites.
This study will focus on the Livial Global Venture Team (GVT). The Livial GVT is responsible for the registration and launch of the product Livial in the United States. Livial is a comprehensive treatment for the relief of climacteric symptoms and prevention of osteoporosis in postmenopausal women. For more information about global venture teams, see section Research organization.

1.1.2 Drug discovery & development

Drug research and development is a long and challenging process beginning with the very basics of scientific exploration and ending an average of twelve years later with a medicine that meets the health needs of patients and their doctors. This R&D process is also called the product pipeline (see figure 2).
Most compounds will not make it through the product pipeline as they fail to meet the stringent demands of safety and efficacy. For every drug that does reach the market, thousands are discarded along the way. Through the years, the probability of market introduction increases and the number of projects decreases.

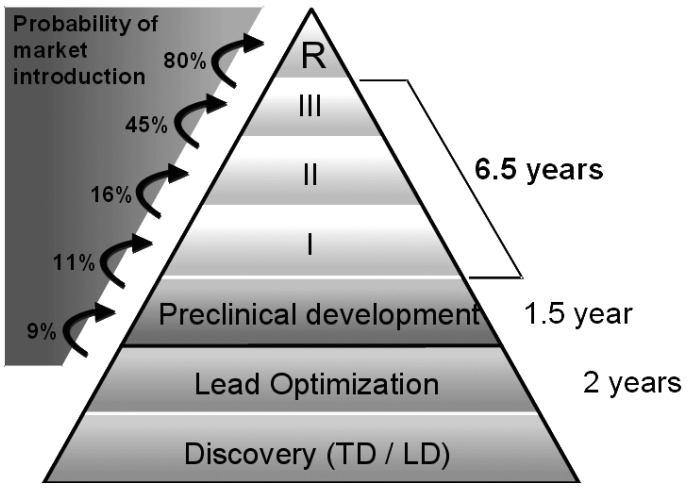


Figure 2 Product pipeline

The full process of R&D in the pharmaceutical industry has settled into a well-established sequence of four activities. Target discovery (TD), lead discovery (LD), and lead optimization are the three activities involved in the research phase of a medicine's life and are described in the drug discovery part. Development, the fourth activity, involves the early and later phase clinical trials needed to determine the medicine's efficacy and safety and prepare data for registration and marketing. This activity is explained in the drug development part.

Drug discovery

The first step, target discovery, aims to identify a biological drug target. Drugs usually act on either cellular or genetic chemicals in the body, known as targets, which are believed to be associated with disease. Once a target has been identified, chemists develop compounds that may interact with that particular target. Compounds are then identified that have various interactions with drug targets helpful in treatment of a specific disease.

Lead discovery is the second step within the research process, which may take up one to two years. A lead compound or substance is one that is believed to have potential to treat disease. Leads are sometimes developed as 'libraries' of individual molecules that possess properties needed in a new drug. Testing is then done on each of these molecules to confirm its effect on the drug target.

Lead optimization is the third and final step of the drug discovery process. During this phase, the properties of various lead compounds are compared and information provided to help the company select the compound or compounds with the greatest potential to be developed into safe and effective medicines. This phase can take the longest time, but at the end, optimization will have identified candidate compounds suitable for progress into development.

Drug development

Only when a candidate compound has met the selection criteria of lead optimization, it will enter development for more precise testing in preclinical and clinical studies. It is a move which will essentially take it from the laboratory to the clinic for use in human subjects and eventually, as a medicine with effective application, to the marketplace of patients and doctors.

The first phase in development is the preclinical and early clinical stage. Here, a full evaluation of the safety is made in a laboratory setup. When these tests have positive results, larger scale clinical trials are set up for final clinical development (phase I, II, III). Here extensive studies are done in which clinical measurement is done on human subjects.

The development phase provides vital information on the safety and efficacy of drug candidates. At the same time, financial and commercial information on their costs and cost-effectiveness will also be needed, particularly by registration authorities and healthcare providers. Such health economics factors are incorporated into the clinical development phase.

Phase III ends with an application to registration authorities, with a request for marketing authorization. The final phase of the drug development process is phase IV. After the launch of the new product, the aim is to identify any unforeseen side effects in the real clinical situation by means of post-marketing surveillance, and to investigate the drug's cost-effectiveness and real-life efficacy.

1.1.3 Research organization in Organon

To maintain its position Organon has to have a strong and deep product pipeline. The company's research program is set up to obtain targets, the so-called New Biological Entity (NBC) and New Chemical Entity (NCE) that are suitable for full development. Organon uses a global, project oriented research approach to attain this. Figure 3 depicts the research organization at Organon.

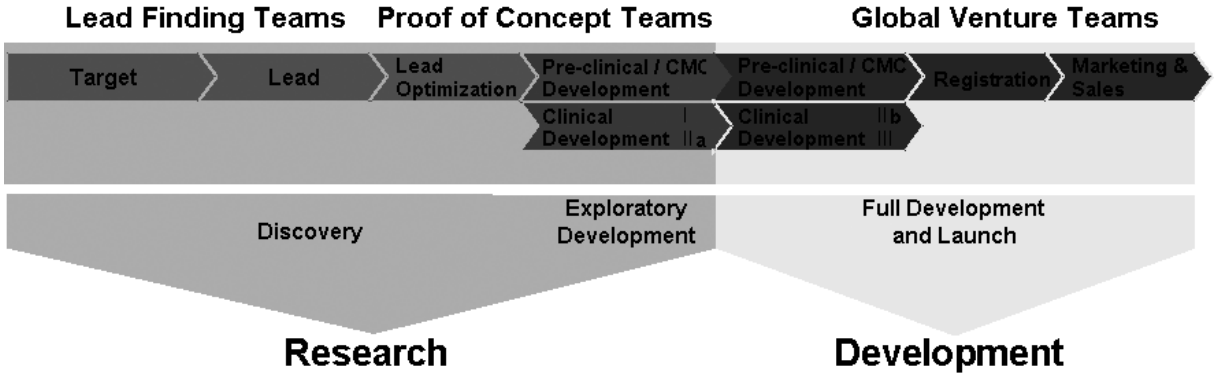


Figure 3 Research organization

The Lead Finding Team focuses on the target discovery (TD) and the lead discovery (LD). In this phase, lead compounds of suitable quality to progress to the Proof of Concept phase are identified.
After successful completion of the lead finding phase, the proof of concept phase is initiated. Here, suitable development candidates are selected and set up for preclinical and early clinical development (Phase I and II). The purpose of the proof of concept phase is selection of a development candidate during lead optimization and demonstration of suitability of the development projects for full development.
Global Venture Teams (GVTs), like the Livial GVT, are organized around compounds, which comply with criteria for proof of concept. These teams are responsible for end-phase development including clinical development and are composed of experts of various disciplines. Two years after the product launch the Global Venture Team will be dissolved and the majority of the team's effort and responsibilities will be taken on by the local companies, Global Marketing and a continued support of departments like Regulatory Affairs and Drug Safety. The Global Marketing department strategically deals with all clinical trials that are performed after the Global Venture Team stage.

1.2 Research Problem

In this section, we derive a research problem related to the danger of knowledge loss faced by Organon. To narrow down the scope of this problem, the project will focus on the Livial GVT as a case study.

1.2.1 Knowledge loss in Organon

The world's population is aging faster than ever (2007). As the post-World War II baby boom generation has begun to retire from the workforce, many experienced workers will retire in the next decade (De Long, 2004). Organizations are losing valuable experience and knowledge with their retirements. Moreover, due to an enormous decline of fertility in the 1960s and 1970s (van Ewijk, 2000), along with a steady increase in human life expectancy, the pool of highly skilled younger workers is shrinking while the number of aging and retired is increasing.

Obviously these demographics affect Organon as well. In addition, due to limited recruiting of younger workers in 2003 and 2004, the average age of the workforce increased to 40.3 year within 5 years (Organon, 2006). As the number of workers reaching retirement increases, so too does the loss of valuable experience and knowledge.
But knowledge loss occurs for reasons other than aging alone. Today, the younger generation of workers holds a different set of values and expectations than those held by their established employers. Young workers are more mobile and less loyal to their company than before. Faced with limited career opportunities inside their organizations, people tend to

look outside their organizations for additional career opportunities. This too results in the loss of not only knowledge, but also creativity and innovative ideas.
Yet another concern for Organon involves internal job transfers. Although the person stays within Organon, their knowledge becomes less accessible and in the long run it may even be lost. The loss is greater when succession planning is not thorough.

And finally, Organon, like other pharmaceutical manufacturers, faces the additional potential for knowledge loss from project teams at the launch of a drug and the disbanding of the project team.
Thus, to stay competitive in the future, Organon must address the issue of knowledge loss due to these numerous factors. In turn, knowledge management and succession planning are crucial to the company. Since this is a broad and complex problem, this research will focus on one specific case— the Livial Global Venture Team, as further described in the next section.

1.2.2 Case: Livial Global Venture Team

First, a short introduction of the product Livial will be given. Second, I will elaborate on the specific problem that the Livial GVT is facing.

Livial the product
Livial is a comprehensive treatment for the relief of climacteric symptoms and prevention of osteoporosis in postmenopausal women. Livial contains tibolone, a Selective Tissue Estrogenic Activity Regulator (STEAR), which regulates estrogenic activity in a tissue selective manner, resulting in desired estrogenic effects on tissues like brain, bone and vagina, while avoiding undesired estrogenic effects on endometrium and breast.
Livial was first introduced into the Dutch market in 1988. From then on, it gained registration successively in every country, with the exception of United States, Canada, and Japan. Well-accepted and popular in Europe, Livial presents Organon with an excellent opportunity in the United States, a market where both women and their physicians are looking for new treatments for postmenopausal symptoms.

Livial Global Venture Team
To introduce Livial into the United States, Organon's management set up a Global Venture Team (GVT), which is primarily responsible for the registration and launch of Livial in the United States.
Livial Global Venture Team is a team composed of people from different disciplines. Some of the Livial GVT members have also worked with Livial for several years before being formally assigned to the team. The concept behind the GVT is to combine knowledge of all members to create synergy. Functional departments from development, regulatory and commercial are working together with the GVT in sub teams to create an integrated strategy and execute the plans approved by the GVT.
Field research for this project was completed in the fall of 2006, before the team's dissolution at the end of 2006.

1.2.3 Research objective and research questions

The objective of this research is to analyze how the Livial GVT can retain crucial knowledge. Based on this analysis, retention methods suitable for the organization will be recommended.

Based on the research objective, the problem definition is defined as:

Using Livial as a case study, how can Organon ensure the preservation of crucial knowledge?

The central research questions are:

A) What are the criteria of a framework that can be used to evaluate the current knowledge retention methods at Organon?

1 What definition of knowledge can be found from the relevant academic literature?
2 What relevant classification schemes are there?
2 What is the process of knowing, and how does it differ from knowledge?
3 What are the enabling factors for knowledge retention?

B) To what extent do the knowledge retention methods currently in use at Organon and the Livial GVT meet the criteria of the theoretical framework?

1 What are the methods currently used to retain knowledge within Organon?
2 What are the enabling factors within Organon?
3 What kind of knowledge is crucial for the Livial GVT?
4 What are the methods currently used to retain knowledge within Livial GVT?

1.3 Thesis outline

The remainder of this thesis is organized as follows: The research approach is defined in chapter 2. Chapter 3 provides a review of the existing literature on knowledge management and organizational learning. The result of chapter 3 is a theoretical framework, which will be used to analyze the findings in chapter 4. Chapter 5 comprises the analysis of this research. Finally, Chapter 6 discusses the conclusion and recommendations of this thesis.

2 Research approach

As our objective is to analyze the retention of crucial knowledge within the Livial GVT, a single-case study method is chosen as an approach. A key strength of the case study method involves using multiple sources and techniques in the data gathering process. This case study involves an in-depth, cross-sectional examination of the Livial GVT.
This research uses a non-probability sampling technique, which can be distinguished as a purposive sampling approach. To obtain a holistic and in-depth understanding of the problem, both primary and secondary data will be used (see appendix 1 research material). The primary data consist of qualitative data captured by in depth-interviews. Documentary secondary data in written form is also used as a data source. Triangulation takes place by using multiple research objects and different data sources. The research approach is depicted in Figure 4.

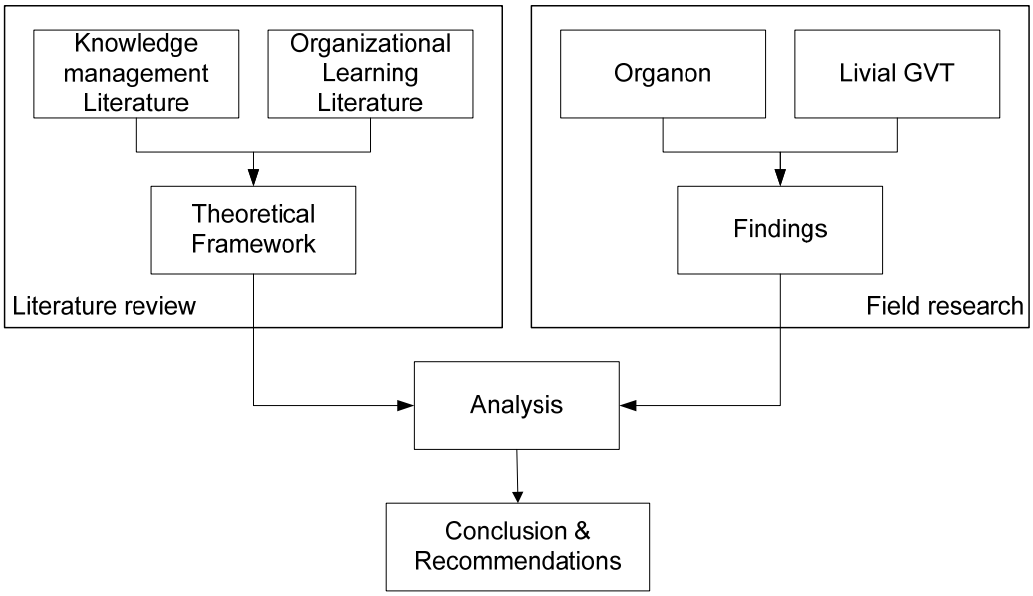


Figure 4 Research approach

The first step of this study involves the development of a framework for evaluating the knowledge retention methods currently in use at Organon. This in turn will require a review of published academic literature, primarily from the areas of knowledge management and organizational learning. The theoretical framework for use in the Analysis will be derived from this literature review.

The second step of this study is to collect data. Primarily, this will consist of in-depth interviews with the Human Resource (HR) managers and management involved with Organon's knowledge management initiatives. In addition, semi-structured interviews will be conducted with six members of the Livial GVT (for research instrument see appendix 2). The selection of these members is based on their function and knowledge. Information from websites and other documents are also collected.

Finally, we will apply the framework for an evaluation of their knowledge management practices, and identify strengths, weaknesses, and recommendations for improving the retention of crucial knowledge at Organon.

3 Literature review

In order to analyze the current situation within Organon, a theoretical framework of knowledge management is needed. In this chapter, the theoretical framework will be derived based on a review of relevant literature from the areas of knowledge management and organizational learning.

3.1 The growing importance of knowledge and knowledge management

To remain competitive in a global environment companies are forced to improve their effectiveness and efficiency. An unforeseen consequence of downsizing of the 1990's however, was the loss of some of the most knowledgeable and experienced workers. Since then, knowledge has been identified as an important contributor to overall competitiveness (Chiva & Alegre, 2005; Davenport & Prusak, 1998; Leonard & Swap, 2004; Spender, 1996). Increasingly, the survival and performance of an organization is seen to depend on the speed at which these organizations learn to develop knowledge-based competences that are both durable and adaptable (Stonehouse & Pemberton, 1999).

Innovations in information and communications technology (ICT) have enabled the development of infrastructure to support knowledge creation and network structures. However, an over-reliance on technology for knowledge management has also resulted in a number of expensive, yet failed initiatives (McDermott, 1999).

3.1.1 Knowledge

What is knowledge? A common definition, attributed to Plato, is that knowledge is "justified true belief". Knowledge can be defined as facts, information, and skills acquired by a person through experience or education (Murray, Simpson, & Weiner, 1989). The distinction between data, information, and knowledge in a kind of continuum has often been made in the literature. Data are seen as objective perceptible reflection of facts as name, address, residence, but also of procedures and tasks. Data have no implicit meaning and describe only partly of what have happened. Information results from interpretation and manipulation of data. The purpose of information is to change the attitude of the receiver in relation to something; it influences the perception and behavior of the receiver. Information is data which has been assigned a meaning. In organizations all kinds of data are modified to (management) information. For this research, we use the definition of knowledge from Davenport & Prusak (1998), pioneers in the field of knowledge management:

"Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms."

