2011
2012

BEDRIJFSECONOMISCHE WETENSCHAPPEN

master in de toegepaste economische wetenschappen:
innovatie en ondernemerschap

Masterproef

The use of open innovation in corporate renewal

Promotor :
Prof. dr. Wim VANHAVERBEKE

Copromotor :
dr. Anna ROIJAKKERS

Thomas Heselmans

Masterproef voorgedragen tot het bekomen van de graad van master in de toegepaste economische wetenschappen , afstudeerrichting innovatie en ondernemerschap

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Summary

The aim of this master thesis is to investigate whether Open Innovation can be used in Corporate Renewal. Above all, I chose this subject as an extension of my studies. Secondly, I chose this subject because in today's business environment it has become the most important strategic focus. Thirdly, I saw it as a challenge to contribute to a subject with little or no research.

In the first part of this thesis I started with introducing the **problem definition**. In todays economy we can see that shorter product lifecycles, higher development costs for new products, increasing time pressure for commercialization and the mobility of knowledge workers force companies to change the way in which they practice innovation. Moreover, we can see the need for a company to grow and to create value by developing and commercializing new or improved products and businesses. Because of these changes in the economical environment, companies are pushed to implement a new Innovation model namely Open Innovation. In order to stay innovative, companies do not only need to reinvent their current products, they also have to reinvent their business as a whole. In order to do this companies are using Corporate Renewal. But there aren't any companies that are combining these two concepts to change their business by using Open Innovation. Starting from this discovery I formulated the central research question:

"How can companies use Open Innovation in Corporate Renewal?"

In the second part of this thesis, the **literature research**, I consulted the existing literature. This literature research was conducted in chapters two and three.

In chapter two, my master thesis covers the different topics related to innovation. I started by explaining Innovation and Closed Innovation followed by Open Innovation. As a starting point, I used the book "*Open Innovation: the new imperative for creating and profiting from technology*" of Henry Chesbrough from 2003 where he argues that by using Open Innovation firms should no longer only make use of the knowledge that is located internally in the company, but should also make use of technology from external sources. Afterwards I discussed the evolution towards an open business model to enhance the cooperation with outside partners. To conclude this chapter I compared the Closed Innovation model with the Open Innovation model. As I wanted to investigate Open Innovation in Corporate Renewal, I introduced Corporate Renewal in

chapter three. In this chapter I discussed the difference between exploration and exploitation and I linked these two concepts with innovation in the running businesses and innovation in Emerging Business Areas.

The **case studies** will be performed in the third part of this thesis. By conducting my literature study I found out that there is little or no research done about Open Innovation in Corporate Renewal. That is why I have chosen to conduct two case studies in cooperation with DSM and Janssen Pharmaceutica. Both companies already use Open Innovation in their running business and they were pioneers for using Open Innovation in Corporate Renewal. These case studies will be discussed in detail in chapters four and five. With two case studies and the already existing literature, I was able to generate a broad view on the use of Open Innovation in Corporate Renewal.

In chapters six, I compared the two case studies of DSM and Janssen Pharmaceutica. By conducting this comparison I identified that both companies are using Open Innovation in Corporate Renewal but they are using different methods to reach their goal. The second section described the changes that have to be made in the Open Innovation model to use it in Corporate Renewal. These changes were discovered by comparing the case studies with the theory from chapter two and three. In this section I argue that four changes have to be made in the Open Innovation model. The first change I discovered is the increasing importance of an innovation network in Corporate Renewal. A second change is the cooperation with other and more distant partners compared with cooperations in the running businesses. This also implies a third change, namely that a different scope of partners should be constructed. The fourth, and most important, change in the Open Innovation model is the change from a product development innovation to a competence building innovation. In the third section, I was able to construct a new framework that enables the use of Open Innovation in Corporate Renewal. First of all, we can see that a company should have a well-structured strategy discussion within the company. This will enhance the discovery of Emerging Business Areas and will increase the acceptance of change through the company. Secondly, I identified the need of an Innovation Center. An Innovation Center will give Emerging Business Areas more time to be developed and an Innovation Center has the possibility to be subtracted from the financial statements of the company. Thirdly, I found out that the Innovation funnel has to change for using Open Innovation in Corporate Renewal. The first change is the division into three separate phases. Because in Corporate Renewal, companies still need to build the necessary competences we can see that companies should focus on the front-end of

the innovation funnel rather then the middle or the end of the Innovation funnel. After building the necessary competences, a company can proceed into the second and third phase that are more focused on development and commercialization. A second change is the connection to new and more distant partners. In Corporate Renewal I identified that a company is focusing on Emerging Business Areas and this implies that they will have to look outside their current value chain.

Afterwards, I discussed the business model that should be used by the Innovation Center. Because connection with partners is more important in Emerging Business Areas then in the running businesses, a company should use a more open business model. This will enhance cooperation and the transfer of Intellectual Property. In this section I used the theory provided by Henry Chesbrough in his book: *"Open business models: How to thrive in the innovation landscape"* of 2006. After this, I discussed the management team that should be used to manage Emerging Business Areas or Areas of Interest. Because of the high uncertainty of an Emerging Business Area I identified that an experienced management team should be composed. This means that the management team of an Emerging Business Area should already have managed a business unit and a business group. At the end of chapter six I constructed new Intellectual Property management guidelines to enhance the cooperation with partners. These guidelines are focused on long-term cooperation with research centers and universities.

To end this thesis, I provided the reader with the most important **conclusions and recommendations** in the fourth part of this thesis. In chapter seven, I concluded that Open Innovation is the most suitable innovation model to be used in Corporate Renewal. Afterwards I focused on the most important changes for a company. The first one is the changing innovation funnel. This model is more directed towards the first phase of the innovation funnel. A second change in the innovation model is the use of a different business model and the last change is the change of Intellectual Property management.

Foreword

In creating this master thesis I didn't only use my own knowledge but I managed to implement knowledge from experts in the field. First, I want to thank my thesis promoter Professor Doctor Wim Vanhaverbeke for the constant support and help given during this thesis. Secondly, I want to thank the people that contributed with their professional insights in the case study: Rob Kirschbaum, Jos Put and Hein Schreuder of DSM and Eric Snoeckx and Tom Aelbrecht of Janssen Pharmaceutica. Last but not least I want to thank my fellow students, my parents and my brother for the moral support and constant guidance during this master thesis.

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Part 1: Problem definition and methodology

Chapter 1: Introduction and problem Definition

The purpose of this first chapter is to present the reader the necessity of the subject of this master thesis. In order to do this I will use to following structure: (1) introduction of the problem definition (2) the aim of this thesis (3) central research question and research sub-questions (4) research methods and (5) the structure of the chapters in this thesis.

1.1. Introduction and Problem definition

In our rapid changing economy where companies are pushed to develop new and better products, the speed for developing and introducing these products has decreased rapidly during the last ten to twenty years. This results in the need for companies to find new ways in which, they not only introduce new products but also renew and redevelop their current products.

In the 20th century, companies generated and developed ideas purely by using their internal R&D department. This was called "the closed innovation-model". Because of a changing economic environment companies cannot attain a satisfying return from this technological innovation anymore. This resulted in a decrease of innovative ideas produced by the R&D department. Companies lost a lot of money from their investments and a change had to be made.

In 2003, Henry Chesbrough used the term "Open Innovation" as a reaction to this changing environment. He illustrated companies that they should open up their business model to collaborate with technologies or ideas generated by other companies. Because of the successes reached by using this new innovation model, companies started using this innovation model. Companies like Apple, IBM or Proctor & Gamble proved by various products that this new model can be successful.

In order to stay innovative, companies do not only need to reinvent their current products, they also have to reinvent their business model and competences. This means that companies should ask themselves the question: "What new products or competences do we need to attract in the company to continue our competitive advantage?" To answer this question, academics and companies developed a concept that would help them: 'Corporate Renewal'. This means rethinking your strategy, your

company's vision and your product scope. If companies are able to do this process efficiently a competitive advantage can be attained for years to come.

Today, companies aren't only looking for a new innovation model to cooperate better with other companies or for reinventing their company to attain a competitive advantage. Companies are now looking for the possibility of combining these two successful concepts to attain a competitive advantage. By doing this, companies are not only looking for a possibility to innovate their current products but also to innovate their business model to attain new success.

1.2. Aim of this thesis

In this master thesis, I will investigate whether the Open Innovation model can be used to implement Corporate Renewal. In this effort I will try to answer the question: "Can we use open collaboration with outside partners to change our current scope of products or competences?" Following this question I will investigate what changes need to be made to use the Open Innovation-model for Corporate Renewal.

In order to use Open Innovation efficiently companies had to change their closed business model into an open business model. This meant that companies had to open up their boundaries to attract outside partners. In this thesis I will try to answer the question: "Which business model do we need to develop to successfully use Open Innovation for Corporate Renewal?"

The last purpose of this thesis is to prove the benefits that can be attained by this new framework. In order to do so I will cooperate with two companies that use Open Innovation for Corporate Renewal, namely DSM and Janssen Pharmaceutica.

1.3. Research Questions

A study of the economical environment proves that there is a need for a new way to do business and to be innovative. Starting from this discovery, I formulated the following central research question:

"How can companies use Open Innovation for Corporate Renewal?"

I chose this question because, as explained in the problem definition, it's important to identify whether Open Innovation can be used in Corporate Renewal and not only for introducing new products in their current businesses. Starting from this question I also want to investigate if the Open Innovation model should be modified to be used in a Corporate Renewal process. The central research question obliges me to investigate which business model should be developed to practice Open Innovation in Corporate Renewal.

To be able to answer the central research question I have formulated ten research sub-questions. These questions have the purpose to help me in my investigation for the central research question:

- What is Innovation?
- What is Open Innovation?
- How do DSM and Janssen Pharmaceutica use Open Innovation?
- What is Corporate Renewal?
- How is Corporate Renewal deployed in companies?
- "Can companies use Open Innovation in Corporate Renewal?"
- "How can companies use Open Innovation in Corporate Renewal?"
- "What do we need to change in the Open Innovation model to use it in Corporate Renewal?"
- "How should firms transform a business model to enhance the connection to outside partners in Open Innovation?"
- "How do firms have to manage Intellectual Propery for using Open Innovation for Corporate Renewal?"

1.4. Research methods

To start my thesis, I have conducted a study of the available literature. I used the research sub-questions to get a good understanding of the definition and terminology used within Open Innovation and Corporate Renewal. This research is done by consulting publications using the library of the University of Hasselt and KU Leuven, the library of Hasselt and the Internet. I also consulted databases of management journals using the digital library of the University of Hasselt. The following is an outline of the different sources I used to conduct this search of literature:

- EBSCO Host

Business Source Premier Academic Search Elite
If have searched this database by using the following keywords: Innovation, Open Innovation, Open business models and Corporate Renewal, core competences, Henry Chesbrough, Wim Vanhaverbeke and a combination of these keywords.

- Google Scholar

This database was consulted by using the following keywords: Innovation, Open Innovation, Corporate Renewal, Core Competences, Strategic Renewal, Open business models, Henry Chesbrough, Wim Vanhaverbeke and a combination of these keywords.

- SI Web of Knowledge-database

This database was used for an extra search if EBSCO host or Google Scholar didn't have sufficient matches.

As the purpose was to have an overview of all relevant research this method proved to be very effective. I was able to come in contact with books, articles and opinions about different subjects. This provided me with a complete understanding of the concepts that would be used in this master thesis. The most articles and books that were found during this literature study were written by Dr. Henry Chesbrough and Professor Dr. Wim Vanhaverbeke. Dr. Henry Chesbrough was the first academic to use the term Open Innovation in 2003.

Most of the articles were published by academic and business oriented journals: Academy of Management Perspectives, California Management Review, Harvard Business Review, McKinsey Quarterly, Sloan Management Review, Research-Technology Management.

This literature research has been done until the very end of the master thesis. This results in incorporation of the most recent articles and information until the end of this research.

I also opted to use case studies in this thesis. I did this by interviewing two companies (DSM and Janssen Pharmaceutica) that have been using Open Innovation in their business model. I have also chosen to use articles in which case studies were used. By doing this I want to make this thesis useful for companies that want to transform their business by using Open Innovation.

1.5. Structure of the thesis

In order to give a broad understanding of the different concepts used in this thesis, I will start with an overview of the different concepts used in the thesis namely innovation, closed innovation and Open Innovation. Afterwards I will elaborate on the use of an open business model in Open Innovation and which elements in a firm's business model should be changed to use Open Innovation effectively. I will end this chapter with a comparison between open and closed innovation to provide the reader with a complete overview of the past innovation framework and the innovation framework that is used today.

In chapter three, I will first explain the concept of Corporate Renewal followed by its processes. After this I will go into detail on how companies can deploy Corporate Renewal at the business and the corporate level. In the fourth section I will explain competences building in Corporate Renewal. To end the chapter I will explain the main approaches of Corporate Renewal followed by the link between Corporate Renewal and Open Innovation. By providing the first two chapters I want to introduce the two major concepts that will be used in this thesis. It's essential to understand these concepts before providing chapter four and five.

In chapter four and five I will introduce two companies that use Open Innovation in their Corporate Renewal process. In chapter four I will start with DSM. First I will go into detail on the history of DSM and the transformation of its strategy in the last decade. Afterwards I will examine how DSM practices Corporate Renewal with special attention to the Strategic Process within DSM. In the third section I will discuss the Innovation efforts of DSM and the creation of the DSM Innovation Center. Afterwards I will discuss the difference between Open Innovation in the running business and innovation in the DSM Innovation Center. In the fifth section, I will go into detail on the creation and the management of the Emerging Business Areas (EBA's) Bio-Based Products & Services, Bio-Medical and DSM Advanced Surfaces within the DSM Open Innovation Center. To end this chapter, I will provide the reader with a short conclusion.

In chapter five I will examine the case of Janssen Pharmaceutica. Because Open Innovation is only recently introduced in this company, I will start by introducing the story of Janssen Pharmaceutica with their strategic transformation in 2008. Afterwards

I will elaborate on the creation of the Janssen Campus Office. Next to that, I will look into the business model used for innovation within the running businesses and the business model used for innovation at the Janssen Campus Office. Afterwards, I will examine how Janssen Pharmaceutica uses Open Innovation in Corporate Renewal with attention to the management of this process and the use of a Venture Capital department for funding internally and externally generated ideas. To end this chapter I will provide the reader with a short conclusion.

In chapter six I will try to create a framework for using Open Innovation in Corporate Renewal. First of all, I will answer the question if Open Innovation can be used in Corporate Renewal. Afterwards I will go into detail on the changes that have to be made in Open Innovation to use it in Corporate Renewal. In the third section, I will compare the processes and the management at DSM and Janssen Pharmaceutica. In the fourth section, I will create a framework of best practices by using the case studies in chapter four and five. In this framework, I will first start with the strategy processes that should start the use of Open Innovation in Corporate Renewal. Afterwards, I will explain the need of an Innovation Center to enhance the development of Emerging Business Areas or Areas of Interest. In the third section I will construct a new innovation funnel, followed by explaining the difference in partners between Open Innovation in running businesses and Open Innovation in Corporate Renewal. In the fifth section I will go into detail in the business model that should be used by the Innovation Center. After this, I will look into the management team that should be used to manage Emerging Business Areas or Areas of Interest. To end this chapter I will try to construct a new organization of Intellectual Property management to enhances the cooperation with partners.

In chapter seven I will provide the reader with a short conclusion of this thesis followed by some recommendations. In the conclusion I will focus on the need of a different strategy, different management and a different Open Innovation approach for Emerging Business Areas.

To end this thesis I will provide a list of figures, the persons interviewed and a bibliography.

Part 2: Literature Research

Chapter 2: Innovation

In this second chapter I will provide the reader with a summary of the concept of innovation. In order to provide a comprehensive understanding of this concept I will start by giving the definitions of innovation, closed innovation and Open Innovation. Afterwards, I will go into detail on the importance of a business model in a company. In this section, I will discuss the functions of a business model followed by the different types of business models. Afterwards I will provide some reasons why business models are changing and the evolution towards a more open business mode. To conclude this chapter I will make a comparison between closed and Open Innovation. By providing this comparison I want to give the reader the differences in processes between the two models.

2.1. Definitions

2.1.1. Innovation

Innovation has a lot of different meanings and this results in different definitions. By scanning available literature I have been in contact with a lot of those definitions. I have selected the following definition as the most complete:

> *The term innovation means a new way of doing something. It may refer to incremental, radical, and revolutionary changes in thinking, products, processes, or organizations. A distinction is typically made between invention, an idea made manifest, and innovation, ideas applied successfully.* (McKeown, 2008)

Schumpeter (1934) identifies two major categories of innovation namely Product and Process innovation. Product innovation is 'the creation of a new good which more adequately satisfies existing or previously satisfied needs' (Schumpeter, 1934). Thus product innovation is the invention and creation of new products.

Process innovation substitutes 'a production or consumption good by another, which serves the same or approximately the same purpose, but is cheaper" (Schumpeter, 1934). According to Schumpeter, process innovation includes introducing new

materials or supplies, and new methods that could make the production of a unit or a product cheaper (Schumpeter, 1934).

If we look more into detail to Schumpeter's (1934) framework, we can see that he subdivides those two categories in the following five types of innovation:

"Process innovation:

- A new method of production,
- A new source of supply of raw material or semi-finished goods,

Product innovations:

- A new good,
- A new quality of a good, opening a new market,
- A new industry structure as the creation or destruction of a monopoly position (Meier and Baldwin, 1957)."

Source: Schumpeter (1934)

From this subdivision and the definition of innovation we can conclude that innovation is a necessity for companies that want to move forward. In our current economy, companies that aren't innovative will lose market share to their competitors and will in the long term go bankrupt.

As can be derived from the definition, innovation is used to create a competitive advantage. By developing new products or processes a company can enforce in the short term a 'first mover advantage' and it can introduce a new product- or technology standard to the market. In the long term the company is able to profit for years from its early technology development.

To summarize it is clear that innovation is essentially for companies that want to move forward and want to create a competitive advantage over competition. Innovation is able to create significant benefits in the short term as well as the long term.

2.1.2. Closed Innovation

After explaining the concept of innovation I will, in the following sections, go into detail how companies can be innovative. To provide the reader with a better understanding of the terminology and processes of Open Innovation, I will introduce the first innovation model: "Closed Innovation".
Chesbrough (2003) defined Closed Innovation as followed:

Closed Innovation ... is a view that says successful innovation requires control. Companies must generate their own ideas and then develop them, build them, market them, distribute them, service them, finance them, and support them on their own. This paradigm counsels firms to be strongly self-reliant, because one cannot be sure of the quality, availability, and capability of others' ideas: "If you want something done right, you've got to do it yourself." (Chesbrough, 2003, p. xx)

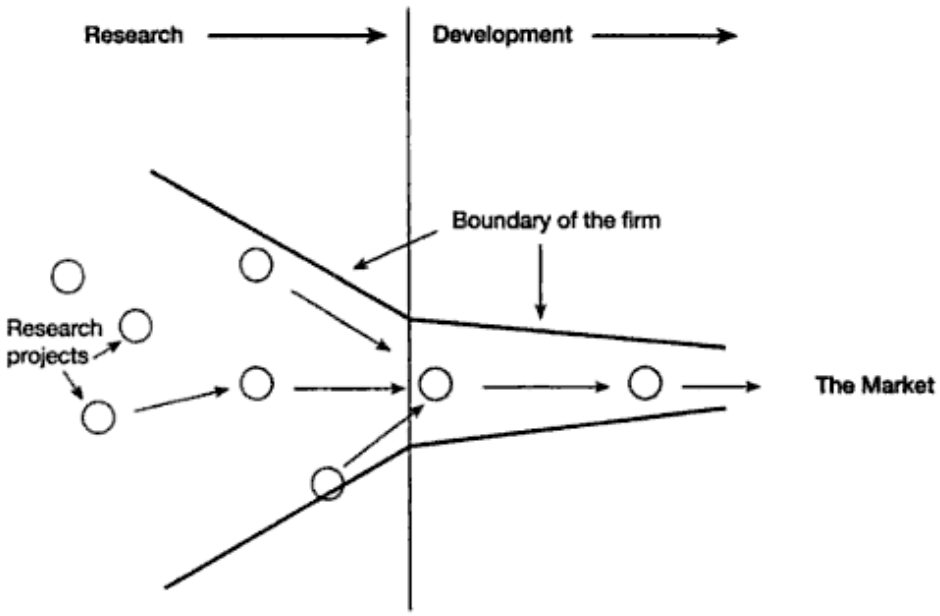

FIGURE 1: CLOSED INNOVATION MODEL

Source: Open Innovation: the new imperative for creating and profiting from technology, Chesbrough H, (2003)

In figure 1 the closed innovation model is shown. As presented in figure 1, the organization has set boundaries that prohibit the influence of external ideas. In this model the organization is separated from the market.

In a closed innovation model a company uses only its internal R&D department to develop new ideas and products. These R&D centers were viewed as an asset for the company and even an entry barrier for potential competitors. By hiring all relevant knowledge, companies were able to develop the most innovative ideas and products. As a lot of investment had to be done in the R&D department only international companies like IBM, Microsoft, Intel, AT&T, etc. were able to hire this specific knowledge. As a result only those companies were able to bring the best and most innovative products on the market, which made the biggest companies even bigger and more powerful.

Chesbrough identified in his book "Open Innovation: The New Imperative for creating and profiting from technology" that the logic and processes of the Closed Innovation model created a virtuous circle. This circle is presented in figure 2.

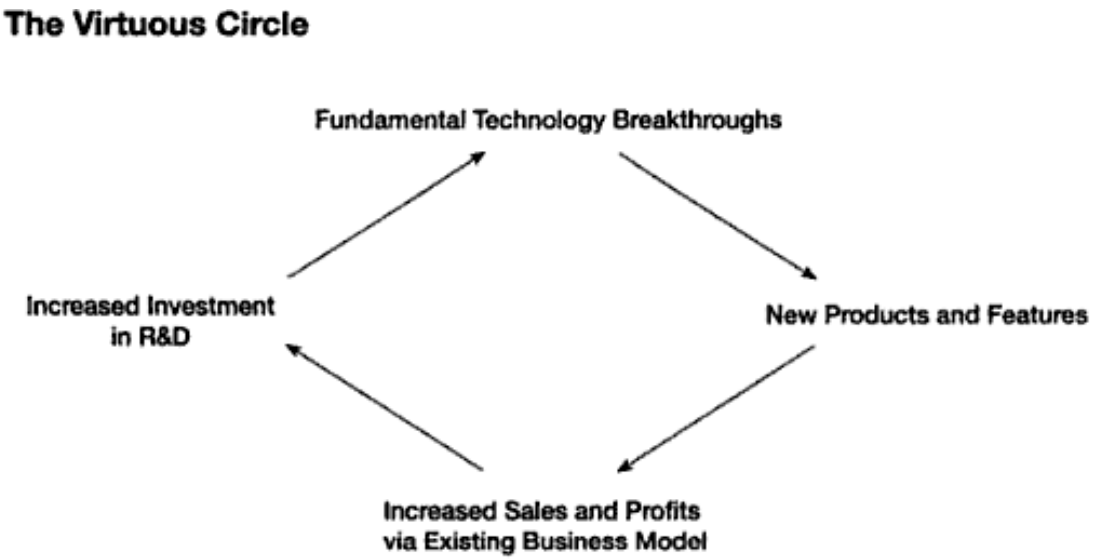

FIGURE 2: THE VIRTUOUS CIRCLE

Source: Open Innovation: The New Imperative for Creating and Profiting from Technology (2003), Chesbrough H., p.xxi

Chesbrough (2003) identified that the circle starts with the investments of a company in an internal R&D department. These investments are made, to discover breakthrough products or processes using internal R&D. If breakthrough products are developed, the company will introduce these products to the market. New sales potential is attracted and a higher margin can be attained, resulting in investing additional money in the R&D department. This will lead the company to the discovery of new breakthrough

products and processes. Because of the protection of Intellectual Property in a closed innovation environment, it's impossible for other companies to exploit these breakthrough products or processes.

The Closed Innovation model was used successfully during the 20th century and the basic technology of today has been introduced by using this model. In some industries, like the Nuclear industry, this proves to be the most successful model even today. But because of globalization, knowledge spread, the growing presence of venture capital and the pace of which information can be transmitted, it is impossible for most industries to maintain this model.

The reason mentioned above resulted in the fact that companies weren't able to hire all the available and relevant knowledge. Hence, the innovative capacity of the R&D departments decreased and more innovative products were available at the market. This resulted in the need for a new innovation model.

2.1.3.Open Innovation

As mentioned in the previous section, the closed innovation model was challenged by changes in the economical environment (Chesbrough, 2003). A first change was the mobility of knowledge employees and experts. If these employees or experts leave the company, they take their knowledge and expertise with them. Moreover, the new employer neglects to pay any compensation to the previous employer for that knowledge (Chesbrough, 2003). A second change is the high amount of training that can be obtained in colleges and universities. This enabled a spill-over of knowledge for companies in different industries and sectors (Chesbrough, 2003). Thirdly, we can identify the growth of venture capital firms that are looking to invest in breakthrough ideas in smaller companies or start-ups (Chesbrough,2003). As a last change, we can identify a tension between the incentives of the research and the development in large companies. This resulted in a buffer inventory of ideas that weren't used in the company (Chesbrough, 2003). Combining the first and third factor of change caused a new external option for ideas that weren't used in the company.

This resulted in the fact that the assumptions made in the Closed Innovation model weren't correct anymore. As a consequence we saw that the virtuous circle (figure 2) was broken. Chesbrough identified this changing reality, which is presented in figure 3.

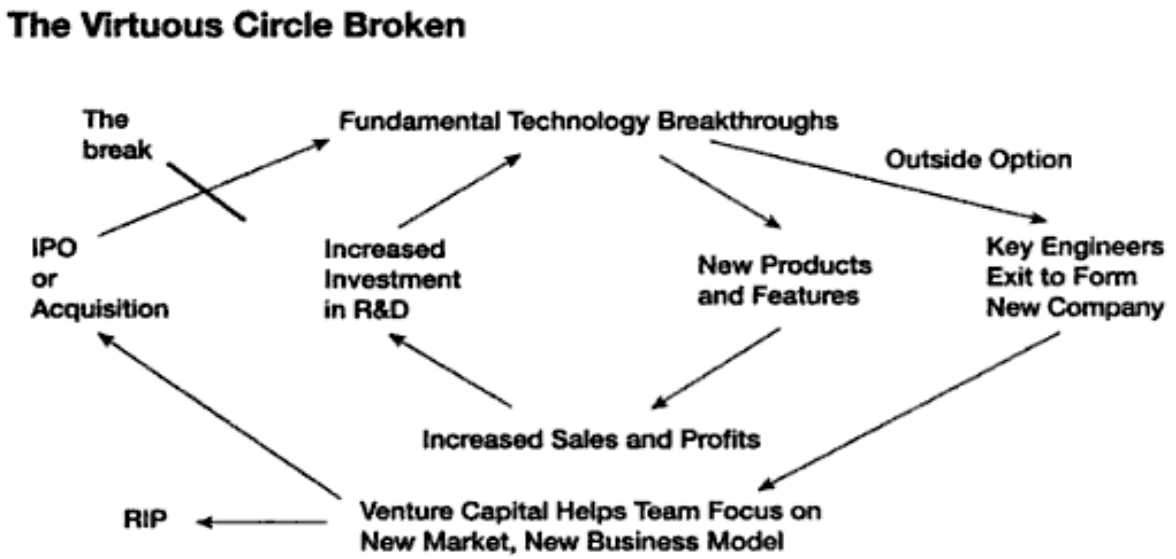

FIGURE 3: THE VIRTUOUS CIRCLE BROKEN

Source: Open Innovation: The New Imperative for Creating and Profiting from Technology (2003), Chesbrough H., p.xxiii

As presented in figure 3 and identified by Chesbrough (2003), we can see that by discovering a fundamental technology breakthrough there are two options for scientists and engineers. They can choose the internal path of the R&D center or they can choose the outside option. The latter is usually chosen when the company that funded the research didn't pursue the discovery or waited too long to do this. This new option broke the virtuous circle and offered scientists and engineers more opportunities to develop their discovery even further. In most of the cases, we can see that a start-up company is founded to do this research. With money and help from venture capital firms, scientist and engineers could focus on the development of the new technology. If they failed to develop this new technology, the start-up would stop and the technology isn't developed further. When successful, this start-up would be responsible for the commercialization of this new technology. Moreover, the start up might achieve an initial public offering or may be acquired at a competitive price.