Most theories of knowledge management rest on a traditional understanding of the nature of knowledge (Cook & Brown, 1999), and treat knowledge as something one can possess, and also transfer or share with others. Cook and Brown (1999) refer to this treatment of knowledge as the "epistemology of possession".

3.1.2 Knowledge classifications

In the literature, there are many ways to categorize knowledge. Perhaps most well-known is the work of Polanyi (1983) and his categorization of tacit and explicit knowledge.

Tacit knowledge is knowledge which in most cases is applied but not made explicit. Tacit knowledge is personal and contextual, but yet may not be known to those who possess it. A lot of implicit knowledge is embedded in the skills of people, for example. Tacit knowledge is a tool or an aid to action, not part of action itself (Cook & Brown, 1999). Explicit knowledge is knowledge that can be articulated or codified and therefore relatively easy to communicate. Explicit knowledge is often in a form that can be easily transferred from one person to another. Examples of explicit knowledge can be found in textbooks, documents and software. Cook & Brown (1999) add group and individual distinction to Polanyi's classification to arrive at the classification shown in Figure 5.

According to Tsoukas and Vladimirou (2001), the distinction between individual and group knowledge is that individual knowledge is "the individual capability to draw distinctions, within a domain of action, based on appreciation of context or theory, or both." Group knowledge or organizational knowledge is "the capability members of an organization have developed to draw distinctions in the process of carrying out their work in particular concrete contexts, by enacting sets of generalizations whose application depends on historically evolved collective understandings and experiences"(Tsoukas & Vladimirou, 2001).

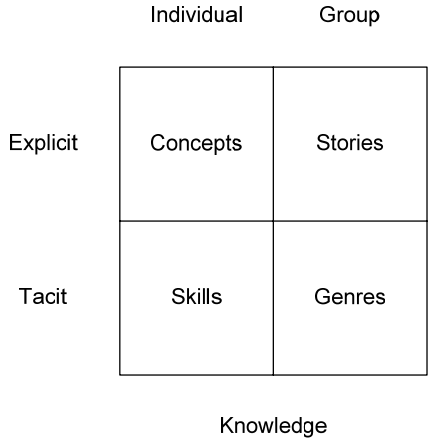


Figure 5 Knowledge categories

The upper left cell comprises knowledge which an individual can know, learn and express explicitly. One can think of math rules, equations, and concepts that are presented explicitly and are typically known and used by a math student. The lower left category contains forms of tacit knowledge possessed by individuals. Skills for utilizing the concepts and rules from the first category or a 'feel' for the proper use of a tool are from this category.

Knowledge contained in stories about famous successes or failures are examples of the upper right category. In this category knowledge is expressed explicitly and is used, expressed or transferred within a group. Organizational genres, in the lower right cell, are tacit knowledge shared by a group. This knowledge, used in the context of the group's ongoing 'real work', is established through negotiation in practice. Knowledge of a corporate culture would be an example of this kind of knowledge.

Cook & Brown (1999) believe that all four categories of knowledge are on equal standing and do change from one into another. Nonaka and Takeuchi (1995), in contrast, speak of a “knowledge spiral” whereby knowledge can be transformed from one type into another, as for example when someone demonstrates how to perform a certain task or operation. We discuss this further below.

3.1.3 Knowledge management

Along with the emphasis on knowledge has come the greater importance on knowledge management (KM), the processes whereby the knowledge asset is managed. The importance of KM was also aided by the ascendancy of the resource-based view of the firm (Barney, 1991) or RBV, which proposes that a form's strategy should be directly tied to its effective use of its resources, including the resource of knowledge.

The emphasis on knowledge as ‘knowledge assets’ has particularly led to the development of knowledge retention methods. People were convinced that information management tools and concepts are the solution to manage knowledge. As a result, significant investments have been made in Information & Communication Technology (ICT) solutions, such as electronic knowledge repositories (McDermott, 1999).

Unfortunately, many of these investments did not succeed, often due to user dissatisfaction, and the perception that the knowledge was too general and generic to be useful. Thus, despite the large investment in ICT solutions, these knowledge management methods could not fulfill its promise of retaining knowledge. Another and perhaps the most important cause of failure for knowledge management initiatives can be attributed to the treatment of knowledge as a static asset (McDermott, 1999), which leads us to the idea of knowing.

3.1.4 Knowing

While the traditional understanding of knowledge and classifications above are useful, they are all static, and thus cannot accommodate or explain how knowledge is actually used. According to the classifications above, for example, a bookshelf is quite knowledgeable, since it contains much knowledge. But unless we account for the process and activity required to use knowledge, its value is limited. The bookshelf analogy can be extended to the expensive and comprehensive yet idle knowledge repositories of failed KM initiatives.

Nonaka and Takeuchi (1995) were one of the first who acknowledge the dynamic aspect of knowledge creation. Their “knowledge spiral” is based on the assumption that the creation of knowledge is a continuous process of dynamic interactions between tacit and explicit knowledge. Tacit knowledge and explicit knowledge are in their eyes mutually complementary entities. However, they still prefer to see knowledge as an asset.

Cook & Brown (1999) go a bit further and suggest the need to move from an “epistemology of possession” to an “epistemology of practice”. They believe that “understanding of the epistemological dimension of individual and group action requires us to speak about both knowledge used in action and knowing as part of action”. In other words, knowing is name of the process whereby knowledge is applied in context (Lave & Wenger, 1991). Thus, when we ride a bicycle, we refer to

the knowledge that we have, based on experience, and apply that knowledge in an act of knowing—the act of riding the bicycle. When we first attempt to ride a bicycle, our knowledge is limited, and the process of knowing has little to draw on, sometimes with painful consequences. Yet as we gain experience, we draw on that experience and soon riding becomes 'second nature'. This also follows a pragmatist perspective (Rorty, 1981), where the difference between knowing and knowledge is that “knowing is literally something which we do”, while knowledge is something that is possessed. This perspective has large implications for the areas where knowledge and knowing interacts.

As mentioned above, and as found in the literature (e.g. McDermott, 1999) insufficient attention to the dynamic aspects of KM—the processes whereby KM is used, the policies that encourage or discourage the use of KM, such as performance measurements and/or incentives—all these have been identified as some of the most common reasons why KM initiatives fail. A common mistake is the assumption that workers in an organization whose culture does not encourage collaboration or the sharing of knowledge will suddenly start doing so, simply because infrastructure is made available. We will return to culture and other enablers below.

“Productive inquiry” as a pragmatist concept explains what knowing can do in using knowledge as a tool. It implies the active pursuit of a problem, puzzle, point of fascination, object of wonder, or the like, to seek an answer, solution, or resolution. Furthermore, it is the aspect of any activity where we are intentionally (consciously or subconsciously) seeking what we need, in order to do what we want to do. Using knowledge in productive inquiry to find a solution is knowing. Knowing on the other hand must respect the demands and constraints of knowledge. For example, returning to our bicycle example, when conditions change, such as when the road is wet, and we continue to draw on past knowledge, we may again fall if we draw from past knowledge—such as our experience on dry roads—that cannot be usefully applied in the current conditions—when roads are wet.

In this paper, we will treat knowledge and knowing not as two competing approaches to knowledge, but as mutually constitutive. Knowing requires the use of knowledge as a tool in the interaction with the world. Conversely, knowledge gives shape and discipline to knowing. Each reinforces, and produces, the other. Knowing without knowledge appears as unskilled performance. And knowledge without knowing is less useful, at least in social settings. The reciprocal interplay between knowledge and knowing is what Cook & Brown (1999) call “bridging epistemologies”—the epistemologies of possession and of practice. The linking of knowledge and knowing can generate new knowledge and new ways of knowing and is therefore mutually constitutive (see figure 6).

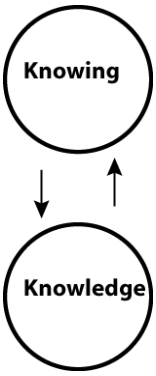


Figure 6 Reciprocal interplay between knowing and knowledge

3.2 Knowledge management enablers

Based on our literature review so far, and the need to move beyond, for example, the idea of KM as being primarily about the *storage* of information, we expand our discussion to include certain enablers of KM. We can define these enablers as: "Organizational mechanisms for intentionally developing and supporting knowledge in organizations" (Ichijo, von Krogh, & Nonaka, 1998). These enabling factors can stimulate knowledge creation and facilitate the sharing of knowledge in an organization (Stonehouse & Pemberton, 1999). Based on the literature review, the five most important knowledge management enablers are: organizational culture, people, strategy, structure, and technology.

3.2.1 Culture

Contrary to the plans of most early KM efforts, organizational culture is now recognized as perhaps the single most important factor for successful knowledge management (Chase, 1997; Davenport, De Long, & Beers, 1998; Gold, Malhotra, & Segars, 2001). Schein (1992) defines culture as the shared values, beliefs and practices of the people in the organization. The creation of a 'knowledge-friendly' culture to stimulate knowledge sharing can be seen as a 'pull' strategy used by the organization. A 'knowledge-friendly' culture consists of the following components: fit of the knowledge management type with the existing organizational culture, collaboration & trust, and learning. These components are derived from the literature review and will be elaborated in the following paragraphs.

Fit between knowledge management type and culture

First of all, it is of great importance that organizations tailor their KM approach to fit the culture (Davenport & Prusak, 1998), and style of the organization, rather than trying to change the culture or style to fit the knowledge management approach (McDermott & O'Dell, 2001). For successful implementation of knowledge management one should account for both the visible and invisible dimension of culture. With regard to the invisible dimension of culture, "sharing knowledge is tightly linked to a pre-existing core value of the organization" (McDermott & O'Dell, 2001).

Core values typically represent what people really consider important. In order to 'stay alive' and 'play the game' in the organization, people act upon these values. The key to a knowledge sharing culture is to build on existing core values. People are more willing to share knowledge and use the ideas of others initially because they believe in the core values, not because of knowledge sharing itself. As result, sharing

knowledge has now become a more natural step that requires less convincing than a direct change campaign.

The key points are:

- Tailor the approach, tools and structures of KM to match the organization
- Build on existing core values

Collaboration & trust

An environment where collaboration and trust is nourished positively affects knowledge creation through knowledge exchange (Nahapiet & Ghoshal, 1998; Von Krogh, 1998). This type of culture is fostered by reducing fear and increasing openness to other organization members.

Collaboration is an important aspect for sharing knowledge. In a team, members collaborate with each other to attain a certain goal. In order to do so, they will share knowledge and try to find the best way to attain the goal. During the collaboration, they do not only share knowledge, but they also create knowledge.

Trust is defined as the "willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer, Davis, & Schoorman, 1995). To be vulnerable implies that one has to take a risk. Trust is the willingness of the trustor to take a risk.

When trust is high, employees are more supportive of, or committed to organizational authorities, and more willing to participate in knowledge exchange (Brockner, Siegel, Daly, Martin, & Tyler, 1997; Nahapiet & Ghoshal, 1998). The employees' support for organizational authorities can be expressed in their satisfaction with the relationship with the authorities, their commitment to the organization, and the willingness to behave in ways that help to further the authorities' goals. Trust is critical in a cross-functional or inter-organizational team environment, considering a lack of trust can harm the knowledge creation (Hedlund, 1994; Jarvenpaa & Staples, 2000).

According to Szulanski (1996), lack of trust is one of the key barriers against knowledge exchange. 'Knowledge inhibitors' (Davenport & Prusak, 1998) are people who fear that sharing positive as well as negative knowledge will lead to layoffs. Although sharing information about mistakes or failures can be very valuable to the company and can prevent others from making the same error, most people fear that sharing this information will cost them their jobs. Others feel that sharing their knowledge and expertise will lower their value to the company and therefore endanger their position within the company.

The key points are:

- Collaboration stimulates knowledge sharing and knowledge creation
- Trust enhances employee supportiveness and commitment
- A lack of trust inhibits knowledge creation and knowledge sharing

Learning

According to American Heritage Dictionary, learning is the act, process, or experience of gaining knowledge or skill. In order to have successful knowledge creation organizations need to develop a learning culture (Quinn, Anderson, & Finkelstein, 2005) and support this by providing various learning means such as education, training and mentoring (Swan, Newell, & Robertson, 2000; Swap, Leonard, Shields, & Abrams, 2001).

To advance and enhance the competences of the company, the organizational culture must nurture an environment within which learning and knowledge are highly valued, and motivating individuals to constantly question existing practice (Stonehouse & Pemberton, 1999). Equally, employee empowerment is crucial to encouraging experiments with new approaches to business and the development of

knowledge skills. To reinforce a positive knowledge-orientated culture one should attract and hire the type of people that are bright, intellectually curious, willing and free to explore (Davenport & Prusak, 1998).

Importantly, knowing, as described above, is also learning, for when we apply knowledge in a context, we also gain feedback and learn, which also produces new knowledge we can draw from in the future (Lave & Wenger, 1991).

The key points are:
- Develop a learning culture
- Provide learning means, like education, training and mentoring
- Stimulate employee empowerment to encourage experiments with new approaches to business and the development of knowledge skills
- Attract and hire people that have a positive orientation to knowledge

3.2.2 People

People are the center of creating organizational knowledge. People not only share but also create knowledge. Managing people who are willing to create and share knowledge is therefore of great importance. A literature review shows the following aspects to be especially important: human resource policies, motivation, management support, and human networks.

Human resource policy

The Human Resource (HR) function can have a large influence on the organizational infrastructure for knowledge sharing. One of the central concerns of the HR function is the recruitment and retention of valued employees.

To align the HRM policy with the corporate strategy, the HR function has to know what kind of skills are needed for all essential professional and management roles in the organization (Carter & Scarbrough, 2001). Based on the need, new people with desirable skills will be recruited. Career development programs can also be used to develop new skills of the actual workforce.

As discussed earlier, the number of older, experienced workers is on the rise and companies face an increasing threat of knowledge drain. Anticipating the future knowledge crisis, the HR function should take measures to prevent crucial knowledge loss. One of the alternatives to slow this process down is a phased retirement program (De Long, 2004). In order to build long term workforce capabilities companies can use extensive career development and succession planning/ management programs to retain employees (Carter & Scarbrough, 2001).

Furthermore, the HR function needs to align the reward and recognition system to support knowledge sharing. This subject is closely related to employee motivation and will be further elaborated in the next section.

The key points are:
- Recruit new people with desirable skills
- Set up career development programs to develop new skills of the actual workforce
- Set up a phased retirement program
- Use career development and succession planning programs to build long term workforce capabilities
- Align the reward and recognition system to support knowledge sharing

Motivation

Knowledge is not shared easily because people do not interact with each other across role or functional boundaries (Szulanski, 1996). Employees must be motivated to create, share, and use knowledge (Davenport & Prusak, 1998). Reward and recognition is a way to make the importance of sharing knowledge visible.

People can be intrinsically as well as extrinsically motivated. Intrinsic motivation refers to motivation that comes from inside an individual. Intrinsically motivated people will perform certain activities for no reward other than the interest and enjoyment that accompanies them (Malone & Lepper, 1987). Extrinsically motivated employees on the other hand are people who are able to satisfy their needs indirectly; in particular through monetary compensation (Osterloh & Frey, 2000). It is a constant challenge to find new ways of motivation to increase participation in knowledge sharing systems. Intrinsic motivation enables creativity, while extrinsic motivation leads to stereotyped solutions (Amabile, 1996, 1998; Schwartz, 1990).
Motivational approaches for knowledge behaviors should be long term incentives integrated in the rest of the evaluation and compensation structure (Davenport & Prusak, 1998). In some companies, hoarding knowledge and failing to build on the ideas of others have visible and sometimes serious career consequences. A knowledge oriented culture has influence in the intrinsic motivation of the employee.

The key points are:

- Motivational approaches for knowledge behaviors should be long term incentives integrated in the evaluation and compensation structure

Management support

Senior management support is very essential to any change programs, including knowledge management programs (Davenport & Prusak, 1998). McDermott & O'Dell (2001) noticed that unambiguous support from direct managers and peers is an important enabler of knowledge sharing. By using management support to stimulate knowledge sharing, a company is applying a 'push' strategy to implement knowledge management projects. Strong support from executives is critical for transformation-oriented knowledge projects, but less necessary in efforts to use knowledge for improving individual functions or processes.
The senior management can use different methods to exert pressure to share knowledge. First of all, the management can use messages to the organization to emphasize that knowledge management and organizational learning are critical to the organization's success. The management can also provide funding and other resources for infrastructure. By clarifying what types of knowledge are most important to the company, it gives direction to its employees (Davenport & Prusak, 1998).