In this new reality, companies that funded the research weren't able to profit from the discoveries that were made. This posed a new challenge to a lot of companies: "How can we profit from discoveries even if they are developed further by another company?" An answer to this challenge was provided by Chesbrough in his book "Open Innovation: the new imperative for creating and profiting from technology". In this book he described Open Innovation as a new innovation model.

In academic literature Open Innovation is defined as followed:

Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology. Open Innovation combines internal and external ideas into architectures and systems whose requirements are defined by a business model. The business model utilizes both external and internal ideas to create value, while defining internal mechanisms to claim some portion of that value. Open Innovation assumes that internal ideas can also be taken to market through external channels, outside the current businesses of the firm, to generate additional value. (Chesbrough, 2003, p. xxiv)

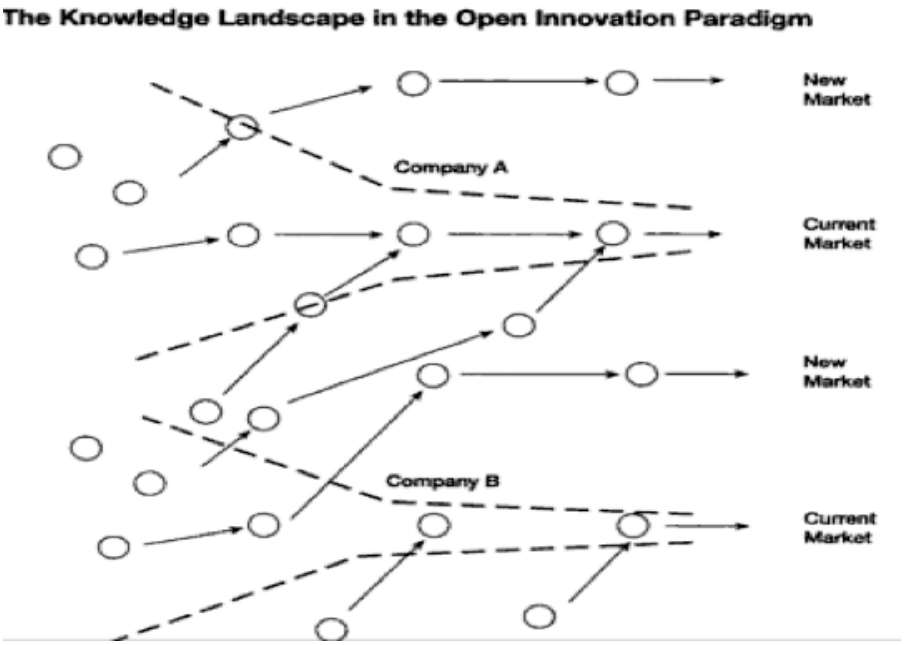

FIGURE 4: THE OPEN INNOVATION PARADIGM

Source: Open Innovation: the new imperative for creating and profiting from technology, Chesbrough H. (2003)

Open Innovation, which is also known as external or networked innovation, is a shift from the closed innovation model to a more open and external oriented innovation model.

As mentioned before Dr. Henry Chesbrough was the first to use the concept of 'Open Innovation' in 2003. As presented in figure 2, he used Open Innovation as an example to show that firms should not only use internal ideas or technologies but also external

ideas or technologies and paths to markets. By doing this companies would be able to advance their technology and products (Chesbrough, 2003).

Hence, Open Innovation means that firms should open up the boundaries of the firm to look for new and external technologies. Not only do they need to open up their organization, they also have to modify their business model to absorb the external technology. This will be discussed in detail in section 1.2 'Open Business Models'. But Open Innovation is not a one-way street; it can also be used to externalize internal ideas and technologies to be developed outside of the company. This will not only result in the development and introduction of more innovative products on the market but will also generate additional value and potential new business platforms.

When companies come in contact with useful ideas or technologies outside the company's boundaries a next step has to be taken. This next step in the process is the formation of a collaboration model in which both parties can work together to develop a new idea into a product. If it fits the corporate strategy, the product will be developed with support from the internal R&D department and an outside partner (other company, universities, etc.). This can be accomplished by having a formal collaboration. An example of such collaboration is Douwe Egberts and Philips who jointly developed the Senseo Coffee Machine. Another possibility is the creation of a start-up company partly funded by the company and its partner and partly by venture capital funds. In this form of collaboration the company can spread its risk between partners. Afterwards, both parties will create a roadmap of development, starting the development of a new product.

This new entity will develop an idea into a product with the help of management, researchers and engineers from both partners. In the short term both companies can benefit from the research done in the start-up. If, in the long run, the products are successful, one of the partners can merge or acquire the start-up. This will decrease the risk of failure in development and will broaden the current product scope.

If the new product doesn't fit the corporate strategy of the partners involved, there is still the possibility of selling the research to another company that can use it in his business model and scope of products. By doing this both companies can still gain money from licensing or selling the technology.

It's clear that the management of Intellectual Property in the Open Innovation model is quite different from the Closed Innovation Model. In the new model, companies cannot regard their knowledge as static. On the contrary, companies have to consider their Intellectual Property as a given that is fundamentally changing in time. It's impossible to keep promising new technologies on the shelf until they prove to be useful. In the Open Innovation model, Intellectual Property has to be managed to improve your own business model but also to gain from your rivals' business model. You have to create an R&D strategy that enables your R&D department to gain from the capabilities in a start-up company to start research on how to commercialize a new technology or to license promising technologies to other companies. It should even be possible that a company helps funding this start-up to develop a new technology outside the company's boundaries.

An important remark has to be made in this new paradigm. Orienting your company towards a more external oriented market research doesn't mean that investments in the R&D department have to be discontinued. Nevertheless, a transformation of the current strategy for the R&D center has to be made. Chesbrough (2003) created a new rationale for internal R&D.

"Chesbrough (2003) says that in a bountiful knowledge landscape, a company organizes its internal R&D for the following reasons:

- To identify, understand, select from, and connect to the wealth of available external knowledge
- To fill in the missing pieces of knowledge not being externally developed
- To integrate internal and external knowledge to form more complex combinations of knowledge, to create new systems and architectures
- To generate additional revenues and profits from selling research outputs to other firms for use in their own systems"

(Source: Chesbrough, 2003, p.53)

In the new paradigm, Chesbrough (2003) found out that the company's businesses cannot (and should not) wait for the internal technologies to arrive; instead, they should access what they need, as soon as they need it-either from inside the company's own research labs or from the knowledge created in someone else's lab." (Source: Chesbrough, 2003, p.53)

To summarize, Open Innovation is a new innovation model that enhances cooperation between internal and external parties. By using Open Innovation, companies can develop better products at a higher pace. Companies will be able to change the market and to create business for many years to come. International companies like Apple with the iPhone and iPad and Procter & Gamble with the Swiffer prove that collaboration by using Open Innovation is the new standard for new and better product development.

2.2. The importance of a Business Model

As mentioned in the previous section, companies will have to modify their business model if they want to practice Open Innovation efficiently. I will start this chapter by explaining the different functions of a business model. Afterwards, I will explain the different types of business models identified by Chesbrough. Thirdly, an overview of the reasons why business models should be more open will be provided. Afterwards I will go into detail on two of the processes that companies need to change in their current business model to make it more open.

2.2.1.The functions of a business model

Before elaborating on the reasons why companies should open their business model, I will explain the function of a business model for a company. Chesbrough and Rosenbloom (2003) have developed a framework of the functions of a business model:

- "To articulate the value proposition, that is, the value created for users by the offering based on technology;
- To identify a market segment, that is, the users to whom the technology is useful and the purpose for which it will be used;
- To define the structure of the firm's value chain, which is required to create and distribute the offering, and to determine the complementary assets needed to support the firm's position in this chain;
- To specify the revenue generation mechanism(s) for the firm, and estimate the cost structure and target margins of producing the offering, given the value proposition and value chain structure chosen;
- To describe the position of the firm within the value network linking suppliers and customers, including identification of potential complementary firms and competitors;

- To formulate the competitive strategy by which the innovating firm will gain and hold advantage over rivals." (Chesbrough and Rosenbloom (2003))

2.2.2.Different types of Business Models

Chesbrough (2006) identifies in his book "Open Business Models: How to thrive in the new innovation landscape" that there are five different business models that can be used by companies, as shown in figure 4.

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Business model	Undifferentiated	Differentiated	Segmented	Externally aware	Integrated	Adaptive
Innovation model	None	Ad hoc	Planned	Externally supportive	Connected to business model	Identifies new business model
IP management	NA	Reactive	Defensive	Enabling asset	Financial asset	Strategic asset
Examples	Family farms, Cafés, barber shops,…	Start-up companies	Technology push companies	Firms with established corporate R&D activities	IBM, Eli Lilly	Dell, Wall Mart

FIGURE 5: THE BUSINESS MODEL FRAMEWORK

Source: Chesbrough H. (2006), *Open business model: How to thrive in the new innovation landscape* (adapted from p.111)

Companies that use type 1 as a business model will compete on price and availability (Chesbrough, 2006). They are selling commodities and will do business like many other companies. This means that they won't have any research and development centers and that they won't have a lot of Intellectual Property in the company. They don't only create very little Intellectual Property; they also don't have the resources to defend it (Chesbrough, 2006). Type 1 companies can change but they won't initiate this change themselves, they will copy an idea or technology that is successfully used in other companies.

Companies with a second level business model offer more differentiated products and services. This implies that they have to differentiate their business model in comparison with type 1 companies. These companies possess a certain amount of Intellectual Property but innovation activities are done without any prior planning or well structured management (Chesbrough, 2006).

Type 3 companies are able to do more planning about their future, because they have developed a business model that allows the company to begin to segment its markets (Chesbrough, 2006). This allows the company to compete in different segments at the same time. The company counts on its business model to select outcome from its internal R&D department and to commercialize these outcomes. In a type 3 company innovation isn't random anymore, it's planned and managed with a clear view to the companies future. In these types of companies Intellectual Property plays a vital part in the business model. Intellectual Property is managed closely and defended intensely (Chesbrough, 2006). Companies in the closed innovation model use this type of business model.

Type 4, 5 and 6 business models are thought of as more open business models. A type 4 company starts to open its business model to the environment. By doing this they are able to unlock an enormous amount of research available for the company. This means that customers and suppliers also have a role in the innovation process (Chesbrough, 2006). Innovations created outside the company are reviewed and Intellectual Property is managed to enable assets. This does not only allow these types of business models to attract external technologies but also allows them to license out own technologies to other companies (Chesbrough, 2006).

In a type 5-business model, companies are focusing their business model on new markets and businesses as well as their current business. This means that internal and external R&D activities are integrated to be used in one business model. Intellectual Property plays a central role in this business model and is managed as a strategic and financial asset (Chesbrough, 2006). The type 5-business model is used by companies in the Open Innovation model.

The last type of business model is the most open business model identified by Chesbrough and Rosenbloom. Companies using this business model have the unique capability to innovate their own business model and to drive the business model of both suppliers and customers. Technical and financial risks as well as benefits are

shared with external partners, spreading the risk of failure. Intellectual Property is managed as a strategic asset, enabling the company to move into new businesses and leaving existing markets. In a Type 6 company, the management of innovation and even Intellectual Property is imbedded in every business unit (Chesbrough, 2006, p. 111-134).

2.2.3. A Changing environment for Business Models

As mentioned before, companies that don't innovate will, in the short term, lose market share and revenue to the competition and will, in the long term, be outcompeted by its competitors. But as discussed in the previous sections, in the economy as we know it today, firms have to innovate differently than they did before. The closed innovation model that has been used for decades is transformed into an Open Innovation model. This means not only searching for ideas on the market but also absorbing and collaborating with external knowledge, resulting in the transformation of the business model. In the following paragraphs I will explain the most important reasons why the business model has to be changed in more external and open oriented business models.

In this changing environment, Chesbrough (2006) identified in his book 'Open Business models' the first reason to open up a company's business model namely the '*new division of innovation labor*' (Chesbrough, 2006). He noted that companies that provided the idea didn't necessarily develop it further on their own and didn't introduce this idea to the market. On the contrary, those companies would sell this idea if they wouldn't develop it themselves or they will license this idea to a partner, which would later on develop the idea into a product. This implies that both companies would engage in a collaboration model to develop a new idea into an innovative product and to introduce this idea on the market.

Companies that succeed in bringing ideas from the market into the company can draw on an enormous potential for attracting and creating new value. On the other hand, companies that can move ideas from the company to the market will enable others to develop unused ideas and result in a new way to capture more value. But this new division of labor has some consequences for the business model. To utilize this change in labor efficiently, a new and open business model has to be created. By opening up their business model, companies would facilitate the absorption of external knowledge, ideas or technologies and would facilitate the transfer of internal knowledge, ideas and

technologies to the market. By doing this, companies are able to use Open Innovation in two directions.

The second reason to have a more open business model is the *changing economical environment* (Chesbrough, 2006). The great research and development centers of the last twenty years have been downsized, broken up, or redirected to new purposes in the West, while new labs are springing up overseas in large countries such as India and China, as well as small countries such as Finland and Israel (Chesbrough, 2006). Because internal R&D departments didn't have the power and the knowledge as a result of the changing economic environment, companies had to change the way in which they practiced innovation. This changing environment proved that a closed business model wasn't sufficient to deal with this new environment.

The third reason is the *changing cost of labor and the rising costs of technology development* (Chesbrough,2006). By liberating, and thus, opening the labor market new, skilled and cheap labor forces entered the western labor markets (Chesbrough, 2006). Because it was too expensive to keep R&D centers in the western industries, companies were obliged to move their research centers to the cheaper Asian market. This resulted in significant lower cost for the R&D center and made the developing of innovative ideas much cheaper. Because of the introduction of R&D centers, we can see that companies have built strong R&D centers in Asia. Moreover, we can see that by moving R&D centers to Asia, companies were able to enter new and rapidly expanding markets.

At the same time we identify a higher cost for the development of technology. An example of a sector that had to cope with this rise in development cost is the pharmaceutical sector. Janssen Pharmaceuticals has to invest 2 billion dollars to develop a new drug; 20 years ago this amount was divided by ten.

This higher development cost resulted in significant reduction of the product life cycle. To continue the example of the pharmaceutical sector, it takes fourteen years to develop a drug and get it approved by the FDA. The patent itself lasts for only twenty years. This implies that a pharmaceutical company has only six years to earn the investment back and to profit from this drug. As the patent expires, over-the-counter pharmaceuticals will start copying this drug and profit will decrease. The combination of rising development costs and shortening market windows compresses the economics

of investing in innovation, reducing the companies ability to earn a satisfactory return on its innovation investment (Chesbrough, 2006).

Figure 6 illustrates this changing environment. In this figure we compare the closed innovation model with the closed innovation model with the rising cost of technology, products with a shorter life cycle and with bigger investment costs for developing new products. In the first model revenue is much bigger than the initial development cost, this results in a high return-on-investment. In the second model we can see that a higher development cost and a shorter product life cycle results in a lower return-on-investment.

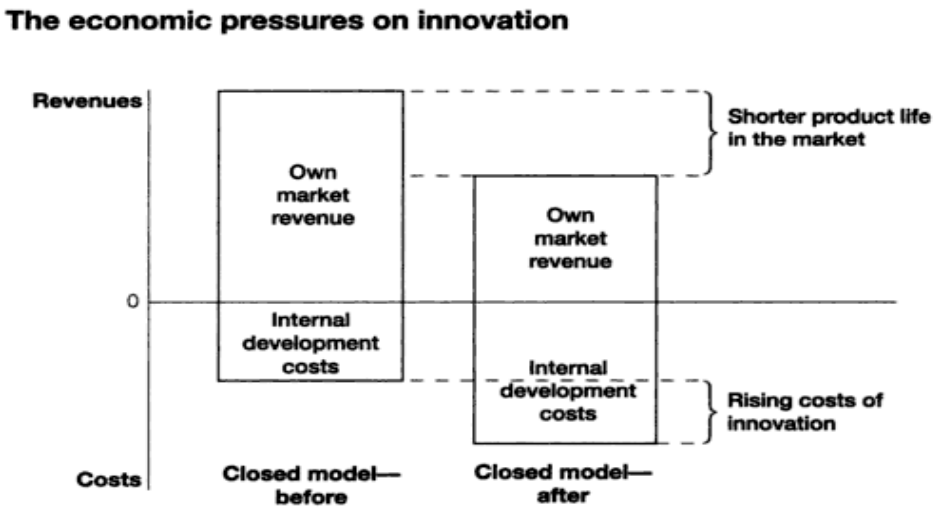

FIGURE 6: THE ECONOMIC PRESSURES ON INNOVATION

Source: Open business models, Chesbrough H. (2006)

The changing environment implies that a change to the innovation model and the business model has to be made. The return-on-investment is too small are even not existing in some cases.

The last reason is the mobility and speed of knowledge. In the twentieth century, international companies (IBM, AT&T, Microsoft, etc.) hired all relevant knowledge that was available on the labor market. But in the current globalized economy, knowledge can be transferred at a much higher pace than before. This results in a change in the labor for R&D departments. Instead of working for one company, experts and knowledge workers rent themselves to more companies. As a freelancer, the employee can offer more specialized labor and the ability to be hired by more then one company. For the companies, on the other hand, this results in inefficient R&D centers. To be

able to stay innovative, companies have to change the way in which they practice innovation. This change implies a change in the innovation model as well as in the business model.

2.2.4.Towards an Open Business Model

When using the Open Innovation model, it will be the business model that determines the successful search for external technologies or ideas. To know what you need to change in your business model you first need to know what type of business model you have today and which business model you want in the future.

Chesbrough describes in his book 'Open Business Models: how to thrive in the innovation landscape' a framework which can be used to review your current type of business model (section 2.2.2.). A first step in this framework is the review of the current business model. In the next step managers have to examine which business model they want to attain. Afterwards they have to create a list of items that have to be changed in the current business model to achieve the next type of development.

To end this chapter I will go into detail on two of the most important changes for a company that is creating an open business model. First of all, creating an open business model means to *open up the boundaries of the company* (Chesbrough, 2006). By doing this, influences and knowledge from outside the company can be absorbed by the business units. This process starts early in the innovation cycle, as shown in figure 4. Starting from the idea phase, companies should look for partners to save time and most importantly costs in the development of this idea. This results in splitting the burden of the R&D investment between two or more companies.

After the idea is developed into a product, revenue can be generated. A part of the revenue will be generated by the companies. Licensing, selling or asset partitioning with other companies will generate the other part of the revenue.

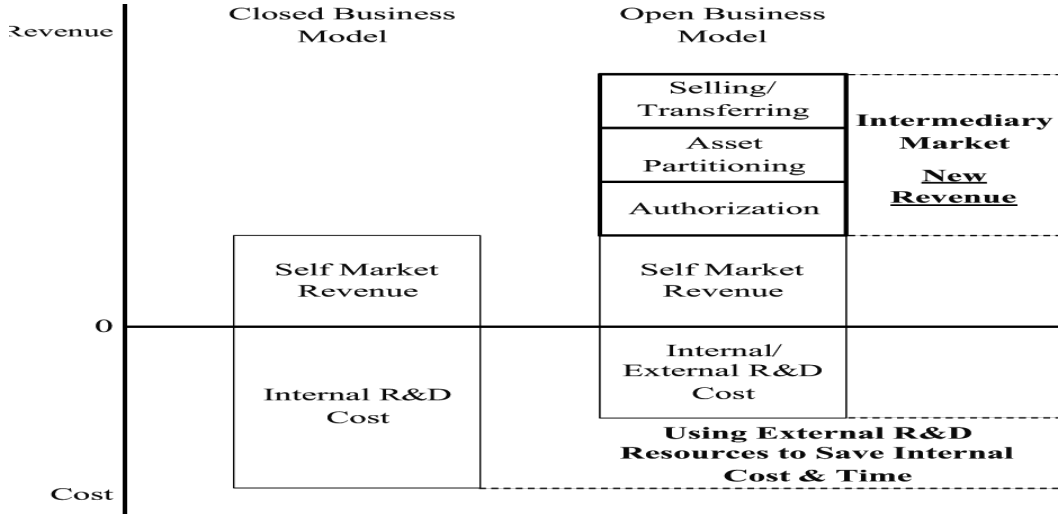

FIGURE 7: OPEN BUSINESS MODEL

Source: SME competitive strategy: learning from Taiwan's ODM industry, Chih-Ming L., Hung-Fan C. (2011)

A more open business model also changes the view on *Intellectual Property management* in companies (Chesbrough, 2006). The open business model views Intellectual Property in bundles or clusters within an overall portfolio that supports the business model (Chesbrough, 2006). This means that Intellectual Property that isn't used internally is a possible candidate to be licensed out to another company. On the other hand, Intellectual Property that is available on the market can be a candidate to be developed in a partnership. But in both cases Intellectual Property management as we know it today will form an obstacle to efficiently use Open Innovation.

We can summarize that open business models not only reduces cost and risk in the development phase but also generates more revenue after the idea is developed into a product. An open business model can also, through licensing or selling unused ideas to outside firms, attain additional sources of revenue. But to be able to use these new benefits, changes have to be made not only in the management of the business units but also the management of Intellectual Property. In creating an open business model, companies also have to create a strong innovation network. This network will make collaboration with companies easier and will create an Open Innovation image for your company.

2.3. Comparison Closed and Open Innovation

In section 2.1.2 and 2.1.3 I have introduced closed and Open Innovation. In this section I will provide the reader with a comparison between those two models.

Closed Innovation Principles	**Open Innovation Principles**
The smart people in the field are working for us.	Not all the smart people in the field work for us. We need to work with smart people inside and outside the company.
To profit from R&D, we must discover it, develop it, and ship it ourselves.	External R&D can create significant value: internal R&D is needed to claim some portion of that value.
If we discover it ourselves, we will get it to the market first.	We don't have to originate the research to profit from it.
The company that gets an innovation to the market first will win.	Building a better business model is better than getting to the market first.
If we create the most and the best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our Intellectual Property; so that our competitors don't profit from our ideas.	We should profit from others' use of our Intellectual Property, and we should buy others' Intellectual Property whenever it advances our business model.

Source: Chesbrough, 2003, p. xxvi

As we can derive from the table, closed innovation is a more conservative manner to practice innovation compared to the Open Innovation model. The closed innovation model doesn’t use or adapt to changes, like globalization, technology revolution etc. Some industries such as the nuclear industry, where extensive research still has to be

done in order to be successful still use the closed innovation model. This closed innovation model is assumed to be safer for Intellectual Property management and thus protects the company's investment.

Open Innovation uses the advantages of a changing environment to its maximum. This is one of the reasons why companies that are implementing Open Innovation in the correct manner are able to attract significant benefits. Using an external company doesn't mean that investment in the internal R&D department should be discontinued. Only a change in investment has to be made to be able to modify the R&D department to an external directed department. In other words, it had to increase its absorptive capacity (Cohen and Levinthal, 1990). Investments to prepare internal researchers for a new external technology should be done instead of investments for doing basic research in the company itself.

A significant difference between open and closed innovation is the use of venture capital. In the Closed Innovation model Venture Capitalist are viewed as pirates and parasites (Chesbrough, 2003). In Open Innovation, companies embrace the use of Venture Capital (VC) in developing new technologies using start-ups. Some Open Innovation Companies like Janssen Pharmaceutica use an internal venture capital fund to start up new companies. The Venture Capital Fund at Janssen Pharmaceutica will be discussed in chapter five. Because of this change the use of venture capital has grown exponentially in the last ten to fifteen years. Figure 5 presents this change using the pharmaceutical industry.

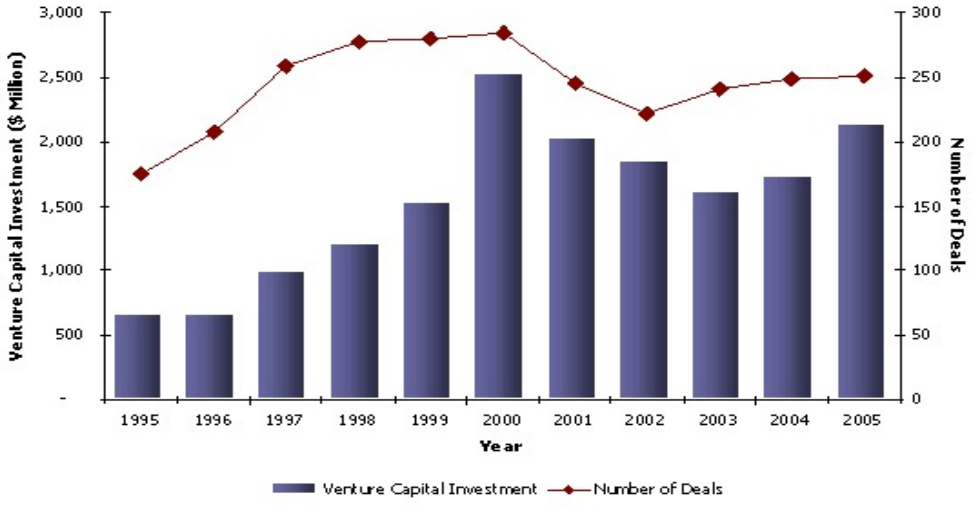

FIGURE 8: VENTURE CAPITAL ACTIVITY IN THE U.S. MEDICAL DEVICES INDUSTRY FOR THE PERIOD 1995-2005

Source: Frost & Sullivan, *Venture capital investments in the medical devices industry*, consulted via Google. (http://pharmalicensing.com/public/articles/view/1150990879_449aba1fc494e/venture-capital-investments-in-the-medical-devices-industry)

As mentioned before, there is also a significant difference in the management of Intellectual Property. In many companies decisions about licensing software or products or patenting new technology are handled by the legal department. In most companies we can even say that the Intellectual Property is not a part of the company's strategy and is managed to protect the design freedom of the internal staff. On the contrary, we can see that Open Innovation considers Intellectual Property as an essential part of the company's strategy and they want to manage IP on a strategic level in the company. This means that companies in Open Innovation are interested in selling or licensing Intellectual Property and are interested in buying Intellectual Property from other research labs as well.

It's clear that the Open Innovation paradigm is still young, meaning that a lot of research still has to be done. As described in section 1.1.3 companies like Apple, Proctor & Gamble, IBM etc. prove that Open Innovation is the new standard for new and better product development.