The key points are:

- Unambiguous support from direct managers and peers enables knowledge sharing
- Use messages to the organization to emphasize knowledge management
- Provide funding and other resources for infrastructure

Human networks

Nowadays, work has become more complex and interdependent; to accomplish their tasks individuals rely heavily on both co workers and external parties (Parise, Cross, & Davenport, 2006). Within a company, people use informal human networks to find who knows what, or to get help and advice (McDermott & O'Dell, 2001). Some of the human networks are merely social, while many form around sharing the knowledge people need to get their work done. Members of these informal networks trust each other and feel obliged to share information and insights with each other. Furthermore,

individuals often form strong personal relationships with their peers and feel appreciated by them (McDermott, 1999).
Knowledge retention approaches often focus on an individual's knowledge independent of the network of relationships needed to do the job. When employees leave the company they depart with more than what they know; they also leave with critical knowledge about who they know. This is especially important for Organon. The departure of key people can significantly affect the relationship structure and consequent functioning of an organization (Parise et al., 2006).
Community of practice (Lave & Wenger, 1991) is an example of a legitimated network that already exists; this kind of networks tries to enhance their ability to maintain expertise about topics important to the company. To preserve the organic character of natural networks, most companies try to keep the informal, self governing character of them (McDermott & O'Dell, 2001). Here, the focus of the formal funded networks is driven by people's interest, and the networks' size is determined by the urgency of its topic.
Human networks are one of the means for both creating and sharing knowledge (Lave & Wenger, 1991). It is highly recommended to enhance the existing networks by building a sharing culture and enabling them with tools, resources and legitimization (McDermott & O'Dell, 2001). By approaching the organization as a collection of networks, people, their roles, their relationships, and the knowledge they possess in accomplishing their jobs, can be identified. To keep a potential knowledge loss from becoming a crisis, the organization can use this information to take the actions necessary (Parise et al., 2006).

The key points are:

- Preserve the organic character of legitimated network, such as community of practices
- Enhance the existing informal networks by building a sharing culture and enabling them with tools, resources and legitimization

3.2.3 Strategy

One reason why knowledge management programs fail is a lack of a clear connection with a business goal (McDermott & O'Dell, 2001). Successful implementation of knowledge management initiatives characterizes itself by the visible connection between sharing knowledge and the business (McDermott & O'Dell, 2001).
First, the link between business and sharing knowledge can be made by integrating sharing knowledge into the business strategy. Sharing knowledge is then visibly approved and supported by senior management.
Another way is to let sharing knowledge piggyback on to another key business initiative. Progress toward the solution of a large-scale or specific business problem is the main measure of its value. It is also possible to approach sharing knowledge in a low-key manner. Embedded in a company's way of doing business, sharing knowledge is hardly seen as a separate activity (McDermott & O'Dell, 2001).

The key points are:

- Integrate sharing knowledge into the business strategy
- Let knowledge sharing piggyback on to other key business initiatives
- Embed knowledge sharing in a company's way of doing business

3.2.4 Structure

Organizational structure also has an important impact on the success or failure of KM initiatives. Centralization and formalization are the key aspects that determine the organizational structure (Lee & Choi, 2003). Centralization concerns the locus of decision authority and control within an organization (Caruana, Morris, & Vella, 1998; Ein-Dor & Segev, 1982). The concentration of decision-making authority reduces creative solutions, because different organization levels are making it harder to create a culture that supports the creation of knowledge, its diffusion, co-ordination and control (Lee & Choi, 2003; Stonehouse & Pemberton, 1999). Furthermore, centralized structure may hinder interdepartmental communication and the distortion of ideas and knowledge due to time-consuming communication channels (Bennett & Gabriel, 1999; Stonehouse & Pemberton, 1999; Woodman, Sawyer, & Griffin, 1993). According to Starbuck (1992), Stonehouse & Pemberton (1999), decreased centralization in the form of locus of authority leads to an increase of knowledge creation.

Formalization is the degree to which decisions and working relationships are determined by formal rules, standard policies, and procedures (Holsapple & Joshi, 2001). Although the assumption is that knowledge creation requires flexibility and less emphasis on work rules (Ichijo et al., 1998), Lee & Choi (2003) show that there is no significant relationship between formalization and knowledge creation.

Based on the above discussion, for example, when an organization consists of highly autonomous business units, it is unlikely that a centrally directed, top down-approach at the corporate level would be supported.

Building an organizational infrastructure for knowledge management is a challenge to put in place, as it requires new roles and organizational groups (Davenport & Prusak, 1998). These roles can vary from chief knowledge officers to knowledge project managers to knowledge reporters, editors, and knowledge network facilitators. Despite the fact that these new roles and structures are expensive, it means that any new project can take advantage of them for support, and lower startup time and costs (Davenport, De Long, & Beers, 1997).

Another difficulty is how to build an organizational structure that strikes a balance between specialized expert knowledge vs. holistic organizational knowledge (Stonehouse & Pemberton, 1999). Holistic organizational knowledge is the integration of expert knowledge from different specialties. Working in functional groups can ensure that experts interact, exchange ideas and develop new specialist knowledge, while working in cross-functional groups can stimulate the creation of organizational knowledge.

The key points are:

- Centralization hinders interdepartmental communication and the distortion of ideas and knowledge
- Decreased centralization leads to increase of knowledge creation
- Build an organizational infrastructure for knowledge management
- Organization structure supports the acquisition of expert knowledge and the creation of holistic organizational knowledge

3.2.5 Technology

Technology is the final enabler in our evaluation framework. Developments in technology, and especially those in information and communications technology (ICT), have played a crucial role in providing the infrastructure needed to support network structures and knowledge creation within companies (Gold et al., 2001; Stonehouse & Pemberton, 1999). Information technology (IT) is widely applied to

connect people with reusable codified knowledge, and it facilitates communication to create new knowledge (Lee & Choi, 2003).
Many researchers have discovered that IT is a vital element for knowledge creation (Davenport & Prusak, 1998; Gupta & Govindarajan, 2000). They assume that the support of IT is crucial for initiating and carrying out knowledge management. Lee & Choi (2003) and our earlier discussion of the dynamic processes of knowing, as well as the number of failed initiatives identified by McDermott (1999) and others, show that simply improving the IT infrastructure does not imply a competitive advantage for knowledge creation.
Another critical issue for knowledge management projects is finding the right balance of knowledge structure versus fluidity (Davenport & Prusak, 1998). Knowledge is naturally fluid and closely linked to the people who hold it. Therefore, its categories and meanings change frequently. On the other hand, if a knowledge repository has no structure, it is too difficult to extract knowledge from it. In practice, this involves the categories by which knowledge repositories are organized. Ideally, the structure of the knowledge accurately represents the pattern of use. The organization should be prepared to redefine its knowledge base frequently, and should design database under this assumption, so that changes are not overly difficult or cost prohibitive.
Also, knowledge projects supported by a broad technical infrastructure have more chance to succeed (Davenport & Prusak, 1998). The technology infrastructure for knowledge management projects can be improved by a uniform set of technologies for desktop computing and communications.

The key points are:

- Provide the infrastructure needed to support network structures and knowledge creation
- The knowledge structure always reflects the pattern of use
- Build a broad technical infrastructure

3.3 Theoretical framework

Based on the discussion of knowledge and knowing, as well as the enablers, we now derive our theoretical framework, shown below in Figure 7.

To emphasize the importance of the mutually constitutive interaction of knowledge and knowing, this reciprocal interplay is put as the centre of the framework. The arrows represent the reciprocity of these two concepts. Knowledge enables knowing, and knowing produces new knowledge. The more knowledge we have to draw from, the more effective knowing becomes. Effective structuring of the knowledge, patterned closely around the activities of work itself, further increases the effectiveness, and also the precision of knowing.

This reciprocal interplay is enabled by the five enabling factors of knowledge management. It is important to note that the interplay of knowledge and knowing occurs *within* a kind of ‘protected space’ created by the enabling factors. Likewise, when one or more of these factors are missing, the opportunities for knowing are reduced. And when knowing does not occur, knowledge is neither used, nor produced.
Looking at the scope of infrastructure, investment and activity represented by the framework, the true challenge of successfully carrying off a KM program is made apparent. It is also easier to understand why the simple provision of a knowledge repository—as was the case with many early KM initiatives—was bound to fail.

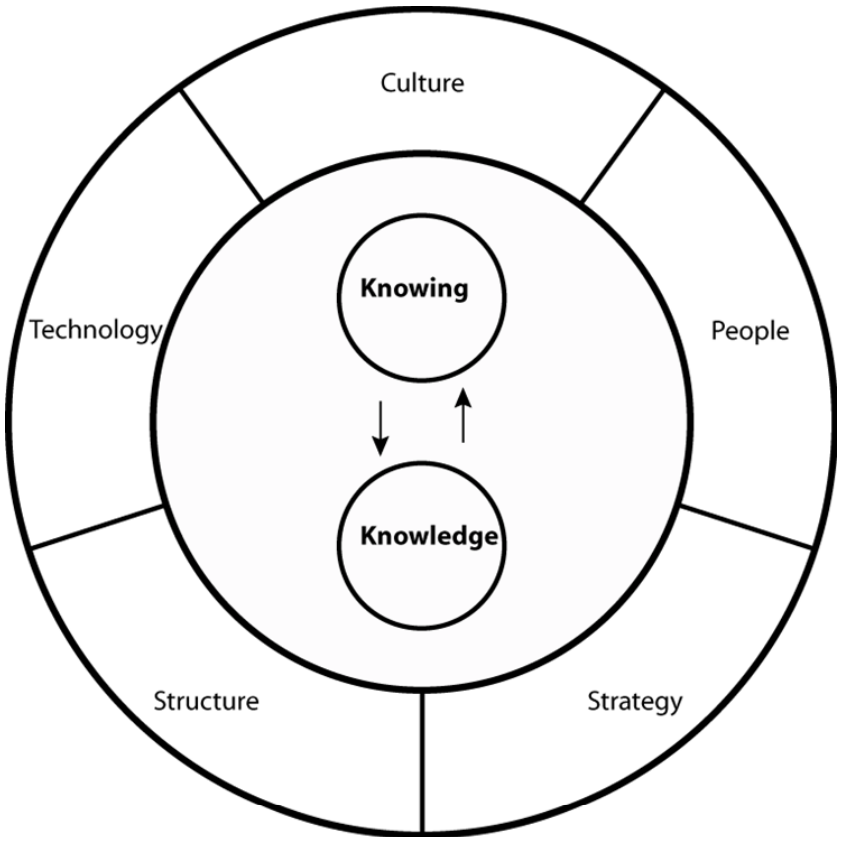


Figure 7 Theoretical framework

4 Findings

Chapter 4 starts with a description of the knowledge management practices in Organon. Furthermore, I will describe different aspects which have an impact on the implementation of knowledge management. This chapter will be concluded with a description of the case study.
The findings consist primarily of information elicited from interviews, company documents and Organon's intranet.

4.1 Knowledge management in Organon

First the function of the knowledge manager will be described. Furthermore, I will explain the KM initiatives of Organon. In this report, words such as instrument and tool are also used to define KM initiatives. Finally, I will elaborate on the subject of training and education. Most of the information is elicited from interviews with the knowledge manager and the Global Learning Center manager. Also information from intranet is used to describe these subjects.

4.1.1 Knowledge manager

To enhance knowledge management, Organon has appointed a knowledge manager. The person who holds the current position of knowledge manager is also the R&D and medical curriculum director. In this section, he will be referred to as the knowledge manager.
The knowledge manager is responsible for the planning and implementation of Knowledge Management initiatives (KM initiatives) throughout the company. An important responsibility of the knowledge manager is to establish standards and processes for knowledge sharing initiatives, to reduce costs and effort involved, and also the amount of trial and error, so that KM initiatives can become more efficient and effective.
Furthermore, the knowledge manager promotes knowledge sharing within the company. Knowledge management is always a topic on his agenda during his visits at the foreign plants. He creates awareness for knowledge management by spreading success stories about the initiatives for managing knowledge. The knowledge manager stimulates other departments to practice knowledge management, although the individual departments retain control over whether particular KM initiatives are adopted. In most cases, KM instruments are adapted to meet the local needs.
The knowledge manager states that his work is to keep the KM initiatives focused on business needs. When various departments or top management encounter a problem which can be solved with knowledge management, the knowledge manager tries to solve this with existing KM instruments or in some cases, develop new instrument or initiatives. The knowledge manager acts as a facilitator when existing KM initiatives can be applied. The knowledge map is the instrument which is developed to answer a specific business need. This KM instrument will be further elaborated in the section KM initiatives.
During the interview, the knowledge manager finds that despite his effort to raise the priority of bringing knowledge management among the top management, this effect has been limited. Thus, throughout Organon practice of knowledge management takes place on a voluntary basis.
According to the knowledge manager the most difficult part is not the implementation of new KM initiatives, but their utilization and maintenance. The knowledge manager has noticed that existing KM instruments are not adopted and used during day-to-day operation, but only when there is an immediate and pressing need to address a certain business problem. Since Organon management or employees do not view

this situation as a problem or an immediate business need, KM instruments in general suffer from low utilization.

4.1.2 Knowledge management initiatives

In this section the following knowledge management initiatives (KM initiatives) will be explained: Cheops, communities of practice, communities of interest, knowledge map, lessons learned, and mentoring.

Cheops

Cheops is a KM instrument developed by Akzo Nobel in the late nineties. It is an electronic yellow-page directory containing names and competency profiles of company experts. Cheops is designed with at that time available technology and vision in mind. The purpose of this initiative is to help employees to find each other by searching on personal data and expertise and enable them to ask questions about any expertise. It also increases the networking capabilities of new employees.

Employees can make their own profile by entering their personal data, their expertise, categories, and they can even add their personal page. As part of Akzo Nobel, members of Organon have access to Cheops. This KM instrument can be accessed through various parts of the intranet.

Despite the large investment in Cheops, a lot of people still do not have their own profile. The knowledge manager considers the limitation of the software to be the main raison; Cheops does not allow the user to describe his expertise accurately. As success of KM instruments is determined by the user friendliness and ease of application, Cheops does not meet the expectations of the user.

Another problem is that expertise recorded in personal profiles does not correspond well with the expertise of the users, because, for example, some people do not consider themselves as an expert in a certain field, while some may overestimate their own level of expertise.

Although Cheops is an initiative of Akzo Nobel, Organon has the largest number of profiles. At the moment, 1800 employees have a profile in Cheops. Around 400 people have a complete profile; the rest of the group has only entered basic personal data.

Cheops is very well introduced in Organon's R&D sector. The use of Cheops as a people finder has led to several success stories. Improvement of the intranet has also a positive influence on Cheops. People are now more aware of the benefits of this KM instrument. Yet, the number of people who use Cheops is still small. All in all, the knowledge manager sees Cheops as a semi success.

To integrate Cheops more in the daily work process, the knowledge manager has suggested adding few questions to the Personal Development Dialogue (PDD). These questions are:

- Do you have a profile in Cheops?
- Have you used Cheops to find knowledge?
- Have you been asked to share knowledge

These questions are useful to create awareness, and also give insight in what the experiences of people are. To keep the PDD simple, this idea is rejected by the local human resource department.

Communities of practice

A community of practice (CoP) is a group of individuals with similar work responsibilities but who are not part of a formally constituted team. The communities are set up to meet certain business needs. They focus on topics which are important to Organon and its members.

Resources for a CoP are made available by the sponsor of the concerning business need. To make sure members can easily contribute and access the community's knowledge and practices, IT support is provided to the CoPs. Everyone who is interested in a certain topic can join the CoP in question. Organon also allows its employees to make time for their participation.
In every CoP there is a core of participants who provide intellectual and social leadership. The champion is the person who manages the community, communicates with management, and does administrative tasks to keep the group moving. People are appointed champions because of their personal network, or their relationship with management.
CoPs are informal networks where members are not financially rewarded for their participation. Company congresses and other activities are set up by the communities to strengthen ties within the informal network. CoP participation is not limited to employees of Organon's site in Oss, it is also supported worldwide. Furthermore, the company stimulates the groups to expand their population with external members.