Chapter 3: Corporate Renewal

In this third chapter I will go into detail on the term "Corporate Renewal". Understanding this concept is vital to understand the processes used in the remaining of this thesis. I will start by giving a definition of "Corporate Renewal". Afterwards I will elaborate on the different processes involved in this concept. In the third section, I will go into detail on how companies can deploy Corporate Renewal at the business and the corporate level. After this, I will explain competences building in Corporate Renewal. To end the chapter I will explain the main approaches of Corporate Renewal followed by the link between Corporate Renewal and Open Innovation. This chapter is a preparation of the case studies I will present in the following two chapters. The processes used in Corporate Renewal will also be used in chapter six, where a new framework will be developed.

3.1. What is Corporate Renewal?

Corporate Renewal has attracted more and more attention from the academic world and industries. However, there is no widely accepted definition of Corporate Renewal. In many research papers, the process of Corporate Renewal is recognized as a process of strategic renewal. Strategic renewal is defined as the transformation of organizations through innovation of the corporate nature (Guth and Ginsberg, 1990; Dess, 1999) within its environmental context to rejuvenate the organization (Covin et al., 1999).

Dess et al (1997) identified that Corporate Renewal is recognized to exist in a firm that engages in new product development, proactive to the challenges and with the goal of beating its competitors. The process of Corporate Renewal is also thought as domain redefinition of a firm that is looking to create the first-mover competitive advantage and imprint the early structure of an industry (Covin et al., 1999).

As a conclusion we can say that Corporate Renewal is an entrepreneurial oriented restructure process to actively make strategy to interpret the environmental challenge, and to seek the leading advantage through restructuring of an industry. In fact, we can regard the Corporate Renewal process as a proactive strategy making process.

3.2. Processes of Corporate Renewal

In order to renew a company, it's imperative that management builds a strategic architecture. This is a roadmap to identify the core competences that a company needs to build together with its constituent technologies (Prahalad and Hamel, 1990).

As a process to challenge a company's strategy (Bartlett and Ghosal, 1995), a company has to renew and innovate according to the strategic disciplines of stretch, which enhances the fit between a company's resources, the opportunities it pursues, and the importance of leveraging resources (Hamel and Prahalad, 1993). By using strategy as stretch a company is able to review the current knowledge and assets of a company with the future the company wants to pursue. Strategy as stretch recognizes the essential paradox of competition: leadership cannot be planned for, but neither can it happen without a grand and well-considered aspiration (Hamel and Prahalad, 1993).

The success of companies like Dell, IBM and Apple in the computer industry indicates that the strategy as stretch is an approach of trying to change the rules of engagement to ensure a company of its leading position (Hamel and Prahalad, 1993). Such competitive innovation or strategic innovation is an important way of shielding resources (Hamel and Prahalad, 1993). When strategy innovation happens, a company has renewed.

In Corporate Renewal it is important to have a good business model. Most often the trigger for companies to deploy Corporate Renewal is the fact that when a new model changes the economics of an industry and is difficult to replicate, it can by itself capture a large enough portion of the economic value (Teece, 2007) and create a strong competitive advantage (Magretta, 2002). On the other hand, when a business model becomes a normal business model there is no advantage from this model. Then the company has to shift its business model by using Corporate Renewal to deal with the new competitive realities (Magretta, 2002). A perfect example of this shift is the case of Dell. When Dell saw that selling personal computers in retail didn't deliver enough profit anymore, they changed their strategy and started to sell directly to the customer. This enabled Dell to survive in a highly competitive industry.

In short, we can say that a company has two possibilities for Corporate Renewal. The first one is to try to change the model of the industry to attain a competitive advantage. The second one is to change its business model to deal with a changing

economic environment. Moreover, it is imperative to stress that a good business model achieves short-term competitive advantages, while Corporate Renewal contributes to long-term advantages. This means that there is no long-term success without short-term performance just as short-term results mean little unless they contribute to building the long-term ambition (Ghosal and Bartlett, 1995).

Within Corporate Renewal we can say that a good business model provides the resources needed for Corporate Renewal – not just money and people, but also legitimacy and credibility – while Corporate Renewal leverages the hope and energy needed for new business models (Ghosal and Bartlett, 1995). Therefore, we argue that Corporate Renewal will contribute to the continuous and sustainable development of companies in a dramatically change era, especially to recover from an economic crisis.

3.3. Corporate Renewal from business to corporate level

There is considerable evidence that business success depends as much on organizational innovation, e.g., design of business models, as it does on the selection of physical technology (Teece, 2007). As we can derive from academic literature, the invention and implementation of business models and the associated boundaries of a firm involve issues with business success as well as the development and adoption of the physical technologies themselves (Teece, 2007).

Based on the research on strategic renewal (Dess et al, 1999), we suggest that Corporate Renewal requires not only corporate level strategies, for instance addressing product-market scope, but also business level strategies like identifying sources of sustainable competitive advantage. As mentioned before, we can say that a suitable business model can keep a company highly competitive for a decade if the environment is stable (Teece, 2007), while Corporate Renewal can keep a company long-term competitive in a dynamic environment. This means that Corporate Renewal is a process from the business level to the corporate level as well as a process from the stable to the dynamics.

As Crossan and Berdrow (2003) address that the fundamental tension of Corporate Renewal is the tension between exploration and exploitation. Exploration means that a company is looking into technological and social trends to evolve its business. This results in investments in new technologies outside a company’s current scope of products. Exploitation means that a company is exploiting existing technologies in

existing businesses. These are investments in existing technologies that evolve the current products scope of a company. The process from exploitation to exploration is a process of organization learning and means that a company should use Corporate Renewal to evolve from exploiting running businesses to exploring new businesses.

As a conclusion, we can say that any company, large or small, should recognize the dynamic change of market, react timely, continually reappraise its business models, and execute a transformation of the company. With this transformation a company should focus on exploration instead of exploitation. That is to say, the global and fundamental change of markets force a company to focus its strategy rather on Corporate Renewal than on developing current businesses.

3.4. Competences building in Corporate Renewal

It is widely recognized that competitive advantage and growth possibility is generated and sustained through a company's core competences to integrate, build and reconfigure internal and external capabilities to address changing opportunities (Prahalad and Hamel, 1990; Teece, Pisano and Shuen, 1997). This means that core competences can function as the engine for new business model innovation (Prahalad and Hamel, 1990; Chesbrough and Schwartz, 2007). On top of this statement, we can argue that it is important to have dynamic competences not only on the mechanisms that produce and deliver a product or a service (i.e. the business model) in order to achieve competitive advantages, but also on the primary drivers of Corporate Renewal to sustain the leading priority.

Core competences refer to a company's distinct skills, processes, procedures, organizational structure, decision rules, and disciplines that directly support superior long-run business performance (Teece, 2007), which differentiate a company strategically and provide a company specific competitive advantages (Leonard-Barton, 1992), such as first mover advantage (Lieberman and Montgomery, 1988).

Teece and others bring the concept of core competence to a dynamic level (Teece, 1986, 2006; Teece et al., 1997; Helfat et al., 2007) by arguing that dynamic core competences empower companies to adapt quickly to changing environment (Prahalad and Hamel, 1990), and enable companies not just to invent but also to innovate profitably (Teece, 2007) and deliver an ongoing flow of innovations to multiple markets

(Prahalad and Hamel, 1990). In addition, core competences are built through a process of continuous improvement and enhancement that may span a decade or longer (Prahalad and Hamel, 1990), thus it is path dependency (Teece, 2007) with heuristic logic (Chesbrough and Rosenbloom, 2002).

However, core competences have a flip side, core rigidities, which are deeply embedded knowledge sets that actively create problems and may hinder innovation and development (Leonard-Barton, 1992). Therefore in their interaction, with the development process, core competences cannot be managed as a single good or bad entity (Leonard-Barton, 1992). It is difficult to overcome core rigidities because they include a pervasive dimension of values, and managers unwittingly collude to avoid actions that challenge modes of behavior (Leonard-Barton, 1992).

Attacking core rigidities often means undermining the current economic foundations of the firm. This means cannibalizing current product lines, making current knowledge bases and skills obsolete and lessening the value of current assets (Leonard-Barton, 1992). This results in the fact that core rigidities will not be (and should not be) embraced instantaneously (Teece, 2000). Company managers should constructively 'discredit' (Weick, 1979) the systems, skills or values traditionally revered by companies and need to maintain evolutionary fitness (Helfat et al., 2007; Teece, 2007). If necessary, companies should try to escape from unfavorable path dependencies, in an effort to create an entirely new 'break out' structure (Teece, 2000) within which an entirely different set of structures and procedures is established (Teece, 2007). With this new 'break out' structure companies should completely redefine core competences or initiate new ones (Leonard-Barton, 1992).

In other words, a new business model is not enough to drive the company's development. It is urgent to rejuvenate the organization. When the core competence does not fit the changes in the environment and becomes core rigidities, the company must enunciate the strategic innovation to renew and guide the new competence acquisition and cultivate process.

However, the link between Corporate Renewal and dominant logic (or core rigidities) presents a paradox: while Corporate Renewal is going to change the dominant logic, we will see that the dominant logic will become the rigidities that will obstruct Corporate Renewal. The idea of viewing Corporate Renewal and core competences as dynamic entities adds an important aspect to academic research as it highlights the

importance of Corporate Renewal on the way value is created and captured at an organizational level.

3.5. Main Approaches of Corporate Renewal

Corporate Renewal is entrepreneurial in nature because it wants to maintain dynamic capabilities (Teece, 2007). Corporate entrepreneurship refers to a distinct multidimensional and empirically verifiable set of organizational phenomena plus the presence of the objective of rejuvenating or purposefully redefining organizations, markets or industries in order to create or sustain competitive superiority (Covin et al, 1999). Corporate venturing is clearly an explorative and experimenting process (Elfring and Foss, 1997).

Three outcomes of the internal corporate entrepreneurship process may happen: (1) failure to turn the perceived opportunity into a profitable business proposal, (2) the success of the venture, and (3) a spin-off (Elfring and Foss, 1997). In addition, the process of corporate venture requires not only an adequate variation generating mechanism and a selection mechanism (e. g. Penrose, 1959; Ghemawat and Ricart i Costa, 1993; Levinthal, 1995; Marengo, 1995) but also a third capability, the capability required to secure a steady availability of intrapreneurs motivated to "champion" ventures (Elfring and Foss, 1997).

Thus internal corporate entrepreneurship or external spin-offs can be recognized as a critical approach to renew your company and to keep its long-term competitiveness in a dynamic environment (e. g. Covin et al., 1999; Leonard-Barton, 1992; Elfring and Foss, 1997; Chesbrough and Rosenbloom, 2002). We can say that Corporate Renewal invents a new competitive rule that is genuinely different from industrial rivals.

3.6. Corporate Renewal and Open Innovation

A process of Corporate Renewal is built on two symbiotic components: rationalization and revitalization (Ghosal and Bartlett, 1995). The rationalization component focuses on resource use – the effectiveness with which existing assets are deployed – and strives for continuous productivity growth. Revitalization refers to the creation of new competences and new businesses as well the changing of existing rules of the game

and the leap-frogging of competition through quantum leaps (Ghosal and Bartlett, 1995).

When a new business model development does not fit the core competence of a company, the company has two strategies to make. The first one is a spin-off strategy to separate the new business model out of the companies, such as Xerox's spin-off companies studied on the research of Chesbrough and Rosenbloom (2002). The other is through Corporate Renewal regarding to the absorptive capacities and Open Innovation capabilities, to cultivate a new core competence. The second method is much more difficult for a company to conduct than the first one. This is called strategic innovation.

As markets globalize, competition intensifies, and both consumers and investors become more demanding, strategic innovation will not just be left to a handful of insightful entrepreneurs but will become a necessary weapon for corporate survival and growth (Styles and Goddard, 2004).

Corporate Renewal contains two tasks at both business level and corporate level. The first is to design new business models to achieve the strategic ambition; the second is to reassess a company's skills and assets to enact the new business models (Styles and Goddard, 2004). Some resources and skills will no longer be needed while others will have to be acquired via Open Innovation, such as through mergers and acquisitions, strategic alliances, outsourcing, or some combination of these.

If we look into the long-term competitiveness we can identify that this depends on a managers' willingness to challenge continually their managerial frames (Hamel and Prahalad, 1993) and his willingness to rejuvenate their mind-set. When firms have the ambition to rejuvenate competences or to build new ones, they have to have a sense of overall strategic direction.

Strategy as stretch provides a direction but also identifies the major competences to build or upgrade, and is therefore a crucial part of the strategic renewal processes (Ghoshal & Bartlett, 1997; Volberda, Baden,Fuller & van de Bosch, 2001). Furthermore, the tension stimulates managers and employees the get committed to learning processes accelerating the building of new competences (Vanhaverbeke and Peeters, 2005).

In short, as markets evolve, customer priorities change and the industrial environment shifts, companies need to challenge their current strategies, and adapt current process of Corporate Renewal to incorporate the principles of Open Innovation. Otherwise, they will fall into the dominant logic with their strategically converged rivals.

Part 3: Case studies

Chapter 4: Case Study DSM

As a first part of the case study I choose to cooperate with DSM. DSM is a global science-based company active in health, nutrition and materials. I choose DSM to conduct my case study with because they are one of the first companies to use the Open Innovation model in their business model. To be more precise they created the DSM Open Innovation Center in the Netherlands. Within this DSM Innovation Center they are also one the first companies that use Open Innovation for Corporate Renewal. To write this chapter I did interviews with Rob Kirschbaum, the Vice President of Open Innovation, Jos Put, Chief Technology Officer of DSM and Hein Schreuder, Executive Vice President of DSM Corporate Strategy & Acquisition.