Communities of interest
Communities of interest (CoIs) are interest groups whose members share common interests which are not related to their everyday work. Although these communities are not driven by Organon's business needs, the company supports these communities by giving them incidental resources. This implies that some members of the community are allowed to visit congresses which are in the interests of the CoI. The past has demonstrated that it is also possible that a community of interest becomes a community of practice.

Knowledge map
Facing the problem of finding the right person for a certain position, Organon has chosen succession management as a way to solve this problem. The knowledge map is an initiative coming forth from a case in the R&D sector.
One department from the R&D sector was confronted with a succession problem. The departure of two employees led to the problem of finding the right people for these positions in time. Although one departure was known beforehand, the other was unannounced.
The intention is to develop a KM instrument to map actual knowledge. To assess the risk of employee departure, the following questions are crucial:

- What are the core business activities?
- Who are the knowledge carriers?
- Where can you find these knowledge carriers?
- How long does it take to replace the actual knowledge?

The knowledge map is a simple excel sheet consisting of the attributes: core business activities and people in the department. Every core business activity can be divided in different knowledge levels, such as trainee, advanced, master, and professional. By assessing every one's level of expertise in certain business activities, knowledge within a department can be mapped.
This KM instrument has changed the succession policy. In the past, a successor is sought just to fill the vacancy. In the new situation, a person leaves and the actual knowledge in the department will be evaluated. Based on the weaknesses of the knowledge base, the right people are recruited entering the training phase. Eventually, they will fill the knowledge gap. It is a strategic way to retain knowledge and experience. The department manager is responsible for the carrying out of the succession.
The knowledge map is only implemented in the R&D sector. The knowledge manager has promoted the knowledge map to ten departments; six to seven departments have actually implemented the instrument. Only two departments are

using the knowledge map periodically. The department managers use this instrument twice per year to evaluate the actual knowledge.

Lessons learned

Since 2004, Organon has started the initiative Lessons Learned. Sponsored by David Nicholson, the head of the Research & Development (R&D) department, the initiative is developed for the R&D sector of Organon. Lesson learned has three objectives. The first objective is sharing experiences with coworkers on the short term. By documenting lessons learned, experience gained at one project can be transferred to other projects.

The second objective is project evaluation. Once the lessons learned are created, a follow up with advice and recommendations from colleagues and management can take place. The provided feedback then can result in process improvement.

The last objective is to store valuable knowledge captured in lessons learned on the long term. Making use of the created lessons learned can prevent the recurrence of mistakes from the past.

Organon has done research on lessons learned and developed a template for this KM initiative. The template provides the user a standard on the utilization of lessons learned during project executions. The user is free to choose the documentation format of his lessons learned. Once the lessons learned are created, the knowledge manager decides where to store these documents.

It is very important to the knowledge manager that people create awareness for what they have learned. They need to assess the importance of what they have learned for themselves and for others. The emphasis of the lessons learned lies on creating moments to reflect on experiences in a project phase. The usage of existing lessons learned is not sufficient, but there is progression in the creation of lessons learned.

At the moment, lessons learned are only implemented in the R&D department and in a few Global Venture Teams (GVTs). The intention is to apply lessons learned in other departments of Organon, such as Marketing, and Sales. Whereas these departments barely operate on a project team basis, it is of great importance here to share experience. By sharing knowledge a best practice can be formed. The implementation of KM measures has low priority due to Xlence, a reorganization program of Marketing and Sales.

Most of the lessons learned from R&D are available on the knowledge management website on intranet. Because of the classified material, access to the lessons learned created by a GVT are mostly limited to the GVT self and sometimes to other GVTs. The GVTs also hold meetings to discuss their findings with each other. In this way knowledge and lessons learned are still shared between GVTs.

The role of the knowledge manager here is to facilitate lessons learned sessions. Each year, the knowledge manager asks for lessons learned from the R&D department managers. In accordance with the purple booklet, department managers are obligated to create their own lessons learned. The creation of lessons learned demands a change in Organon's work attitude. People need to make time to evaluate their projects. It takes a lot of time and effort for the knowledge manager and the managers involved realizing this change.

Lessons learned as a KM initiative is in the implementation phase. Whereas the knowledge manager has no time to expand this project due to other projects, the focus now is on the utilization of the actual lessons learned.

Compared to the situation before implementing lessons learned, people are now more aware of benefits of the lessons learned sessions. The usage of lessons learned is not evaluated yet. It is still unknown what the people's experience is with the use of existing lessons learned since not many have utilized actual lessons learned.

Mentoring

Akzo Nobel's mentoring program is an initiative taken from Young Akzo and it will be implemented throughout Akzo Nobel. The purpose of the program is to create mentorship, a relationship between a more experienced mentor and a less experienced partner referred as mentee. Organon has also started its own mentoring program for the R&D sector.
The first project within R&D is aimed at people who are entering a new function, such as section leader or project leader. Through mentoring, these people receive the support and guidance they need to perform their new role. The purpose of this mentoring project is to shorten the learning curve. The head of the research department and the concerning HR manager are responsible for the matching of mentor and mentee. In this case mentors are mainly department managers.
The second project is focused on junior mentoring. PhD graduates new in Organon are introduced to the company's interdisciplinary work environment. They receive guidance and help to build their social network. At the moment, there are fourteen PhD graduates following this program.
Shortening the learning curve is the aim of both mentoring projects. Here, procedures and training for mentoring are developed by the HR department. Training is needed to prepare people for their new role as mentor.
Based on the results of the projects, Organon intends to implement mentoring in other departments. The actual procedures and training serve as a basis for the mentoring program. The implementation of this KM initiative throughout the company requires certain changes in the mentoring program. The mentoring program is expected to be ready for implementation in October 2006.
Mentoring will initially be set up for a small target group. To ensure a high effectiveness for this initiative, only promising candidates are considered to join the program. Candidates should have potential to learn and grow fast. Mentoring should not be mistaken with career coaching as it is focused merely on employee development instead of career advancement. To avoid conflict of interest, no line relation should exist between mentor and mentee. The mentor offers guidance and support to the mentee by helping him to develop necessary competences.
People can indicate self if they are interested in this role, or they are asked by a manager. In both cases they need to be in the position of mentoring skills. Skills such as listening, giving feedback, and helping individuals how to tackle problems, can also be trained. The Global Learning Center (GLC) is appointed to develop these training programs.
The employee self decides whether he needs a mentor or not. Being responsible for the employee's learning process; the direct manager will look for a mentor in his own environment. When the manager is not able to find an appropriate person, this task will be handled over to the HR manager. The final selection of a mentor is then made by the line manager and HR manager.

4.1.3 Training and education

Organon competes in an ever changing market. To remain competitive, the company needs to continuously improve. Organon stimulates continuous learning by providing training and education.
The Global Learning Center (GLC) and local human resource functions provide training and education to employees. Local departmental trainers make sure that competencies, specific to that department are developed at the required level. The GLC develops and implements global training programs that are applicable to employees in multiple countries and departments. Training development budgets are provided by the involved business areas. Also the cost of delivered training is charged to the participants' department. The GLC focuses on leadership development, and training in the R&D, sales, marketing and medical areas.

The global training programs are implemented by trainers in local companies. These trainers are also responsible for the development and implementation of training programs for specific local needs.
In 2005 more than 6000 education courses are taken by Organon employees, while the total workforce consists of less than 5000 employees (see workforce statistics in appendix 3). Compared to other sectors, most courses are taken by the R&D sector in Oss.
The GLC manager believes that learning is a mean to serve a business need. Although top management has communicated learning throughout the company, in practice learning is only important it if helps you to attain your goals. In all other cases, learning is not essential.

4.2 People and human resource

People and human resource have a large influence on knowledge management. The age demographics and trends in the Organon workforce explicate the danger of an aging workforce. The job transfer and succession planning describe the process of how the knowledge retention takes place within Organon. Finally the human resource policy will be described.

4.2.1 Age demographics and trends in the Organon workforce

Changes in the workforce have an impact on the ability of the organization to manage and fully utilize its knowledge. The most important of these changes are the result of an aging work force, reorganization, turnover, and insufficient succession planning.
Today, there are 4997 people working at Organon the Netherlands. Most of them work in the R&D sector in Oss. After a period of decreasing workforce, a slight increase of employees can be seen.
The limited recruitment of the last few years has effect on Organon's age structure (see figure 8), the percentage of employees younger than 38 has decreased further to 43.0% in 2005. Within a period of five years, the average age increased with 2.2 years.

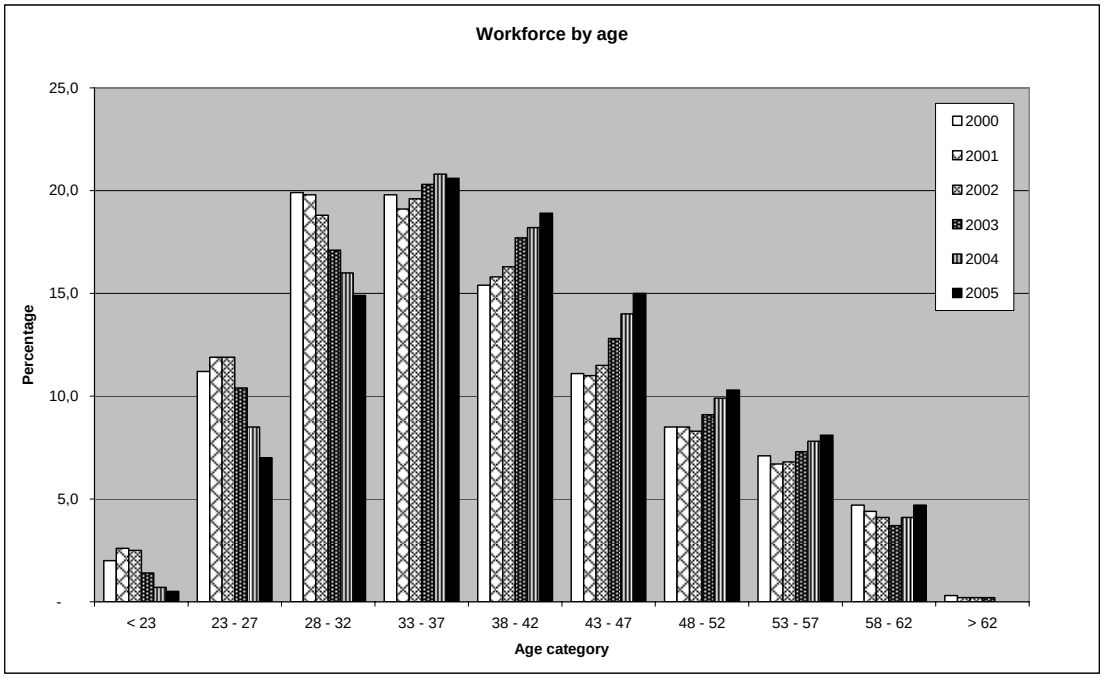


Figure 8 Age structure in Organon

Due to the reorganization in 2003 and 2004, the turnover rate has raisen to respectively 7.2 % and 6.2%. In this period, a lot of temporary contracts were not renewed. The reorganization has reached its final phase in the beginning of 2005, and the turnover decreased to 3.9%. The total number of employees leaving the company was at that time 195. The total number of people recruited in 2005 is 258, of which 121 of them with a temporary contract. Most of the accessions have taken place in the R&D sector.

The Human Resource (HR) manager has addressed the downside of a low turnover. A low turnover rate is an indication of an aging workforce. It is very important to the pharmaceutical industry to have a continuous inflow of young people.

The official retirement age in the Netherlands is 65. In Organon, employees are allowed to go on early retirement or prepension at the age 60. In practice, people retire at the age of 62. The percentage of people leaving the company caused by retirement, pre-pension, long term sickness or death has increased to 28.2% in the last years. At present there are ten pensioners working for Organon on a freelance basis, or as consultant.

It appears that 48.2% of the voluntary staff turnover can be prevented. Most of the time, people are leaving Organon for better career opportunities. A challenging job and a higher salary are the most common reasons for resignation. Also, travel distance can be a motive for changing jobs. The turnover rate of employees in important positions or senior management is not very high. On the other hand, there is a lot of mobility in this group, as people change positions frequently within Organon.

As a result of the reorganization in 2003 and 2004, many positions were made redundant. In 2004, one fifth of the total separations were related to the reorganization.

In 2005, 7.5% of the workforce made an internal transfer. That comes down to 373 people changing positions within Organon. Most of the transfers take place within the same sector.

With 4.5% Organon has the second highest percentage of sick leaves within Akzo Nobel. Thirty percent of the people in Organon have never taken sick leave. Against all expectations, some R&D departments within different sectors face a high absenteeism, while other departments have a low absenteeism. For detailed information of the workforce statistics, see appendix 3 Organon workforce statistics.

4.2.2 Job transfer and succession planning

Organon has a policy and preference for filling positions internally, as opposed to external candidates. Where possible Organon will take account of employees going on retirement, or being transferred to other functions. This implies that the company tries to appoint a successor beforehand, and/or let the successor be trained by the departing person. The notice period for higher-level staff is three months, while the notice period for lower-level staff is one month.

Retiring people create free vacancies, which have to be filled. To address the problem of finding suitable candidates and to replace the loss of any key person, Organon is introducing a succession management policy. Before an employee can hold a high-level position, they need to have many years of experience. Organon wants to prepare its employees for these positions by providing proper training, and by placing them in a series of jobs in different sectors to broaden their scope of experience with and exposure to the organization. It takes years of grooming to create a suitable pool of candidates with high leadership potential. External candidates will be selected when positions can not be filled by Organon candidates.

The development of the lower-level staff is primary the responsibility of the employee self and the line management. Line management takes care of employee development, and career coaching issues of its staff. The selection of successors for low-level positions is made by line management. The HR manager has a consultative and supportive role in this process. When needed, the HR department provides training and education.

Succession planning for higher-level positions is already seen on a local level. As part of the issues discussed within a Management Development (MD) meeting, succession planning takes place haphazardly. Succession within line function is the responsibility of line management. Information about how many people planning to go on retirement and pre-pension are not available. The MD meetings are held four times a year and are attended by the HR manager and the department heads.

For example, when a department head of Medicinal Chemistry (senior executive level) in Oss is going on retirement, the local Head Research in Oss and the International Head Research will decide who is going to be appointed for the new position in Oss.

The new established Global Human Resource Development (GHRD) department supports the development and succession planning process for senior executives. At the moment, Organon has a successor for each senior position.

In practice, however, many positions are not filled in time. In case of internal transfers, people are already in their new position while the old position remains vacant. It is the responsibility of the departing employee and the line manager about how the employee will handle the job transfer.

There is no general policy for how to process a job transfer. Every department has its own way to handle a job transfer. When the company cannot find a successor in time, the departing employee has no opportunity to train and transfer his experience to the successor. Though a lot of knowledge is documented, the future successor must still learn much on his own. The high cost of having two people in the same job is for Organon a reason not to invest in this method of on the job training.

4.2.3 Human resource policy

The Performance & Development Dialog (PDD) program is initiated by Akzo Nobel to evaluate employee performance. The program is aimed to compare achieved results against fixed objectives and make performance differences visible based on world-wide, consistent criteria. The purpose of the PDD is also to evaluate the employee

competencies and determine the need for personal development. Moreover, the PDD can be used to give direction to the functioning of the employees. By acknowledging and rewarding best performance and addressing unsatisfactory performance, the company wants to improve the business performance of the company. Employees are rewarded for their achievements.
PDD originally measures six core competencies and three people management competencies. These competencies are related to the overall organization. The GHRD has identified one additional competency to cover business strategies, knowledge and skills, and has developed additional descriptors for the existing core competencies to make the PDD more robust.
The GHRD manager finds that Organon shares a number of operational characteristics with Akzo Nobel. In practice, however, there is little consistency between different parts of the company. The company is very diverse and has no common system for the handling of issues in HR. The implementation of the PDD program thus gives an opportunity to enhance consistency, particularly for HR issues.

4.3 Culture

According to the GHRD manager, Organon has a silo culture. In such a culture, people work within their particular business function. Employees mainly interact and share knowledge within the department. By applying cross-sectional team structures, Organon is trying to overcome vertical silo acting.
Despite the reorganizations and redesign of business processes, Organon is still influenced by silo thinking. One example of a culture change program is 'Bridging Research and Development', which consists of a reconstruction project with the purpose of physically connecting the research department with the development department.
The GLC manager thinks that each department within Organon experiences and perceives knowledge management differently. Some departments apply an active knowledge management policy, while other departments hardly pay attention to knowledge management. Also at the individual level there are differences. There are people who are open to knowledge sharing, and there are people who are not. These people believe that knowledge determines their value to the organization and that by sharing their knowledge, they are depleting their own personal 'stock' of knowledge and thus will diminish their own value to the organization.
Also the knowledge manager remarks that knowledge management is practiced in fragmented and isolated parts within Organon. KM initiatives are still used and supported by 'knowledge management believers'. One of those believers is the project manager of the Asenapine GVT. He is very active in promoting and stimulating knowledge sharing activities, such as lessons learned. The knowledge manager fears that when this project manager leaves, other GVTs will stop practicing knowledge management. Furthermore, the knowledge manager has already noticed differences in approach between the different GVTs.
The GLC manager finds that learning is not fully integrated in Organon's culture despite the management's messages to the organization. The company does not realize the potential of learning and its benefits on the long term; departments differ in their opinion of learning. The GLC manager believes that learning is a means to obtain the company's goals. If an employee does not need learning to accomplish his tasks, then learning is not necessary.
According to the GLC manager, top management is not fully aware of the strategic importance of learning. He thinks that a culture change can be established when managers are convinced of the importance of learning. An increase of supporters will then lead to more management support. Both GLC manager and knowledge

manager agree that Organon's top executive is pragmatic and primarily business focused.

4.4 Strategy

Organon's main business priority is the Initial Public Offering (IPO) of its common shares on the public stock exchange. The other priorities of the company are the implementation of the Xcellence program and succession management program.
Less attention is paid to learning, whereas human resource development and learning is part of the organization strategy. According to the Global Learning Center (GLC) manager, this can be ascribed to the Organon's perception of learning. In his opinion, Organon is very focused at the present and not much at the future.

4.5 Structure

The organization chart in appendix 4 shows that Organon has a centralized departmental structure. With the exception of the marketing and sales departments, people are working in small teams within their departments.
Organon has applied teamwork to break down the functional or departmental barriers in people's thinking. The implementation of cross functional teams, such as Global Venture Teams and Proof of Concept teams, are aimed to create synergy with the available knowledge.

4.6 Technology

Organon has a well developed Information and Communications Technology (ICT) infrastructure. It consists of a broad range of data communication facilities, such as intranet, extranet, internet, email, telecommunication, document management, and knowledge management. An ICT department is responsible for the development and maintenance of this infrastructure.
The company uses sharepoints and Documentum to store data. Documentum is a document management system used by Organon's Regulatory Affairs and production departments to comply with FDA regulations. Sharepoint is a flexible, information sharing and electronic collaboration system. It can be used to store informal, unregulated documents. This system enables the information access and collaboration processes. Moreover, a lot of information is available on the intranet.

4.7 Case study: Livial Global Venture Team

To introduce Livial into the United States, a Global Venture Team (GVT) is set up, which is primarily responsible for the registration and launch of Livial in the United States.
The Livial GVT is a team composed of experts of various disciplines with a direct line responsibility to the GVT leader. The concept behind the GVT is to combine knowledge of all members to create synergy. The GVT coordinates the work of functional departments from development, regulatory and commercial, and takes care of the progression. Livial GVT members have worked with Livial for years before they were assigned to the team.

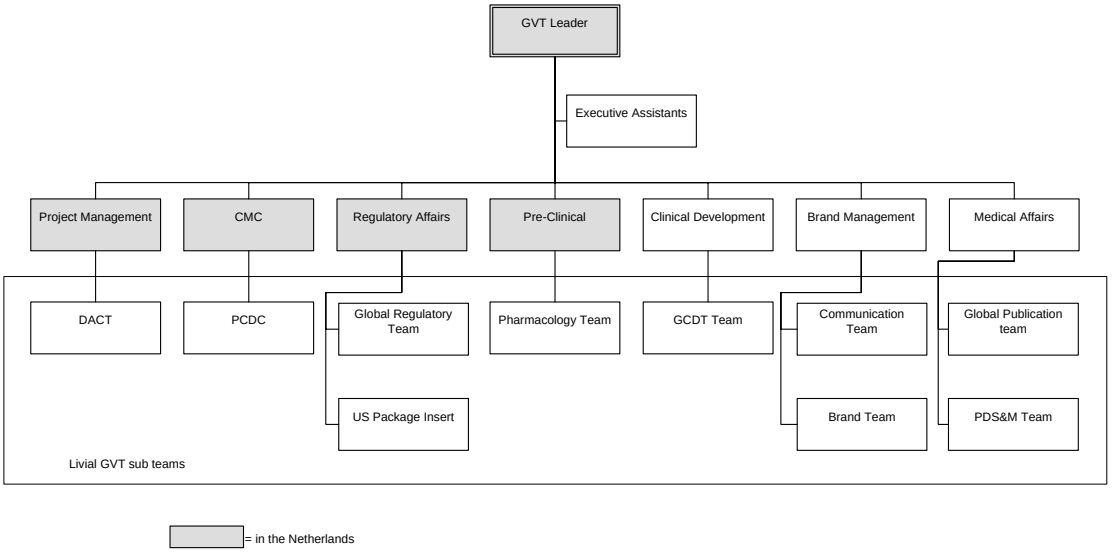


Figure 9 Livial GVT structure

Livial GVT is composed of eigth members: The GVT leader and Project Manager, and representatives from Chemistry, Manufactering and Controls (CMC), Regulatory Affairs (RA), Pre- Clinical, Clinical Development, Brand Management, and Medical Affairs. Some of the members are seated in Oss (NL) and some in Roseland (US). Six members will be discussed in the following section.
Functional departments from development, regulatory and commercial are working together with Livial GVT in sub teams to create an integrated strategy and execute the plans approved by the GVT. The efforts of these departments are coordinated by Livial GVT sub teams. These sub teams are depicted in figure 9.
All the sub teams are led by a GVT member. In some cases, more than one GVT member takes part of one sub team. The sub teams form a liaison between the Livial GVT and the department. Strategic deliverables from the sub teams are then presented to the Livial GVT.
The Livial GVT leader reports in line to the Executive Vice President (EVP) Marketing & GVTs, and functionally to a team consisting of the Senior Vice President (SVP) Global Development, EVP Medical Affairs & Development and the EVP Marketing & GVTs. Livial GVT members report via a direct line to the GVT leader.
The Livial GVT itself has specific product knowledge in the field of medical, scientific, development, registration and marketing. It also has more common knowledge about other HRT products in the field of relief of post menopausal symptoms, such as hot flashes, osteoporosis, female sexual dysfunction, etc.. The GVT also have specific knowledge about the registration process and issue management of this kind of products.

4.7.1 Team members

Here I have interviewed the most important members of the Livial GVT. The team consists of the following members: team leader, CMC member, regulatory member, preclinical member, brand management member, and medical affairs member.

Team leader

The team leader has supervision of the internal and external communication of the Livial GVT. She has overall responsibility for the GVT and takes part of all decision processes. The team leader is appointed to manage the Key Opinion Leader (KOL)

network. Moreover, she is the one who communicates with higher management and has extensive contact with registration authorities.
The team leader has worked with Livial for nine years and is very aware of Livial's product history. She is a clinical expert with an expertise in safety issues. Safety issues, such as breast cancer, cervical cancer, and cardiac infarction, are very important for the registration of Livial.

Interview
The team leader considers experience and network as the most critical issues to Livial GVT, since all the 'hard facts' are already documented.
She points out that during the course of an application review, she has often communicated with the FDA about scientific, medical, and procedural issues that arise during the review process. Some authorities find certain issues more important than others; this is in most circumstances not clear until the discussion takes place. In these meetings, the GVT leader tries to convince the authorities by bringing up weighty arguments. She believes that this kind of implicit knowledge acquired through the review, discussion and decision processes are very critical to KM at Organon.
According to the team leader, there is a high possibility of reinventing the wheel after the disintegration of Livial GVT. New people in the Global Marketing department will become responsible for the product, but without knowledge of the product history, past studies and decisions. Nevertheless, she thinks that a lot of knowledge of Livial is not necessarily lost, but still present within Organon. Dispersed throughout the company, this knowledge is available in the Global Marketing department and local companies.
Still, network contacts are fragile. For example, external people who have done studies in the past are not known by the new Global Marketing people. Thus, Organon is losing external product knowledge due to the loss of network. The team leader thinks that relation management in the scientific world is very important considering the lengthy collaboration required for projects.
The departure of the preclinical member has also an adverse impact on the company. Besides the fact that he has a large external network, he also represents Organon. In her opinion, the loss of these kinds of personal networks is the most crucial to the company.

CMC member
The CMC member is head of the PCD-C team and is responsible for the Chemistry, Manufacturing & Control (CMC) activities of the Livial GVT. He coordinates CMC activities, Investigational Products Supply (IPS) technical contacts and Technical Supply Chain Manager (SCM) contacts. Information gathered by the PCD-C team will be communicated via him to the GVT.

Interview
The Livial CMC member is an important position because it has knowledge and experience of the whole product development process. He assumes that his knowledge is useful to other GVTs and final-phase PoC teams. The CMC member shares his experiences and problems with CMC members from other GVTs during informal, once a month meetings. Important issues are discussed in the Livial GVT, while small issues are documented within the department. Although these data are documented he still finds it hard to retrieve the required data.
The CMC member uses his network for two purposes. First, to obtain knowledge. According to him, around fifty percent of his knowledge is acquired through his personal network. He uses his internal network to solve organizational problems. External contacts are consulted to solve technical issues. The second purpose is to

seek support. The CMC member believes that support can be gained by engaging influential persons in certain decision processes.
The personal network of the CMC member consists mainly of Organon members with a few external members.

Regulatory member

The regulatory member is the head of both sub teams; the Global Regulatory Team (GRT) and the US Package Insert Team. She is in charge of the Regulatory Strategy Plan (RSP) for the submissions of the treatment of climacteric symptoms, and osteoporosis.
The regulatory member is responsible for the development and assembly of the submissions of the Investigational New Drug (IND) and the New Drug Application (NDA) filings. She also needs to write the clinical overview. The clinical overview presents an integrated and critical assessment of preclinical data, clinical data, and chemistry and manufacturing information.

Interview

Over the years, the regulatory member has gained significant knowledge and experience in regulatory affairs. Before joining the Livial GVT, she worked as a RA member in diverse study teams. The regulatory member specializes in regulations for certain indication (prevention osteoporosis, preclinical, etc.). In her opinion, her knowledge consists of knowledge of Livial and other Hormone Replacement Therapy (HRT) products, and knowledge of the regulatory process.
Results of past studies are documented in the Documentum system. According to the regulatory member, files are authorized after FDA submission. This implies that no one can change the content of the submitted file. The document is then only accessible by people of Regulatory Affairs and management board. For security reasons, even people who have worked on this product do not have access to these completed documents. Separate parts of the documents, such as study reports, can be accessed by the people from the concerned departments. Experience with the submission and decisions processes themselves remains undocumented.
Although the regulatory member makes numerous contacts with regulatory authorities, she mainly uses her internal network to obtain knowledge. She also uses a few external contacts to review the drug applications. These external contacts are mostly operating as consultants for Organon.

Preclinical member

The preclinical member is the head of the Pharmacology team. He coordinates Mechanism of Action (MoA) activities. The preclinical member is responsible for the documentation of the role and MoA, and the interpretation of data. As a member of the Global Publication team, he gives input to the publication strategy and content.
The medical knowledge of the preclinical member is very important to Organon. With 25 years of experience, he is an expert in steroid knowledge. In the field of preclinical pharmacology, making hypotheses, setting up tests, and interpreting data are important areas of expertise. Experience with similar drug substances is needed and one should be able to draw a parallel between MoA of the drug substances. Here, the interpretation of clinical data is an especially important skill.

Interview

GVTs are set up with a strategic purpose. The preclinical member thinks that in reality, Livial GVT was more involved in operational than strategic issues. A lot of preclinical studies have taken place in the Livial GVT. Both Preclinical and Marketing are working together in the Livial GVT. Marketing's work is based on certainty, while the work of the preclinical member entails a high degree of uncertainty. Thus, there is

often friction between these two differing functions, which sometimes work at cross-purposes. In his opinion, a GVT should work with certainties and therefore start from Phase III.
The preclinical member feels that little attention is paid to evaluate the decisions made. Lessons learned are not really implemented. To his eye, Organon has no strategic knowledge management policy. Despite the fact that Organon uses systems and procedures to document and store knowledge, he finds that the company does not care for people management. There is a lack of efficiency in the use of knowledge; synergy can not be reached because little knowledge is shared between the different disciplines.
Moreover, he concludes that the company has no succession planning for the Livial GVT. Organon does not take on the job training for GVT successors into account. The preclinical member has shared his steroid knowledge and network contacts with one of his colleagues in Oss. He and his colleague have worked together writing scientific publications and presentations for the past 18 months. The preclinical member's intention is to make him his successor for this knowledge area. Furthermore, he has also given on the job training to a medical person in the US. This collaboration stopped due to the FDA refusal.
The preclinical member has a large external network of scientific experts. He notes that he often consults his network for interpreting test data. When he makes certain hypotheses, he can use external experts as sparring partners and ask their opinion. The preclinical member considers medical knowledge as one of the most crucial knowledge of the Livial GVT and Organon.

Brand management member

The brand management member is the leader of both the Communication team and the Brand team. She is responsible for the coordination of marketing activities in the G5 countries, and the brand management of the product Livial. As a member of the PCD-C, she gives marketing input in PCD-C activities. She also communicates with the US marketing, the Global Marketing, and supply chain management. Finally, she also takes part in the Global Publication team.
The brand management member has six to ten years of experience with the product. She knows how the market looks like, who the players are, what the competitor's products are, how their products are positioned, and the market growth. Very important, she also knows what Key Opinion Leaders (KOLs) think of the product. All of above mentioned, is competitive intelligence.

Interview

The brand management member believes that the most important knowledge that cannot be documented is the network. She obtains most of the information from her external network. Since she knows the people in person, information reaches her earlier. She also has an internal network. Her network has much overlap with other team members, though the content is different. The brand management member has business related contact with KOLs, while the GVT leader has contact with them about safety issues
A lot of information is available on sharepoint and documentum. Although sharepoint and Documentum are easy to use, she thinks that it will be very hard for her successor to find information.
The brand management member considers knowledge management to be a weakness for Organon. At the moment, there is no person appointed for Livial marketing at the global level. She remarks that although she writes down all knowledge, the team already lags behind in documenting important knowledge. The brand management member tries to inform the new manager of global marketing by copying him on all the important emails. Still, according to her, knowledge transfer does not take place effectively. She has no successor to whom she can share her

knowledge with. Since no knowledge management activities take place, she is inclined to say that top management is unaware of knowledge management.
Furthermore, she thinks that the company started too late with succession planning. The policy should be that a leaving person has at least four weeks to transfer his job and to introduce his successor to the KOLs. Here, personal contact is very important. To anticipate knowledge sharing R&D and Global Marketing need to work together. And there should be a more personal management approach for people.
After the dissolution of the Livial GVT, all questions are directed to Global Marketing. Based on the nature of the request, the request will be forwarded to the concerning departments. The brand management member assumes that former team members are willing to help out, but this kind of behaviour will diminish after a while.
Two sub team members of the brand team have already left their positions. Both departures were known beforehand. Management has taken no action to find a successor in time. Just a few days before his departure, Organon's management team has asked the brand management member to cover his position. It is very easy for her to follow on his tasks, but she prefers to do something else. The brand management member has announced that she is willing to cover this position until a successor is found.

Medical Affairs member

The medical affairs member is the head of the Global Publication team and the PDS&M team. He is responsible for the strategic publication plan and the publication output. As a GCDT and GRT member, he gives input in clinical trials and regulatory activities. Moreover, he communicates with US marketing and Global Marketing.
The medical affairs member is engaged in the knowledge transfer from product development to marketing, and the publication of articles in scientific journals. He is a mediator of the knowledge flow between Organon and its external environment. On the one hand, knowledge derived from clinical development will be translated into publications in scientific journals. On the other hand, knowledge of Livial from external sources is gathered by the medical affairs member.