First I will go into detail on the history of DSM and the transformation of its strategy in the last decade. Afterwards I will examine how DSM practices Corporate Renewal with special attention to the Strategic Process within DSM. In the third section I will discuss the Innovation efforts of DSM and the creation of the DSM Innovation Center. Afterwards I will discuss the difference between Open Innovation in the running business and innovation in the DSM Innovation Center. In the fifth section, I will go into detail on the creation and the management of the Emerging Business Areas (EBA's) Bio-Based Products & Services, Bio-Medical and DSM Advanced Surfaces within the DSM Open Innovation Center. To end this chapter I will provide the reader with a short conclusion. The information and pictures used in this chapter are extracted from a pdf-file provided by Rob Kirschbaum and information from the DSM website.

4.1. History of DSM and DSM's Strategy

DSM has gone through drastic changes during the last ten to fifteen years. They started as a coal company in 1902, formed by the Dutch government. In 1965, DSM decided to close down the coal mining activities and to transform the activities of the company to chemicals and fertilizers. During the 1970s and '80s DSM underwent major reorganizations to ensure sufficient scale and to diversify into high-quality plastics and fine chemicals. After 1985, DSM developed a number of innovation projects resulting in specialties such as the polyethylene fiber Dyneema. During the 1990s, DSM changed its focus towards a better balance between sales and research and development value-adding processes and products.

Starting from this transformation DSM focused on products for the pharmaceutical industry, the food industry and performance materials for the automotive and transport industry and the electrical and electronics sector. By selling the petrochemicals business and the acquisition of Roche's Vitamins & Fine Chemicals Division, DSM finished its transformation. Today the company is specialized in Life Sciences and Materials Sciences. This transformation is presented in the picture below. Within DSM there are four business groups: Nutrition, Pharmaceuticals, Performance Materials and Polymer Intermediates.

FIGURE 9: DSM'S HISTORY

Source: PDF Rob Kirschbaum, 2010

This transformation changed the percentage of sales of the different departments within DSM.

As presented in figure 10, we can see that the commodity chemicals have been decreasing starting in 2000 until almost nothing in 2010. On the other hand we can identify an increase of Nutrition, Performance Materials and Polymer intermediates.

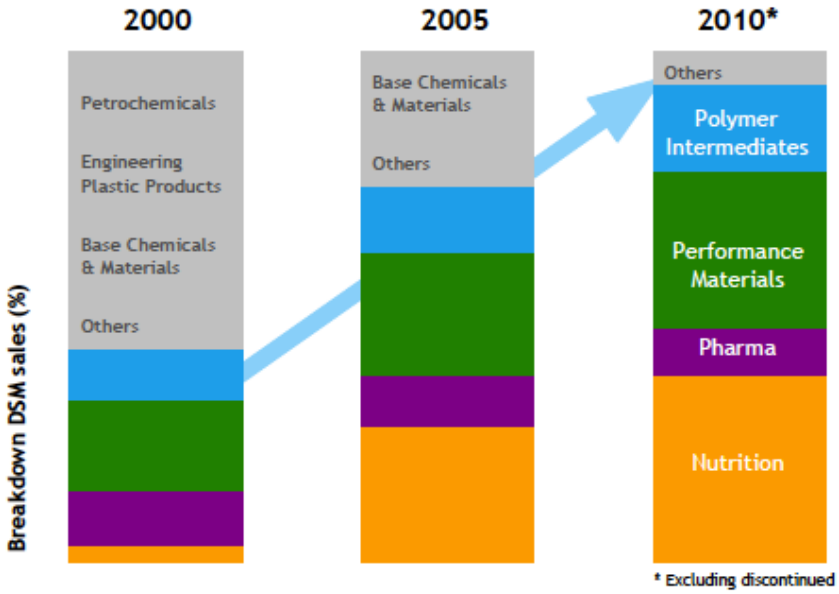

FIGURE 10: BREAKDOWN DSM SALES (%)

Source: PDF, Rob Kirschbaum

As shown in figure 11, DSM implemented a new strategy focusing primarily on four pillars. The first one is higher influence in high growth economies. This means that DSM has to expand their activities in these economies, resulting in an increase of 50% in sales from high growth economies. The second pillar is the acquisition or partnership with outside companies. This means that the company is looking for partners that can complete their competences. Thirdly, DSM wants to stay a sustainable company. This already resulted in the first place at the Dow Jones Sustainability Index, reduced emissions, and the UN World Food Program Collaboration. In the future DSM want increase its efforts in sustainability in delivering value on the three P's (Planet, People and Profit). Moreover, DSM wants to increase its ECO+ products to 80% for innovations and 50% for existing businesses. The fourth pillar of DSM's strategy is innovation. DSM is known as a leading company in innovation with over 1 billion € sales on innovations.

Additionally, DSM increased the speed of innovation and created four Emerging Business Areas as well as an innovation infrastructure and culture. In the future DSM wants to increase innovation sales to 20% of total sales within the company as well as the generation of 1 billion € sales from the Emerging Business Areas. Moreover, DSM wants to focus innovation on defined platforms and they want to set up Innovation Center in China and India.

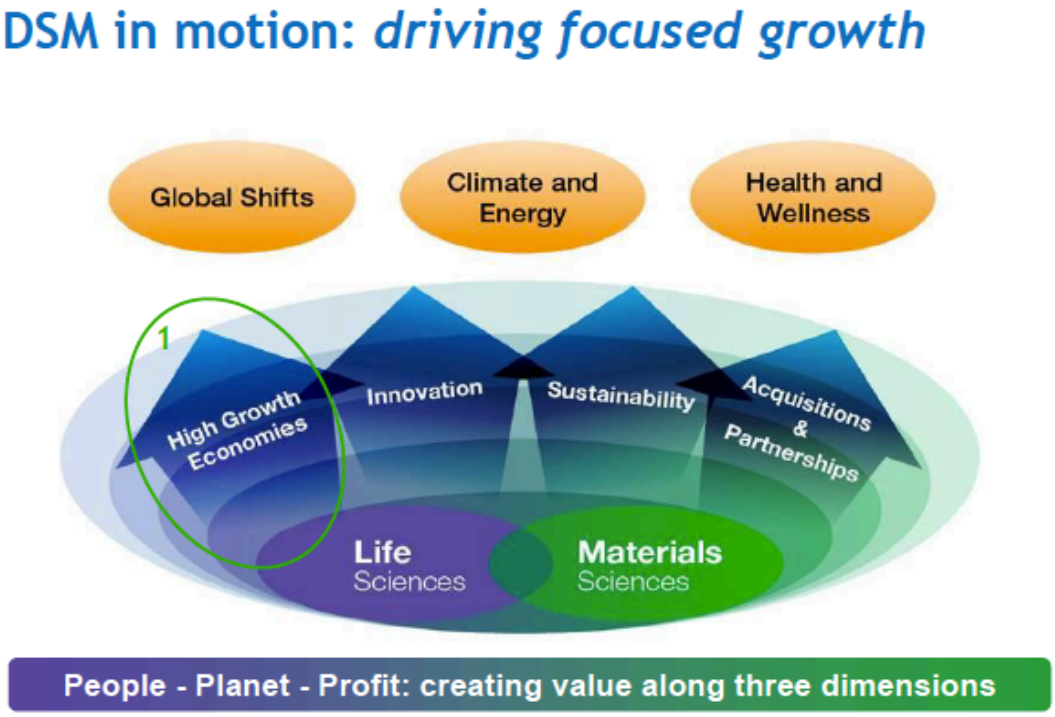

FIGURE 11: DSM IN MOTION: DRIVING FOCUSED GROWTH

Source: PDF Rob Kirschbaum

4.2. Corporate Renewal within DSM

From the start of the company, DSM has been changing its strategy. As mentioned before, DSM started as a coal mining company owned by the government and now it has become a major player in the Life Sciences & Materials Sciences industry. In figure 12, we can see the evolution from the beginning until now.

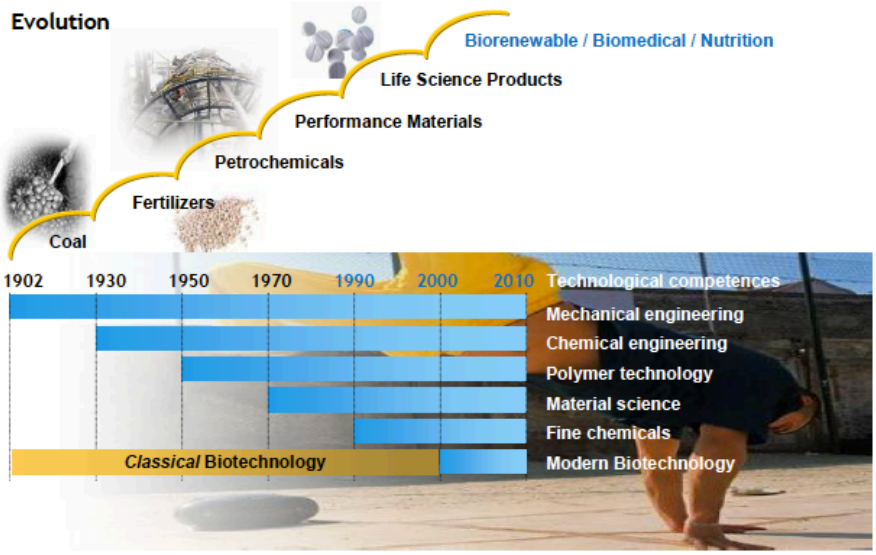

FIGURE 12: CORPORATE RENEWAL WITHIN DSM

Source: PDF Rob Kirschbaum

As we derive from this figure, DSM moved from a coal mining company to a bulk chemicals company to the specialized chemical company of today. This evolution didn't only change the industry of DSM; it also changed the business model of the company.

Today the company is applying Corporate Renewal within their current strategy. By looking into trends in Climate & Energy, Health and Wellness and Global Shifts and by implementing new discoveries in these areas into the Innovation Center, DSM proves that it is looking to advance their strategy and business model with innovation. Instead of changing the industry in which it is operating, DSM is now looking to have a first mover advantage by prospecting into new technologies and trends. This results in reinventing the current business units by implementing a strategy based on innovation.

If we look into the evolution of the business model of DSM, we can identify a remarkable change. As a coal company, DSM was owned by the Dutch government. They were only interested in mining coal to keep the industry running. This means that they were using the Type 1 business model (section 2.2.2.) as identified by Henry Chesbrough (2006). Afterwards, we can see that DSM evolved to a more differentiated company (Type 2) in the next step and into the Type 5 (Integrated) business model, as we know it today.

4.2.1. Strategic Process in DSM

In the mid ’90, DSM engaged itself to built a strategy system; this resulted in the start of a strategic planning system. In a first step, this system was called corporate planning. This was a strategic plan for four to five years. In 1993 DSM changed this system into a Business Strategy Dialogue (BSD) where top management would look for the best options for the business groups. In these dialogues, the business groups would be responsible for giving feedback and trying to find solutions for the future. In 2000, DSM transformed these dialogues into a Corporate Strategy Dialogue (CSD). In these dialogues, top management wouldn’t look for the best options for the business groups but it would look for the best option for the company. In the beginning this exercise was done with the board of directors and top management but now it has grown to a strategic exercise where board of directors, top management and management of the business groups are working together to determine the future of the company.

The goal of these CSDs is to determine the strategy of the company for the next five to ten years. In order to do this, the CSD starts with identifying social and technology trends that are occurring in the market. If there are interesting trends, the next step is to combine these trends in innovation pockets. If new, interesting innovation pockets are identified, the CSD will create Emerging Business Areas that will be developed within the company. This process is shown in the picture below.

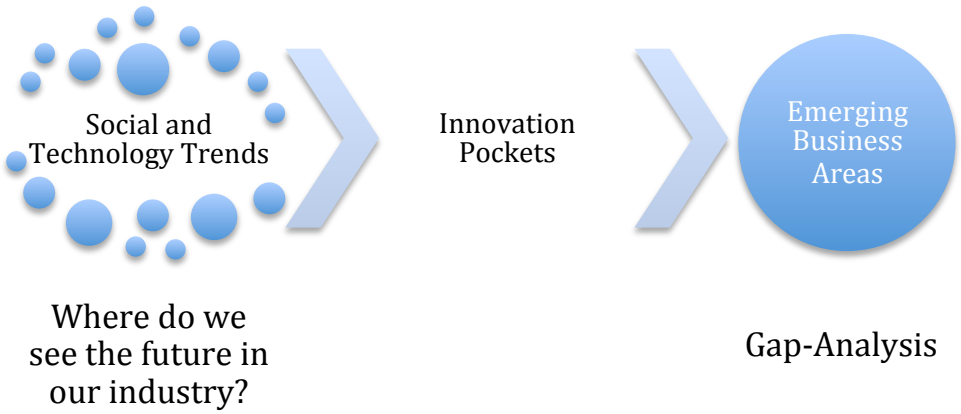

FIGURE 13: CORPORATE STRATEGY DIALOGUE IN DSM

During the first CSD in 2000, it was the goal to determine what would be growth areas for DSM and how they would be able to develop them. This resulted in the creation of DSM Innovation Center. This Innovation Center is responsible for developing the Emerging Business Areas into mature business solution or new business groups. The first four Emerging Business Areas identified by the CSD were Bio-Medical, White-biotech, Special Packaging and Personalized Nutrition.

After five years the CSD will evaluate the progress made on these areas and they will decide whether an Emerging Business Areas is developed further within the Innovation Center, whether it will be transferred to the existing business groups as a new product, whether it will be a new business group if a lot of usage is possible or whether it is broken down and discontinued. The DSM Innovation Center and the Emerging Business Areas will be discussed in detail in sections 4.3.1. and 4.5.

4.3. Innovation in DSM

As mentioned in the previous section, DSM has an innovation-oriented strategy. Within this strategy DSM created a "Global Virtual Lab", with more then 30 R&D units, spread over 25 sites, all affiliated to the different business groups. This lab is specialized on Competence Management, Project Management, Human Resource Management and Information and Knowledge Sharing.