Interview

The medical affairs member suspects that knowledge about the registration process and issue management of HRT products in the field of relief of post menopausal symptoms is very crucial to the GVT. Moreover, a part of the knowledge within the Livial GVT is tacit. The most important persons with tacit knowledge are: the preclinical member, team leader, regulatory member, medical affairs, and global marketing member.
He thinks that for these team members, the personal networks are a crucial way to obtain knowledge. According to the medical affairs member, the team leader has extensive contact with authorities about issue management, while the regulatory member has contact with authorities for regulatory aspects. The global marketing member's competitive intelligence and her external network are also very important for the Livial GVT. The network of the preclinical member consists of scientific contacts; the network of the medical affairs member consists of KOLs.
The medical affairs assumes that the risk of reinventing the wheel increases after the disintegration of the team. He also believes that the knowledge and experience of Livial GVT members can be used by others who are working with similar products. They can encounter the same problems, just as Livial GVT did.
Furthermore, he states that Livial GVT has no specific knowledge management policy. Documents of the Livial GVT are documented in the software program Documentum or stored in sharepoints. The distribution and access to certain documents depends on the type of document. Some knowledge is distributed widely including the public domain such as publications and communication tools, while other knowledge is limited to a select group within the GVT. The medical affairs

member believes that most of the knowledge is documented and that other knowledge will be shared by team members who return to their own department.
The preclinical member is on retirement, but he will continue his work as a part time consultant for Organon. Most of his knowledge is published or documented. The medical affairs member remarks that some GVT members have already left the company or changed positions. In his opinion, Organon has chosen for interim solutions to solve this knowledge gap by appointing other Livial GVT members to temporarily cover these positions.

4.7.2 Conclusion

The Livial GVT itself has significant product knowledge in the fields of medical, scientific, development, registration and marketing. All the members believe that important knowledge is already documented. This demonstrates, as we discuss more in depth later in the report, that knowledge management for many Organon employees is synonymous with storage and retention of knowledge, without regard to the processual, interactional activities by which knowledge is produced and used—in other words the process of *knowing.* Knowledge about the registration process and issue management of HRT products in the field of relief of post-menopausal symptoms is very crucial for the team.
Most of the members believe that experiences and their personal networks are important sources of knowledge which are not documented. Livial GVT has no specific knowledge management policy.

5 Analysis

In this section, we will apply the theoretical framework from chapter 3 to the findings from the previous section, to produce an evaluation of, and recommendations for knowledge management at Organon.

5.1 Knowledge management enablers

As discussed earlier, the five enabling factors create a kind of 'protected space' in which the reciprocal interplay of knowledge and knowing can occur. Therefore, in this analysis section, we begin with an evaluation of the enablers, using the framework, to assess the degree to which they contribute to and support, or, alternatively detract from the creation of a protected space within which knowledge can be used, and also produced.

5.1.1 Culture

Despite the significant KM efforts made by Organon, the organizational culture can hardly be considered 'knowledge friendly'. Most importantly, though knowledge is shared within departments, communication between departments is characterized by a low level of trust, thus obstructing the process of knowledge sharing. Though teamwork and education stimulate the sharing of knowledge, it can not overcome the effects of culture in general, and a low trust level in particular.

Fit between knowledge management type and culture

The silo culture of Organon is characterized by lack of cross-departmental communication and common goals between departments. This is reflected in the knowledge sharing that takes place within departments but not between departments.

For example, the distribution of and access to documents is restricted, and depends on the type of document. For certain documents, because of their confidential nature, access is even limited within the department. The way knowledge is managed matches the silo culture (Davenport & Prusak, 1998); the knowledge management type supports knowledge sharing *within* the department.

When Organon wants to stimulate knowledge sharing *between* departments, then the company should focus on both culture and knowledge management type. Since cross-functional knowledge sharing is not linked to the pre-existing core value of the organization (McDermott & O'Dell, 2001), Organon has tried to realize a culture change by altering visible aspects of the organization (Schein, 1992). This resulted in the change program 'Bridging Research and Development'

Collaboration

In general, teamwork and collaboration are seen within the departments, but less so for the marketing and sales departments. The purpose of PoCs and GVTs is to stimulate cross-sectional knowledge sharing. Knowledge is shared between departments through the interactions within the teams. Here, working in teams has a positive effect on knowledge creation through knowledge exchange (Nahapiet & Ghoshal, 1998; Von Krogh, 1998).

Trust

During past reorganizations, many employees were made redundant. Also the IPO brings about additional uncertainties for the employees. Combined, these events have a negative influence on the employees' trust of their own organization, and it can seriously inhibit effective knowledge sharing (Davenport & Prusak, 1998).

The level of trust has influence on employee supportiveness and commitment (Brockner et al., 1997; Nahapiet & Ghoshal, 1998). For example, in Organon people feel that by sharing their knowledge and expertise, their value and influence in the company will be reduced. The treatment of knowledge as a possession is evident here, as people believe that sharing their knowledge is equivalent to 'giving away' and reducing the amount of knowledge they 'posses'. As discussed earlier, this is very different than the view of knowledge—or knowing—as a process, which places highest value on the activities people undertake for KM, rather than on the knowledge they may possess, that is, essentially, 'in their head' and unavailable for use by those around them.
In summary, the presence of knowledge inhibitors suggests that some people within Organon have a low level of trust.

Learning
Organon has done well to provide opportunities in the area of learning. The high number of education courses taken by Organon employees demonstrates that learning is highly valued. Moreover, the implementation of the mentoring program has a positive effect on a learning environment. The relationship between a mentor and mentee stimulates knowledge sharing (Swan et al., 2000; Swap et al., 2001).
Yet, despite the provision of learning opportunities, the GLC manager states that learning still does not seem to be well integrated in Organon's culture. According to him, not every manager is convinced of the importance of learning. This has its consequence for the number of training delivered and programs developed. The company does not appear to realize the potential of learning and its benefits on the long term.
Organon has not reached the optimal state of a learning culture, which implies a negative effect on knowledge creation (Quinn et al., 2005).

Conclusion
As we have shown, Culture as an enabler of KM at Organon has some strong points, particularly the provision of courses, and a mentoring program. However, the presence of knowledge inhibitors has a negative impact on knowledge sharing, particularly between departments.

5.1.2 People
The people factor at Organon does not contribute significantly to enhancing knowledge management. The human resource function does not take certain opportunities to use its influence to support knowledge management. For example, the evaluation and compensation structure does not support knowledge sharing behaviors. Also, management support for knowledge management is limited. And finally, the company does not legitimate important personal networks.

Human resource policy
According to the GHRD manager, the diversity of the company limits the possibility for common cross-department policies and systems for handling HR issues. The lack of a general job transfer policy is an example of the inconsistency between different parts of the company. As a result, when there is no successor, knowledge is literally walking out the door. Although a lot of knowledge is documented, the experience, skills and personal networks of the departing employee is not captured. Moreover, it shows that the human resource function does not place high priority on the risk of knowledge loss.
Organon has made progress regarding succession management. To face the problem of finding suitable candidates to replace the loss of any key person,

Organon has introduced a succession management policy, an effective contributor to successful knowledge management (Carter & Scarbrough, 2001). The purpose is to create a pool of candidates with high leadership potential. The employees are placed in a series of jobs in different sectors and receive proper training. This policy is not, however, applied to low-level staff, and this may be an opportunity for Organon. Furthermore, engaging retired employees as consultants is for Organon a way to slow down the process of knowledge loss (De Long, 2004).
The reward and recognition policy is focused primarily on short term performance, and without inclusion of rewards and recognition for knowledge sharing/ producing activities.
Whereas Organon's succession management policy is an initiative with a long term focus, the overall human resource policies, such as the reward & recognition policy and the lack of a general job transfer policy, suggest a short term focus. Thus, in general, we see that the HR function is not taking advantage of the opportunities to apply its influence in enhancing knowledge management efforts at Organon.

Motivation
Based on a number of factors, we believe motivation for employees at Organon to actively participate in knowledge sharing and knowledge management is low. As discussed, there is no reward system in place, and the culture does not strongly support knowledge management. In addition, Organon also suffers from a high sick leave percentage. Moreover, the company's evaluation structure concentrates on individual performance, thus employees are less motivated to share knowledge when they are judged only by their individual performance.
Thus, due to a culture that does not actively support knowledge management, lack of clear incentives, and a focus on short-term, individual performance, employees are neither intrinsically nor extrinsically motivated for active participation in knowledge management at Organon. A few people, of course, are very interested in knowledge management. As true 'knowledge management believers', they actively promote and stimulate knowledge sharing activities and these activities can have beneficial effect on overall KM effectiveness

Management support
In general, a lack of management support for KM contributes to a low level of awareness of knowledge management initiatives. Knowledge management is only locally practiced by few knowledge management sponsors. These people actively support and promote knowledge sharing. The departure of these critically important few could have a significant and far-reaching negative impact on KM at Organon.
Knowledge management programs are long term projects with benefits that are hard to measure (Davenport & Prusak, 1998). Thus, to be successful, top management must make KM a visible priority, over the long term.
Unfortunately, it appears that the KM at Organon is currently suffering from lack of top management support due to other strategic-level priorities.

Human networks
The area of human networks is one of the strongest performing areas for KM at Organon. However, we see considerable opportunities to make the performance of networks and their contribution to KM even stronger.

The company does a good job by funding and formalizing certain human networks. Knowledge sharing on certain topics is enhanced due to the CoP and CoI activities, known to be important factors for successful KM (Lave & Wenger, 1991). The CoPs are set up to maintain expertise about topics important to the company. Resources for these are made available by the sponsor of the concerning business need. To make sure members can easily contribute and access the community's knowledge

and practices, IT support is provided to both CoPs and CoIs. Organon also allows its employees to make time for their participation.
Every community is governed by a core of participants who provide intellectual and social leadership. People who are interested in a certain topic can join the community in question. Since the topics are in some way connected to their work or interest, members are intrinsically motivated to participate in these communities. By maintaining the informal, self governing character of these communities the organic character of natural networks—and the knowledge sharing that results—is preserved (McDermott & O'Dell, 2001).
Most of the Livial GVT members have indicated that they rely on both co workers and external parties to accomplish their tasks. According to the CMC member, personal networks are used to obtain knowledge or to seek support. While some of these networks, such as the KOL network, are crucial to Organon, personal networks are still not legitimized and supported.
An organization can be considered as a collection of networks (McDermott & O'Dell, 2001). The departure of key people in the Livial GVT significantly affects the relationship structure and consequent functioning of the organization. As team members leave the company, their personal knowledge and the knowledge that they acquire through their network will become lost. Considering the lengthy collaboration projects the team leader has indicated that relation management is very important.
The level of awareness at Organon of this problem is low, and therefore actions are not taken.

Conclusion
At Organon, human networks are an important contributor to KM. However, these networks suffer from inadequate legitimation and support from the company, and thus have the potential for making an even stronger contribution. Other areas of the 'people' enabler, however, show need for improvement in the support of KM. Specifically, HR policies lack incentives for KM activities. When combined with insufficient management attention—assumedly due to the long-term and intangible nature of KM—the result is low motivation for employees to actively participate in KM at Organon and within Livial GVT.

5.1.3 Strategy

Currently, the focus of strategic planning efforts concentrates on Organon's Initial Public Offering (IPO). The other strategic-level priorities of the company are the implementation of the Xcellence program and succession management. Although human resource development and learning is communicated to the organization as being part of the Organon strategy, top management appears, at least temporarily, to be unable to devote more attention to knowledge management.

5.1.4 Structure

Organon has invested a lot of time and effort to change its organization structure. Unfortunately, the beneficial impact on KM appears to be limited. In theory knowledge sharing in Organon is partly supported by this organizational structure, though this is not the case in practice.
Organon has a centralized departmental organization structure. The combination of such organization structure and a silo culture hinders interdepartmental communication and reduces creative solutions (Lee & Choi, 2003; Stonehouse & Pemberton, 1999). There is a large possibility that ideas and knowledge become distorted due to time-consuming communication channels (Bennett & Gabriel, 1999; Stonehouse & Pemberton, 1999; Woodman et al., 1993).

Using multidisciplinary teams, such as PoCs and GVTs, the organization structure supports the creation of holistic organizational knowledge. Still, there is a lack of efficiency in the use of knowledge; within the Livial GVT little knowledge is shared between different disciplines. Apart from Marketing and Sales, people work in teams within their department. Here, experts can interact, exchange ideas and develop new specialist knowledge (Stonehouse & Pemberton, 1999).
The appointment of a knowledge manager is a good initiative to enhance knowledge sharing (Davenport & Prusak, 1998). The knowledge manager facilitates the planning and implementation of the KM initiatives. Startup time and costs of knowledge management projects can be lowered with the support of the KM manager. However, because of insufficient management support, because the knowledge manager role is not a full-time role, and other factors beyond control of the knowledge manager, the impact of the role has been diminished.

5.1.5 Technology

Organon's technology enabler both supports and limits the sharing of knowledge. Knowledge management projects are supported by the company's ICT infrastructure that consists of a broad range of data communication facilities. This infrastructure facilitates communication and connects people with reusable codified knowledge (Lee & Choi, 2003).
Software such as sharepoints and Documentum are used to store data. The biggest advantage of Documentum is that all important knowledge is documented. Disadvantage of this software is the limited access to knowledge. The confidential nature of the information does not allow all information to be shared throughout the company and therefore, it offers limited access.
Sharepoint is a flexible, information sharing and electronic collaboration system. It supports knowledge creation by enabling information access and collaboration processes (Gold et al., 2001; Stonehouse & Pemberton, 1999).

5.1.6 Conclusion

The enabling factors do not contribute to a knowledge management enhancing environment.
Culture as an enabling factor for knowledge management has some strong points, such as the provision of courses, working in teams, and a mentoring program. Nevertheless, the silo culture and the presence of knowledge inhibitors have a negative impact on knowledge sharing, particularly between departments.
The people factor at Organon does not contribute significantly to enhancing knowledge management. Although human networks are an important contributor to KM, these networks suffer from inadequate legitimation and support from the company. Furthermore, the human resource function does not take certain opportunities to use its influence to support knowledge management; HR policies lack incentives for KM activities. The combination of organizational culture and insufficient management attention results in low motivation for employees to actively participate in KM.
Top management appears to be temporarily unable to devote more attention to knowledge management due to other strategic-level priorities. Although, Organon has invested a lot of time and effort to change its organization structure, the beneficial impact on KM appears to be limited. Finally, the technology enabler both supports and limits the sharing of knowledge.

5.2 Knowledge and knowing

Here I will summarise the strengths and weaknesses of the knowledge management practices within Organon.

5.2.1 Strengths

Lessons learned pays attention to both knowing and knowledge

The knowing aspect of knowledge is enhanced by the creation of lessons learned. The emphasis lies on creating moments to reflect on experiences in a project phase. This demands a change in Organon's work attitude. As result, people learn to make time to evaluate their projects.

Furthermore, the knowledge aspect is supported by the lessons learned sessions, as during the sessions personal experience is made explicit and shared throughout the company Making use of this organizational knowledge can prevent the recurrence of mistakes from the past.

Cheops is based on the functioning of human networks

Cheops is an electronic yellow-page directory containing names and competency profiles of company experts. The tool helps employees to find each other by searching on personal data and expertise and enable them to ask questions about any expertise. Understanding that not all knowledge can be documented, Cheops is based on the principle that people use informal human networks to acquire knowledge and support (McDermott & O'Dell, 2001).

The knowledge map promotes a strategic way to manage knowledge within a department

This initiative helps to assess the risk of knowledge loss. It encourages managers to develop a long term view. Managers can anticipate the assessed risks and set up development programs to develop desired skills of the actual workforce.

The CoPs, CoIs and mentoring supports knowing

These measures do not focus on storing knowledge as a possession, but concentrates on social interaction. People are sharing what they know through social interaction. And, as discussed, these successful initiatives demonstrate the potential of KM activities when team members are motivated, and when knowledge sharing is considered not an 'extra' task, but as integral to successful individual and team performance.

5.2.2 Weaknesses

No general job transfer process

The lack of a general job transfer process can lead to situations where knowledge is literally walking out the door. People are leaving their positions, while there is no successor. Here, no interaction between the departing employee and its successor can take place. At the moment, Organon focuses on documenting what it considers to be crucial knowledge, and as a result overlooks the importance of the actual job transfer. We believe it is also an example of how knowledge is only viewed as a resource or asset, while overlooking the processual character of knowing.

All initiatives except for CoP, CoI, and mentoring are not utilized

Although there are a lot of knowledge management initiatives, knowledge management is not really practiced. Many employees do not feel that KM activities and the sharing of knowledge to be part of their ‘real’ jobs, but rather seem them as a distraction. The combination of the organizational culture, low motivation and the lack of management support and attention all contribute to a generally low priority given to knowledge management. We would also point out that knowledge management is an activity that does not necessarily correspond to the presence or absence of formal programs.

For example, Organon benefits from robust and active informal human networks that store, transfer and produce a great deal of crucial knowledge, yet these programs remain informal, and not officially recognized by the company. The point is not that these programs should be formalized, but that when the enablers are in place, knowledge management activities can and do flourish, with or without the label of 'knowledge management'. CoP, CoI, mentoring and human networks are examples of what it means for KM to be integrated in to the culture.

6 Conclusion and recommendations

Overall conclusion: While Organon has invested much time and effort in knowledge management, this is not infused into the organizational culture, and thus the beneficial impact of investment is not optimized.
Knowledge management is not instilled in the organization's culture. People operate under the assumption that crucial knowledge is already being documented and retained, which is in turn based on the view that knowledge exists only as a resource that can be captured and stored. The processual, interactional activities of knowing are overlooked. Since all important data has to be documented for FDA approval, a general belief exists that the use of Documentum is sufficient to retain knowledge—and indeed, for the strictly information components of knowledge this is the case. Though people accept the idea that experiences and human network are important, they believe that this kind of knowledge loss is inevitable. We believe part of this assumption of inevitability is that to date, there has been no discussion or recognition about anything other than the resource aspects of knowledge. The interactional idea of knowing—which is the essence of human networks in operation—has been absent.
Furthermore, the lack of a general job transfer policy and the preconception mentioned above suggest that Organon is only focused on the knowledge-as-resource aspect and overlooking the knowing aspect of the mutually constitutive approach to knowledge and knowing. Most of the knowledge management initiatives have the potential to support the knowing aspect. However, these KM initiatives are not utilized simply because employees in Organon do not perceive the need to actively *practice* knowledge management. In their opinion, knowledge is already being retained. And, they are right—knowledge is retained, but successful knowledge management is more than just the retention or storage of knowledge. Moreover, we believe the current lack of management support can also be at least partially explained by the preconception that the current initiatives, focused mostly on retention, are sufficient.

The organizational culture has influence on other knowledge management enablers.
Culture affects the way other enablers contribute to a 'protected space' for the use—and thereby the creation—of knowledge. Culture and people as knowledge enablers are inextricably linked to each other. Culture is embedded in the way people act, what they expect of each other and how they perceive things. Company policies are made by people whose actions are influenced by culture. The absence of a general job transfer policy, we believe, is a missed opportunity, and demonstrates a focus only on capturing information, without regard for the interactional knowing aspect.
Although the company has changed its organization structure to stimulate collaboration processes, this has had little effect. People will only share their knowledge when there is trust. Literature shows that simply improving the IT infrastructure does not automatically lead to knowledge creation. Although people can now easily communicate with each other, it does not imply knowledge sharing will begin, only because electronic connectivity has been enhanced.

Both organizational culture and management support do not encourage positive knowledge behaviours.
Knowledge sharing can be stimulated by a 'pull' and 'push' strategy. The creation of a 'knowledge-friendly' culture to encourage knowledge sharing can be seen as a 'pull' strategy, while the use of management support can be seen as a 'push' strategy. In Organon, knowledge management is bound to fail when both the organizational culture and the lack of management support do not encourage positive knowledge behaviours.

6.1 Recommendations

Organon has made a significant investment into its knowledge management activities. Unfortunately, however, we believe that despite the large number of initiatives, they still do not seem well integrated into the culture of the company. However, there are bright spots as well, specifically the Mentoring program, CoP, CoI, and the informal human networks—all these are working quite well, and serve as an example of precisely what successful KM looks like when it is truly integrated into the culture. In these examples, knowledge is created, it is then shared, resulting in the creation of still more knowledge. These successful examples also show that successful KM cannot be simply equated with formally designed initiatives, but, when successful, is an emergent, often informal, and more naturally occurring activity.

Organon can however, take steps to create an environment that is more conducive to knowledge management. In the language of our report, this involves using the enablers of KM to create a 'protected space' that allows for and encourages the use of knowledge, which in turn produces knowledge for further use, and so on in an iterative loop, or the reciprocal, generative interplay between knowledge and knowing. More specifically, recommendations for creating this protected space are:

- create awareness for the 'knowing' aspect of knowledge management
- create and ensure a safe environment for employees to share knowledge
- anticipate on future knowledge crisis
- raise support for knowledge sharing

Create awareness for the 'knowing' aspect of knowledge management

Successful knowledge management is not only about the knowledge people have, it is also about what they do with it, the behaviors and activities whereby knowledge is not only used, but produced. Therefore, attention should be paid to the knowing aspect of the mutually constitutive approach to knowledge and knowing by Organon and its management team. People need to be aware that retaining knowledge is *not* just the same as documenting knowledge.

Awareness for the interactional idea of knowing can be created by the implementation of lessons learned. The creation of lessons learned stimulates people to learn and evaluate their actions. Evaluation is very important in the learning process. By stimulating lessons learned, a small culture change can be established.

At Organon, human networks are an important contributor to KM. Based on social interaction, these active informal human networks store, transfer and produce a great deal of crucial knowledge. To make an even stronger contribution, the company should legitimate and support these informal human networks.

Organon has to develop a general job transfer policy. To prevent knowledge walking out the door, this policy should not only focus on documenting knowledge, but also on the importance of the actual job transfer process itself. By paying attention to training and the learning of new tasks, more awareness for the processual character of knowing is raised.

Create and ensure a safe environment for employees to share knowledge

To stimulate knowledge behaviours, Organon can integrate long-term incentives in its evaluation and compensation structure. As reported by employees, the use of the PDD focuses on and encourages individual performance, and does not promote the creation of an environment conducive to collaboration or learning.

The process of knowledge sharing can only take place when the trust level and encouragement for team-level performance goals are high. One way to create trust is to change the evaluation and reward structure to create an open environment specifically incented to encourage knowledge sharing.

Anticipate future knowledge crises

To anticipate and address future knowledge loss, Organon has introduced a succession management policy. The purpose of this policy is to create a pool of candidates with high

leadership potential to replace the loss of any key person. By applying this policy to lower-level staff, the company can increase the benefits of its succession management policy. Also engaging retired employees as consultants is a good alternative to prevent or slow down the loss of crucial knowledge.
Furthermore, the knowledge map creates awareness for knowledge management in general; it stimulates managers to develop a strategic view to manage knowledge.

Raise support for knowledge sharing
Finally, all of this can not be done without the support of 'knowledge management believers' within Organon. More KM champions should be recruited to actively promote and stimulate knowledge sharing activities. These activities can have a beneficial effect on overall KM effectiveness.

Appendix 1 Research Material

Data source		Method
Person:		
	Global Human Resource Development (GHRD) manager (1)	Open interview
	Global Learning Center (GLC) manager (1)	Open interview
	Human Resource (HR) manager (2)	Open interview
	Knowledge manager (1)	Open interview
	Livial Global Venture Team (GVT) members (6)	Semi-structured interview
Media:		
	Internet	Content analysis
	Intranet	Content analysis
Documents:		
	Company documents	Content analysis
Literature:		
	Knowledge management	Content analysis
	Organizational learning	Content analysis

Appendix 2 Research Instrument

The research instrument used during the field study consists of questions, which are grouped in four categories.

General questions

The first category of questions concerns the function of the team member within the team.

- What is your function in the team?
- What are the activities of your function?
- What are your responsibilities?

The purpose of these questions is to create a better insight in the processes which take place in the Livial GVT. The answers to these questions will also be used to position the team member within the team.

Knowledge

The second category discusses the knowledge available within the Livial GVT and its characteristics.

- What kind of knowledge is available within the Livial team?
- What kind of knowledge is crucial to the Livial team?
- What are the risks and impact for the Livial team/ Organon when this knowledge is lost?

These questions are used to get an impression of what kind of knowledge is available within the Livial GVT and how crucial this knowledge is.

To create a better view of what sort of knowledge it concerns, the following questions will be asked:

- To what extent is knowledge codified within Livial GVT?
- What kind of knowledge is codified?

Knowledge can be explicit or tacit. Explict/ codified knowledge is knowledge which can be expressed in language, drawings or schemes.

- What kind of knowledge is tacit within Livial GVT?

Tacit knowledge is personal knowledge which is hard to formalise and therefore difficult to share with others. Experiences, skills, attitude and networks fall under this category.

- To what extent do you use your current network to gain knowledge?
- For what purpose do you use your network?

In the pharmaceutical industry external and internal networks are very useful to acquire knowledge.

- Can you tell which member of Livial GVT has crucial knowledge and what kind of knowledge this is?

The purpose of this question is to let team members point out the importance of certain members within the team regarding to knowledge.

Current knowledge management practices
The next category of questions handles the current knowledge management practices within Livial GVT.

- How is knowledge managed within the team? In what way is knowledge transferred, shared, communicated?

Explicit knowledge can be documented and shared through software systems. Tacit knowledge on the other hand is hard to capture and to share.

- Is the knowledge of the Livial team accessible for everybody? If not, what are the restrictions?

Knowledge crucial to the Livial GVT can also be usefull to other Global Venture Teams.

- When knowledge is documented, is it also easy to retrieve this knowledge?

Although crucial knowledge is documented, it should also be retrievable.

- Are the measures taken to retain and transfer knowledge sufficient? If not, what is lacking?

The team members are very aware of the flaws of the current knowledge management measures.

Future of Livial
The last category focusses on the knowledge management processes which are needed before the dissolution of the Livial GVT.

- Since Livial GVT will be dissolved within a short term, what measures are now taken to retain and transfer knowledge?
- To whom will this knowledge be transferred and what kind of knowledge is this?

It is of great importance to find out how the transfer of the responsibilities and knowledge of the Livial GVT to other departments will happen.

- All the knowledge needed for the registration is documented, but what happens when the market requests information which is not documented?
- To answer these questions, you need knowledge and expertise of Livial and how can you find this?

The purpose of these questions is to figure out what will happen when codified knowledge is not enough to cover the information need.

- Have people with crucial knowledge already left the team?
- How is their knowledge retained and/ or transferred to other team members?
- Is here a matter of lost knowledge? If so, what kind of impact does this have for the team/ organisation?

The above mentioned questions are to assess the consequences of the departure of team members and also how knowledge management is practiced in reality.

- Do you have some suggestions to improve the retention and transfer of knowledge?

To conclude the interview and to stimulate involvement of the team member to this research, this question is posed to ask for personal input of the interviewee.

Appendix 3 Organon Workforce Statistics

Workforce by sector

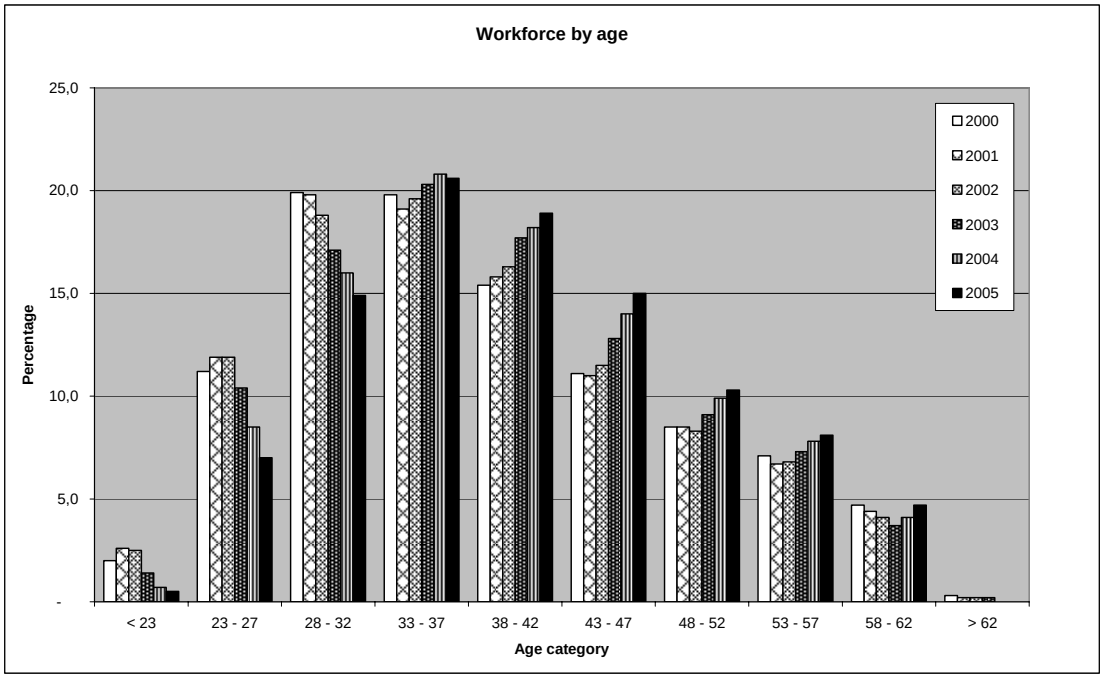
Sector	2003	2004	2005
Local staff department	922	919	901
International staff department	449	426	508
Pharmaceutical operations	998	966	989
R&D Oss	1236	1241	1226
Active Pharmaceutical Ingredients (API)	1096	952	931
Biotechnology	264	274	291
Organon Netherlands	125	114	95
Working Abroad	43	42	56
Total workforce	**5133**	**4934**	**4997**

After a period of decreasing workforce, we see a slight increase of employees in 2005. The increase of the international staff can be ascribed to a shift of local staff and R&D to the international staff department.
The workforce by sector is only available for the year 2003, 2004, and 2005. Due to the reorganization in 2001 and 2002, it is not possible to provide accurate figures for these years.

Age profile

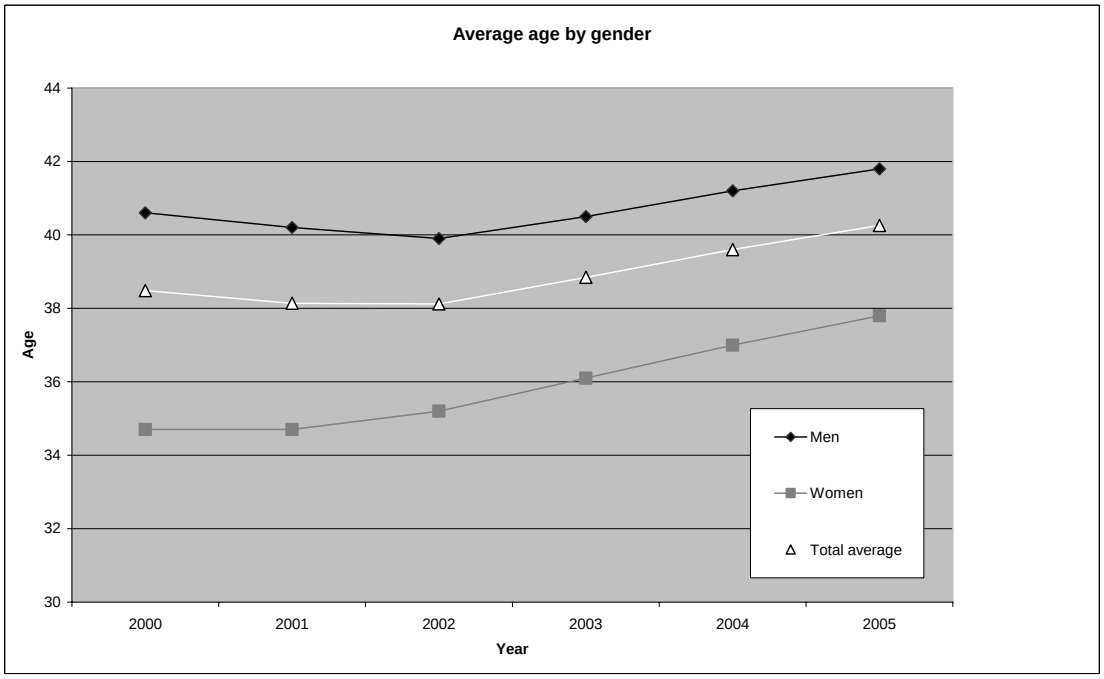
Age category (%)	2000	2001	2002	2003	2004	2005
< 23	2,0	2,6	2,5	1,4	0,7	0,5
23 - 27	11,2	11,9	11,9	10,4	8,5	7,0
28 - 32	19,9	19,8	18,8	17,1	16,0	14,9
33 - 37	19,8	19,1	19,6	20,3	20,8	20,6
38 - 42	15,4	15,8	16,3	17,7	18,2	18,9
43 - 47	11,1	11,0	11,5	12,8	14,0	15,0
48 - 52	8,5	8,5	8,3	9,1	9,9	10,3
53 - 57	7,1	6,7	6,8	7,3	7,8	8,1
58 - 62	4,7	4,4	4,1	3,7	4,1	4,7
> 62	0,3	0,2	0,2	0,2	-	-
Total %	100	100	100	100	100	100
Total workforce	**4282**	**4921**	**5340**	**5133**	**4934**	**4997**

The limited recruitment of the last few years has significant effect on the age structure. The percentage of employees < 38 year has decreased further (49.2% in 2003; 46.0% in 2004; 43.0% in 2005).