In the last five years, DSM achieved remarkable results on innovation. They generated 1 billion € revenue from innovation, they increased speed of innovation and they implemented a strong innovation infrastructure and culture. Moreover, they have created four Emerging Business Areas and external recognition as leading innovator. But is has to be emphasized that 80% of all innovations in DSM are done within the existing business groups, only 20% is accounted for by the Emerging Business Areas in the DSM Innovation Center.

In the graph below, we can see the innovative capacity of DSM in 2006 and in 2010 compared with the average of the industry.

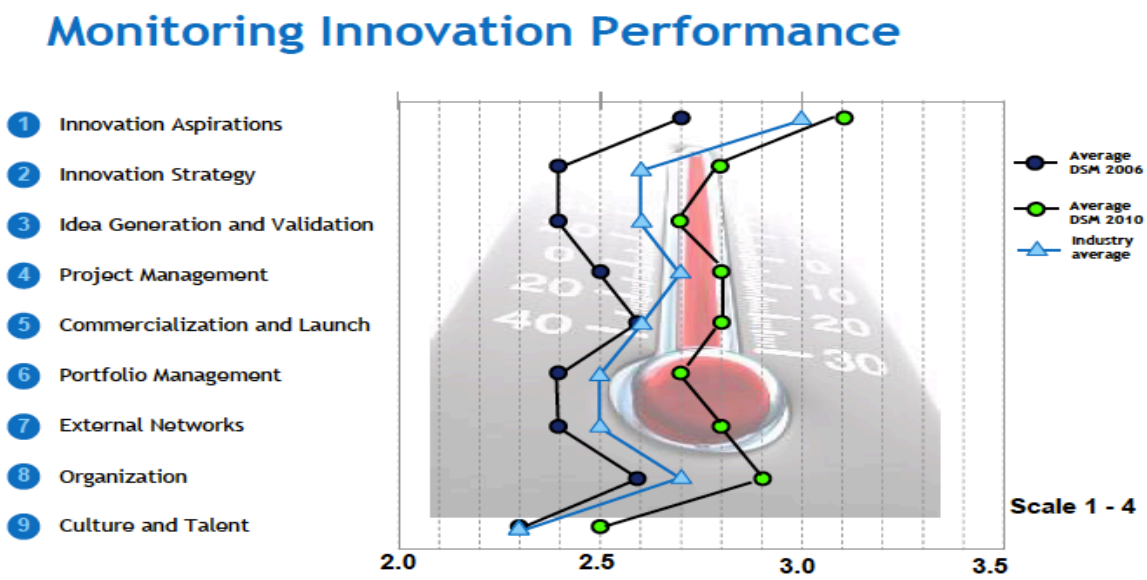

FIGURE 14: MONITORING INNOVATION PERFORMANCE

Source: PDF Rob Kirschbaum

As we can see on the graph, DSM started below the average of the industry in 2006 but increased their quality of innovation to above average by 2010. As we can derive from the graph, DSM is strong in Innovation Aspirations and Organization but has to improve on Culture and Talent, Portfolio Management and Idea Generation and Validation.

DSM has the strategy to improve innovation even more through the company. First of all, DSM wants to find a balance between radical and incremental innovation. Secondly, they want to achieve this by a focused approach through innovation platforms. Moreover DSM wants to create Innovation Centers in India and China, to expand the use of Open Innovation, to improve innovation practices and to support Technology Platforms.

In finding a balance between radical and incremental innovation, DSM uses a portfolio management tool. This tool enables the company to provide a company wide insight into the composition of the portfolio. The portfolio management tool uses a matrix to optimize the mix of incremental and radical innovation. This matrix is shown below.

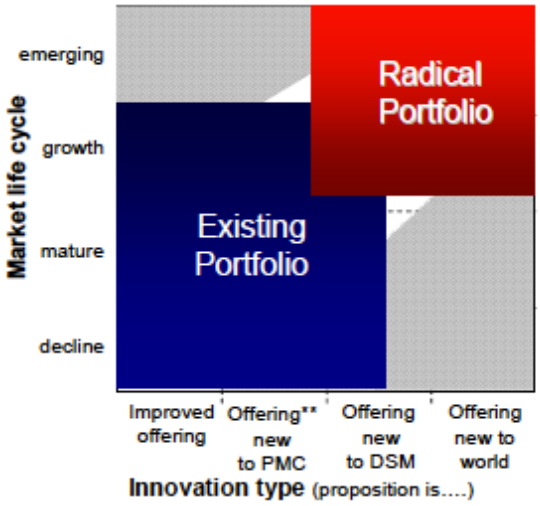

FIGURE 15: PORTFOLIO MANAGEMENT

Source: PDF Rob Kirschbaum

In this matrix, we can identify that innovations in declining, mature and growth markets are part of the existing (incremental) portfolio. Radical innovations are offered to growth and emerging markets with offerings that are new to DSM or new to the world.

DSM focuses its innovation on a well-defined and focused platform and a well-stocked pipeline. In looking for trends or global shifts especially in Climate & Energy and Health & Wellness, DSM shapes its innovation areas. As shown in the figure below, DSM has five business groups namely. Bioprocessing ingredients, Food ingredients, (Bio) Manufacturing, Bio-based clean/green materials and Sports & Life Protection Materials. DSM also has three Emerging Business Areas managed by the DSM Innovation Center namely Bio-based Products & Services (BPS), Advanced Surfaces (DAS) and Biomedical (BM).

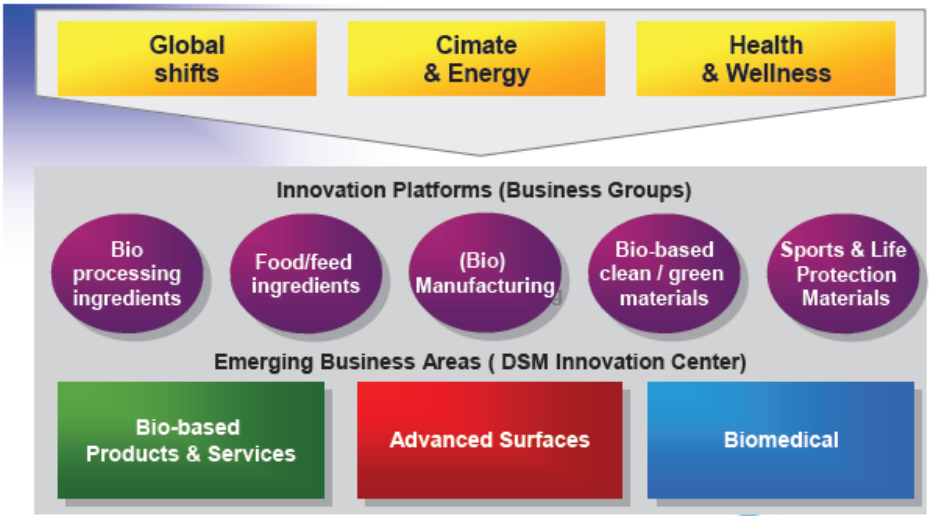

FIGURE 16: INNOVATION PLATFORMS

Source: PDF Rob Kirschbaum.

4.3.1. DSM Innovation Center

As mentioned in section 4.1.2., it is the task of the Corporate Strategy Dialogue to determine which social and technological trends they want to explore in the company for the next five to ten years.

After the first CSD, four new promising Emerging Business Areas were identified: Bio-Medicals, White-biotech, Specialized Packaging and Personalized Nutrition. Because these new business areas weren't yet present within the company, DSM needed to build the necessary competences and infrastructure. To develop new competences and products, the CSD decided to create the DSM Innovation Center. This Innovation Center acts like a global incubator to connect to the needed competences, technology and infrastructure to be able to develop the Emerging Business Areas during the first five to ten years.
In the DSM Innovation Center, DSM reviews the current competences by performing a gap analysis. Afterwards they will use the Open Innovation model to attract and absorb competences that aren't present within the company today.

In the CSD of 2000, it was decided that DSM would release the Polyethylene and Polypropylene business. Because this would force 2500 DSM employees to leave, DSM decided to create Chemelot to maintain the same amount of jobs for the region and to create an environment that stimulates the cooperation between companies in the same

industry. Today, Chemelot is an industrial park housing different chemical and material companies and also a campus where knowledge can be shared and developed further. Today, Chemelot is one of the largest chemical and material communities in Europe with more then 80 companies on site and even 41 new companies since 2005. Most of the companies in Chemelot are global leaders in their product market combination. In the figure below, we can see how Open Innovation is used at Chemelot.

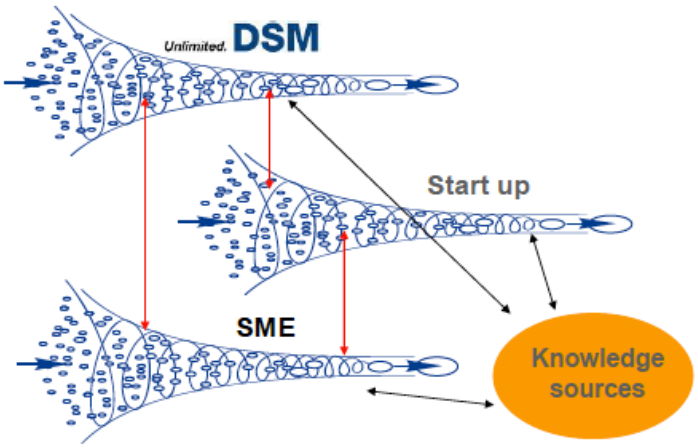

FIGURE 17: OPEN INNOVATION AT CHEMELOT

Source: PDF, Rob Kirschbaum

As we can see on the figure, companies at Chemelot can connect to each other as well as to knowledge sources present in the campus of Chemelot. In some cases, ideas or new technologies are developed in the funnel until a new start-up company is created. This start-up is then located at the Chemelot site with the opportunity to connect to other SME's within Chemelot. This enables not only better and stronger cooperation between companies in the same industry but also the generation of new ideas to a start up. For DSM, this set-up means that they can gain a competitive advantage over the competition because close cooperation, follow up and idea generation is enabled.

To be able to absorb competences, which are needed in the company, DSM decided to create DSM Venturing. This means that DSM is looking for opportunities to partner & invest in innovations for a healthy and sustainable living. DSM Venturing is composed of two parts namely Portfolio Funds and Portfolio Direct Investments.

Portfolio Funds are funds in which DSM participates. This means that together with other companies DSM will look to opportunities to invest in. This can be start-up or

even investing in universities to develop a new technology. By using such venture funds, DSM can spread the risk of developing new technologies with different partners. The portfolio funds of DSM are presented below.

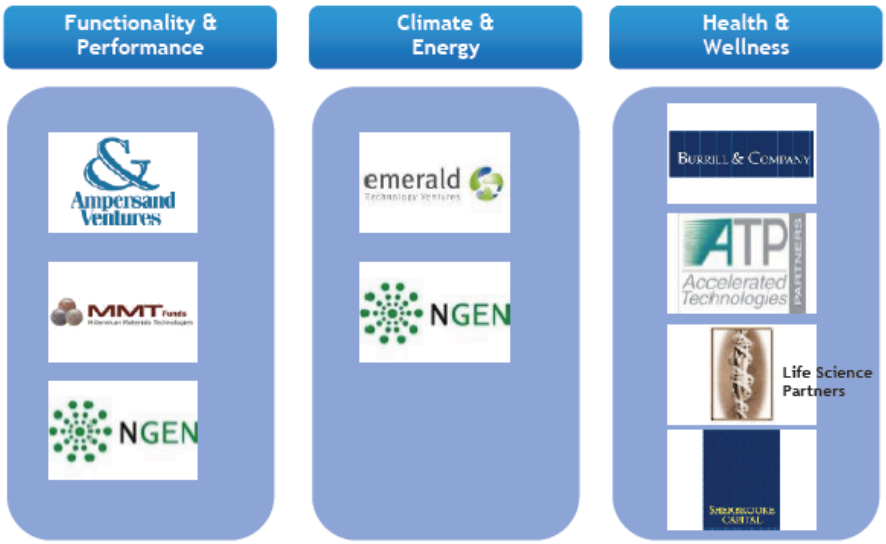

FIGURE 18: PORTFOLIO FUNDS

Source: PDF Rob Kirschbaum

The Portfolio of Direct Investments means that DSM doesn't use a fund with other companies but will invest directly into a start up or a new technology. This portfolio consist of product or companies with products related to the product or strategy scope of DSM that were so promising that DSM decided to invest directly. Some of these direct investments are presented in figure 19.

FIGURE 19: PORTFOLIO OF DIRECT INVESTMENTS

Source: PDF Rob Kirschbaum

In the CSD of 2010 it was decided that Personalized Nutrition and Special Packaging were discontinued. Bio-medical and White-biotech (now Bio-Product services) were continued and a third Emerging Business Area was created: Advanced Surfaces. These Emerging Business are at the moment still in development in the DSM Innovation Center. They are considered as the new growth platforms of DSM for the next five to ten years. DSM has the aspiration to increase sales of these Emerging Business Areas to 1 billion € with a high EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) margin.

4.4. Difference Innovation in the Business group and in the Innovation Center

As mentioned before, we can see that DSM evolved into a more differentiated company (Type 2) and in the next step into a Type 5 (Integrated) business model, as we know it today. If we look into the innovation process in DSM we can see that innovation directly related to the business group is done within this business group. This means that the innovation is connected to the business model of the business group. Moreover, by interviewing Rob Kirschbaum and Jos Put we identified that Intellectual Property management is viewed as a financial asset and is defended vigorously.

If we look to the business model of the DSM Innovation Center we can identify a Type 6 (Adaptive) business model. In theory, this means that the Innovation Model will identify a new business model. Moreover, we can identify that Intellectual Property developed within the DSM Innovation Center is viewed as a strategic asset. DSM uses a different place to conduct innovation and a different business model for innovation for the Emerging Business Areas and innovation for the running businesses.