Average age Organon employees

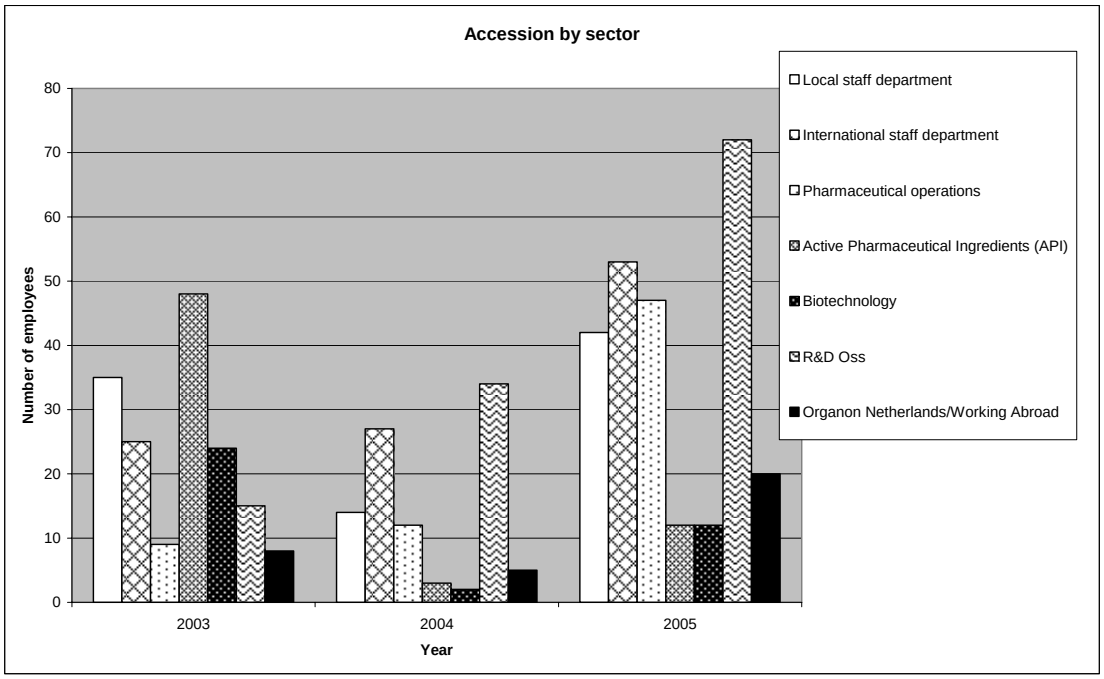
As a result of a limited recruitment the average age of the employees has increased to 40.3 year. That comes down to an increase of 2.2 years within a period of five years.



Accession by sector

Sector	2003	2004	2005
Local staff department	35	14	42
International staff department	25	27	53
Pharmaceutical operations	9	12	47
Active Pharmaceutical Ingredients (API)	48	3	12
Biotechnology	24	2	12
R&D Oss	15	34	72
Organon Netherlands/Working Abroad	8	5	20
Total accession	**164**	**97**	**258**

In 2005, the total number of employees recruited is increased to 258. Most of the accessions have taken place in the R&D sector.



Separation by sector

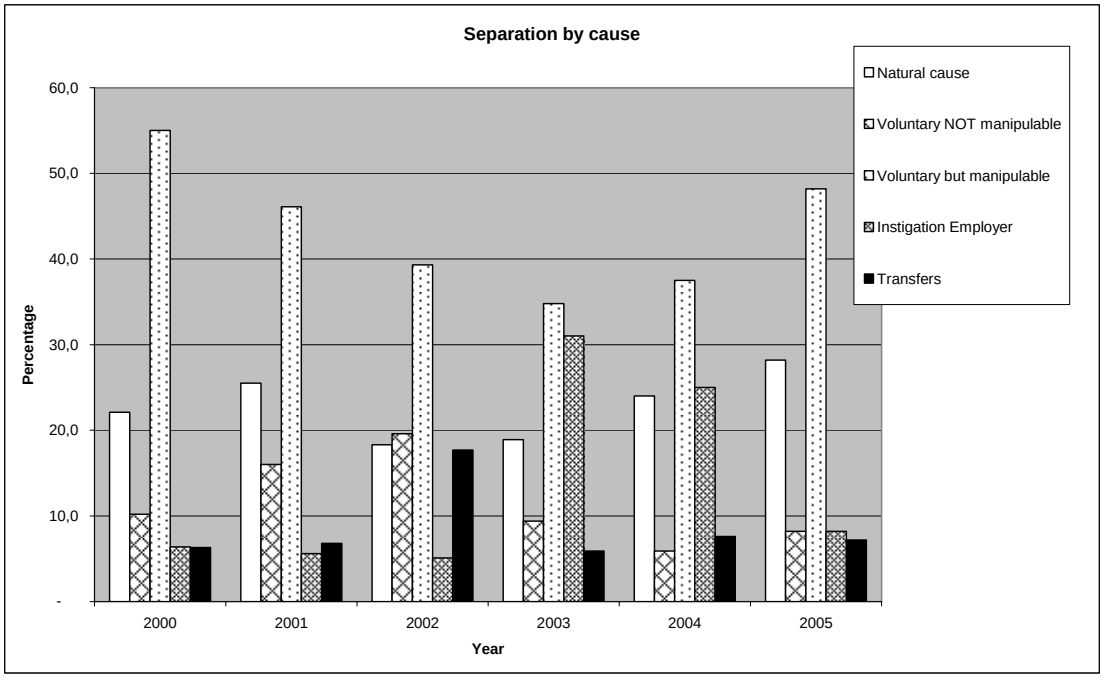
Sector	2003	2004	2005
Local staff department	59	70	32
International staff department	49	41	35
Pharmaceutical operations	85	37	25
Active Pharmaceutical Ingredients (API)	44	76	35
Biotechnology	15	29	4
R&D Oss	103	38	44
Organon Netherlands/Working Abroad	16	13	20
Total separation	**371**	**304**	**195**
Total workforce	5133	4934	4997
Turnover (%)	**7,2**	**6,2**	**3,9**

The reorganization in 2003 and 2004 resulted in a high turnover. This process completed in the beginning of 2005. In 2005, only 195 employees have left the company.

Separation by cause

Turnover cause (%)	2000	2001	2002	2003	2004	2005
Natural cause	22,1	25,5	18,3	18,9	24,0	28,2
Voluntary NOT manipulable	10,2	16,0	19,6	9,4	5,9	8,2
Voluntary but manipulable	55,0	46,1	39,3	34,8	37,5	48,2
Instigation employer*	6,4	5,6	5,1	31,0	25,0	8,2
Transfers	6,3	6,8	17,7	5,9	7,6	7,2
Total %	100	100	100	100	100	100
Total separation	**285**	**306**	**316**	**371**	**304**	**195**

Natural cause: retirement, decease, long term sickness
Voluntary NOT manipulable: termination of temporary contract, other reasons
Voluntary but manipulable: promotion elsewhere, resignation on personal request
Instigation employer: employer initiated termination
* Including termination of temporary contracts due to reorganization in 2003 and 2004.



Internal transfer

	2000	2001	2002	2003	2004	2005
Internal transfer	329	358	304	291	429	373
Total workforce	4282	4921	5340	5133	4934	4997
Internal transfer/workforce (%)	7,7	7,3	5,7	5,7	8,7	7,5

After an increase in 2004, the total internal transfers decreased to 7.5% of the total workforce.

Mobility

Sector	2004	2005
Local staff department	34	20
International staff department	19	27
Pharmaceutical operations	62	67
Active Pharmaceutical Ingredients (API)	92	55
Biotechnology	19	17
R&D Oss	68	28
Total (A)	**294**	**214**

Internal transfer to different sector	2004	2005
From Local staff dep. To International staff dep.	6	6
From Local staff dep. To Pharm. operations	5	1
From Local staff dep. To API	2	6
From Local staff dep. To Biotechnology	3	1
From Local staff dep. To R&D Oss	1	2
From International staff dep. To Local staff dep.	7	7
From International staff dep. To Pharm. Operations	3	6
From International staff dep. To API	0	3
From International staff dep. To Biotechnology	0	1
From International staff dep. To R&D Oss	14	4
From Pharm. operations To Local staff dep.	2	7
From Pharm. operations To International staff dep.	2	4
From Pharm. operations To API	0	16
From Pharm. operations To Biotechnology	0	1
From Pharm. operations To R&D Oss	16	12
From API To Local staff dep.	8	6
From API To International staff dep.	0	2
From API To Pharm. Operations	0	14
From API To Biotechnology	29	21
From API To R&D Oss	0	3
From Biotechnology To Local staff dep.	1	0
From Biotechnology To International staff dep.	0	2
From Biotechnology To Pharm. Operations	0	2
From Biotechnology To API	8	9
From R&D Oss To Local staff dep.	9	2
From R&D Oss To International staff dep.	16	17
From R&D Oss To Pharm. Operations	3	3
From R&D Oss To API	0	1
Total (B)	**135**	**159**

Transfer between Organon and Akzo Nobel	2004	2005
From Organon To Akzo Nobel	17	22
From Akzo Nobel to Organon	21	11
Total (C)	**38**	**33**

Total (A to C)	**467**	**406**

Vacancy 2000 – 2005

	2000	2001	2002	2003	2004	2005
Open vacancy previous year	0	155	208	13	51	150
Approved vacancy	962	1179	979	253	442	604
Total vacancy	962	1334	1187	266	493	754
Vacancy filled	788	1117	1084	179	284	416
Vacancy canceled	19	9	90	36	59	49
Open vacancy end of year	155	208	13	51	150	289

Organon faces a vacancy growth in 2005 after a recess in 2003. The growth of vacancies has also led to an increase of accessions.

Sick leave

	2000	2001	2002	2003	2004	2005
Sick leave (%)	4,2	4,3	4,5	4,6	4,6	4,5

Despite the slight decrease of the sick leave percentage in 2005, the rate between sick leaves and the total workforce is still high.

Sick leave by sector

Sector (%)	2005
Local staff department	5,0
International staff department	3,3
Pharmaceutical operations	6,1
Active Pharmaceutical Ingredients (API)	4,7
Biotechnology	5,4
R&D Oss	3,2
Organon Netherlands/Working Abroad	3,4
Total sick leave	**4,5**

Within the sectors, Pharmaceutical operations have the highest sick leave percentage of 6.1%.

Internal and external education

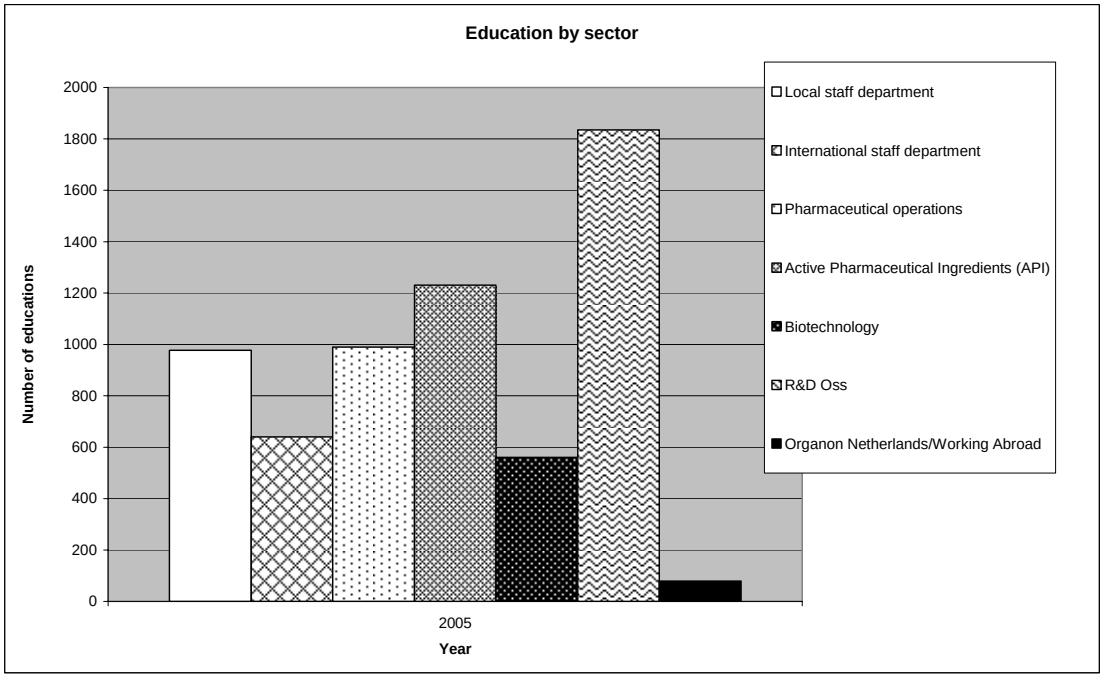
Education	2003	2004	2005
Management training/social skills	1271	1942	1434
Technical/Scientific	7028	4113	4382
Introduction	135	114	188
Rest	505	288	307
Total education	**8939**	**6457**	**6311**
Total workforce	**5133**	**4934**	**4997**

In 2003, increase of courses followed is caused by extra courses on the field of management training/ social skills, and technical/ scientific skills.
In 2004, the R&D training program ‘Working with competences’ has caused an increase of education courses taken.

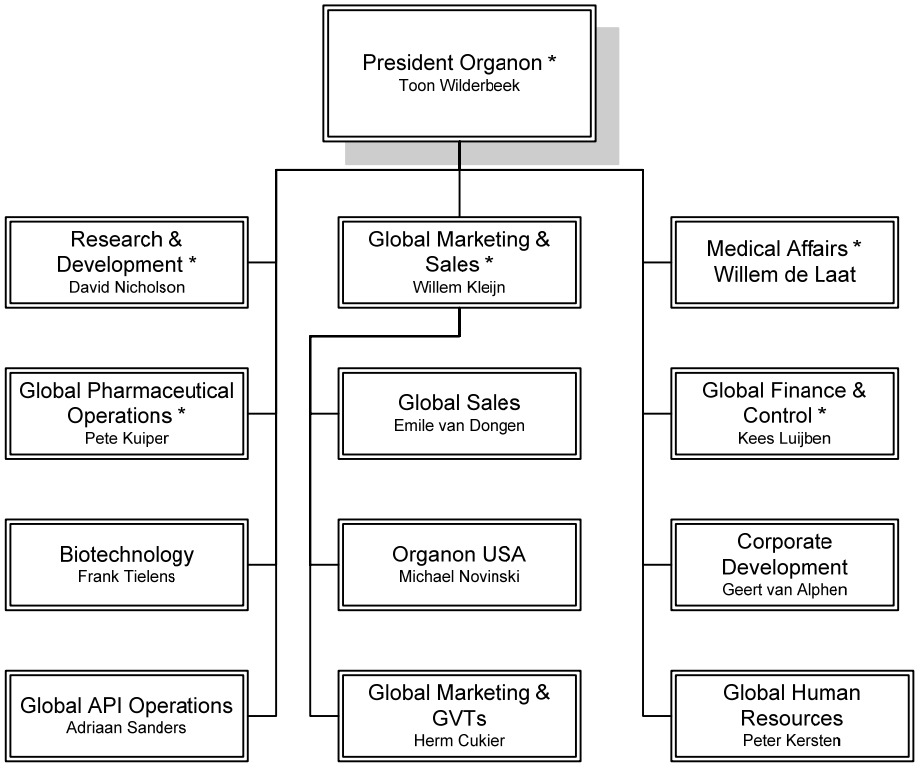
Education by sector

Sector	2005
Local staff department	977
International staff department	640
Pharmaceutical operations	990
Active Pharmaceutical Ingredients (API)	1230
Biotechnology	560
R&D Oss	1835
Organon Netherlands/Working Abroad	79
Total education	**6311**

Compared to other sectors, most courses are taken by the R&D sector in Oss.



Appendix 4 Organization Chart Organon



* Member of the Executive Committee Organon

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