First of all, there is the difference between the innovation in the running businesses and the innovation in the Innovation Center. Because the Innovation Center is regarded as a global incubator for new technologies and new products, it needs a different approach than the running businesses. As mentioned before, the Innovation Center needs to build the necessary competences and the running businesses already possess these competences. Because more time is reserved for the Emerging Business Areas, the Innovation Center can develop more possible products and doesn’t have the pressure of developing new products in the short term.

A second difference is the use of a different business model. This is implemented because the business model of the running business is too dominant in looking for products that fit the business groups. This would result in the fact that an Emerging Business Area is transferred to quickly to a business group for developing a new product, missing opportunities for more business groups. In the Innovation Center the Emerging Business Area gets the time to develop as much products for as many business groups as possible. This enables the company to develop more new products or technologies then it would if it was using the business model of the running businesses.

A third difference is the use of a new management team for developing Emerging Business Areas. In the running businesses the current management team is also responsible for the innovation management, which contributes to a narrow focus on developing products for their own business group. In the Innovation Center, an experienced management team is put together which is capable of dealing with the uncertainties of an Emerging Business Area and which is capable of developing as much applications of a new technology as possible. DSM will choose a management team that already has been responsible for a number of business units or strategic areas.

The biggest difference between innovation in the business unit and in the Innovation Center is that in the running businesses the management is looking to strengthen factors of success. As mentioned in chapter three, this is the exploitation theory in strategic renewal. But in the Innovation Center we use the exploration theory. This means that the Innovation Center has to determine which technology will prove to be successful, which markets it needs to develop and which customers needs it needs to target.

An example of this process is the transition from fossil fuels to bio-fuel. First of all, DSM needed to look which technology would fit the company strategy and which technology would prove to be successful in the long run. In the field of renewable energy, there were three options namely wind-generated energy, solar-generated energy and bio-fuels. DSM chose bio-fuels because it fits the company strategy best. In this field, there was the first technology wave, which was using bio-ethanol as fuel. Because crops that before were used for food were needed to create bio-ethanol, DSM chose not to develop this technology. Instead, DSM chose to develop a second technology. This technology uses rest material of crops to develop fuel and is not in

competition with crops used for food purposes. This resulted in the creation of a pilot plant and if this proves to be a success, DSM will commercialize this new technology on the market.

Again, we can identify a difference in the use of partners. In the running businesses, DSM will look for partners based on their own business model. For instance, they have a global venture with SINOCHEM in China. This was the result of an analytical exercise that would help the running businesses in their strategy to develop innovative products. This means that DSM is looking to consolidate their position in the running businesses. In the Emerging Business Areas, we can see that the selection of a partner has a lot of uncertainty and is more regarded as looking for complementarity with partners. They don't know the characteristics and strengths of the partner. But the process of looking for complementarity is the same.

A first example of this process in the Innovation Center is the partnership between DSM and Roquette. DSM had the technology but didn't have a good position to attain commodities and Roquette didn't have the technology but had a good position on the commodities market. Because of this partnership they were able to bring their strengths together to develop a new product. A second example is the partnership between DuPont and DSM in the Emerging Business Area Biomedical. DuPont had developed a new portfolio of ideas and wanted to work together with DSM because of their competences in bio-medical devices. This resulted in the creation of a Joint Venture called Actamax Surgical Materials LLC. In this partnership it was agreed that if the development would be a success, DSM would have the right to commercialize this product.

4.5. Innovation Center and Corporate Renewal

In DSM's strategy, the company identified six competence areas. Within these competence areas they prospect the market for technology and social trends. If new promising trends are found on the market, DSM will create innovation pockets. In the next step the company will perform a gap analysis. This means that DSM will review what competences and technologies are present within the company and which competences need to be attained from other companies. After this analysis DSM creates an Emerging Business Area (EBA) to develop, within the DSM Innovation Center, the competences it lacks. Emerging Business Areas can be considered as a

portfolio of different projects. From one Emerging Business Area, the DSM Innovation Center has to develop as much products or new technologies as possible.

Every Emerging Business Area has a synergy with the existing business groups. Starting from the gap analysis, DSM will use the funnel of the Open Innovation model to attract missing competences. Starting with a lot of different ideas, DSM will select the most promising ones. Because it wants to turn an Emerging Business Area into a mature business as soon as possible, the DSM Innovation Center will use the Open Innovation model to look to existing partners and new partners for joint business developments, licensing in, venturing, spin in or acquisition. On the other hand there is the possibility to externalize ideas or competences as R&D services, licensing out, spin out/off or even divestments. By selection opportunities that fit the Emerging Business Areas will enable DSM to turn the Fuzzy Front End into a well-defined Front End, resulting in a new product or technology base. This enables DSM to evolve into a well-defined Rear End, which will lead into the development of a new product. This process is shown in the figure below.

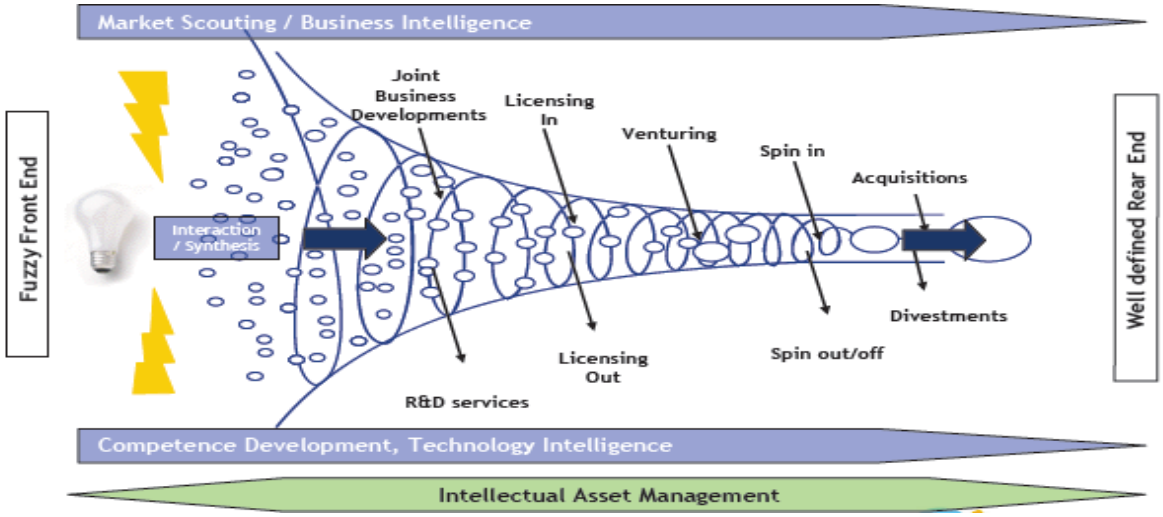

FIGURE 20: OPEN INNOVATION MODEL OF DSM

Source: PDF Rob Kirschbaum

An example of this process is the Emerging Business Area Biomedical. In scanning its potential partners, DSM started a partnership with BP. But in the long run, DSM considers this partnership as crucial and it will try to acquire BP's Chemical department.

4.5.1. Emerging Business Area: Bio-Based Products & Services

The goal of DSM in this first Emerging Business Area is to become a leader for integrated technologies in the field of Advanced Bio Energy and to develop and produce Bio-Based Chemicals & Polymers. (DSM website, 2011)

The trend that started this Emerging Business Area is the fact that the world is running out of oil and that a lot of development is done in this field. Complementing the internal knowledge with outside specialism, DSM participates in various Public Private Partnerships on a global scale in the field of Industrial Biotechnology. These partnerships are presented below.

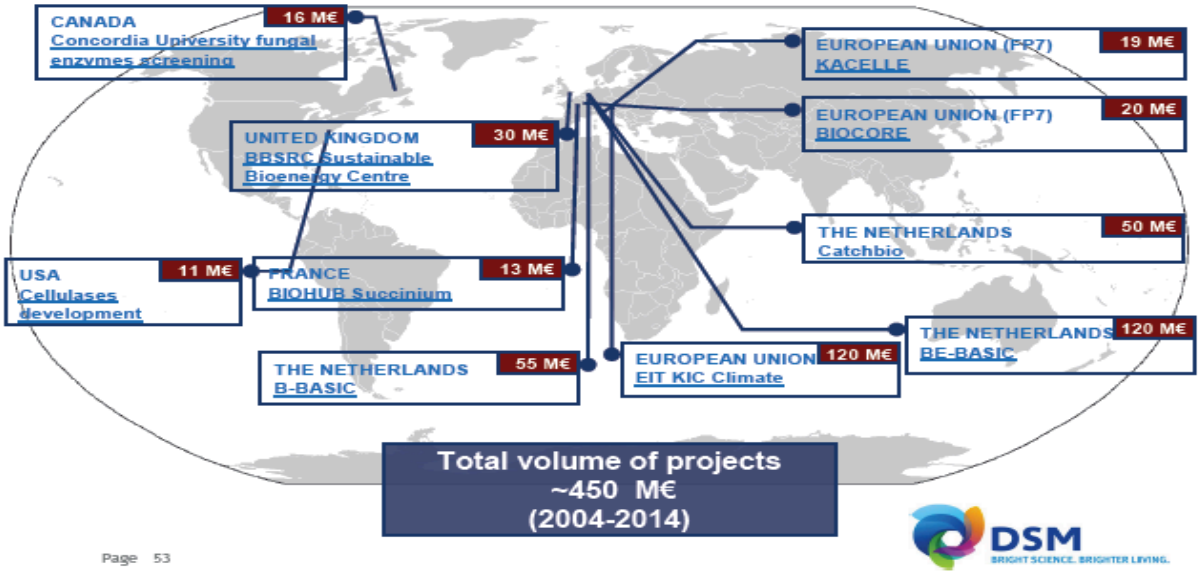

FIGURE 21: PUBLIC-PRIVATE PARTNERSHIPS OF DSM

Source: PDF Rob Kirschbaum

Because DSM needed to build competences first, they had to connect to partners in the front-end of the innovation funnel. In this early phase, DSM identified partners that already did research in this field and would share this knowledge with the company.

This approach enables DSM to decrease the financial impact for the company if the project would fail. Secondly, it reduced DSM expenditure for achieving project deliverables. Thirdly, because of the publicity of the subsidy program DSM managed to build a sustainable image of the company that helped position it in a new field. Additionally, this first partnership can be a first step towards full-fledged business relationships. The last and most important benefit for DSM was the ability to access

new ideas and knowledge. This was done by partnerships with leading research institutes.

In the first phase of the partnerships, DSM was able to build the necessary competences and infrastructure. This resulted in the identification of a promising technology namely: Biomass from agriculture waste as a feedstock. This resulted in the creation and development of one system and one program. First of all, there is the DSM Cellulosic Enzyme System & DSM's Advanced Yeast Program. In these projects, DSM is looking for an opportunity to develop a new way of extracting cellulosic ethanol of rest material of crops.

Because DSM wants to be a sustainable company, they have changed the business model for delivering the bio-fuel to companies. Instead of transporting bio-fuel over the road or over water, DSM has chosen to do on site manufacturing of Enzymes and Yeast. This decreases the carbon dioxide footprint in developing this new product.

A second product that was developed in this Emerging Business Area was a Bio-based chemical namely succinic acid. This is currently used in coatings, engine coolants and pharmaceuticals. But now DSM is able to change the oil-based succinic acid with the bio-based succinic acid. This results in decreasing costs and Greenhouse Gas emissions reduction of more then 60%. Because of this change, DSM was also able to develop new applications, as shown in figure 22. This also enabled DSM to broaden its current innovation portfolio. But because another process is used, DSM needed to start a partnership with a company that had a good position to attain the needed commodities in this process. As a result DSM started a partnership with Roquette.

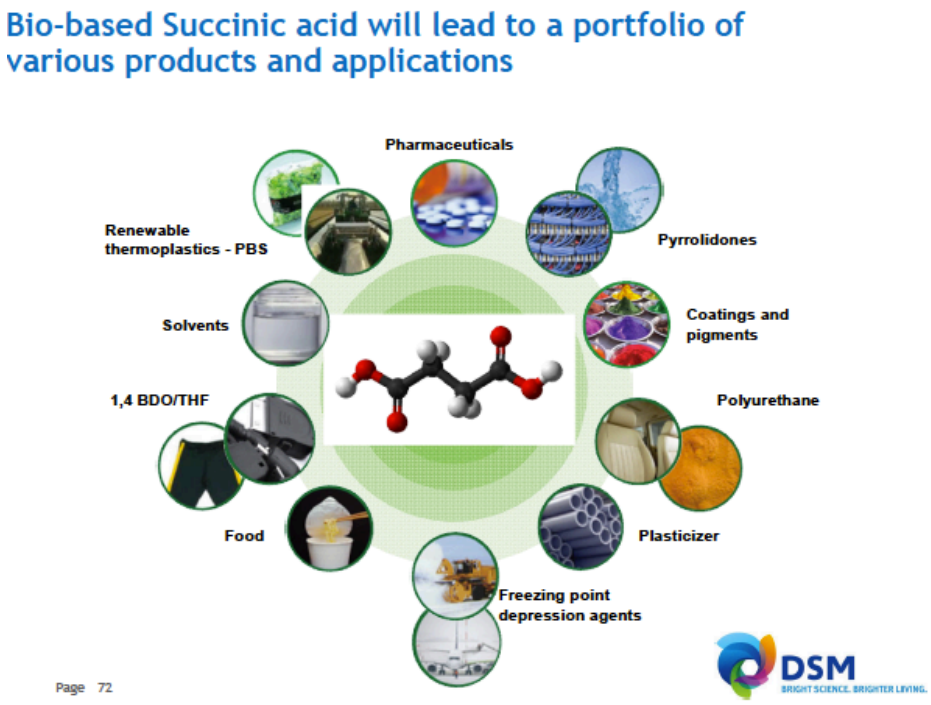

FIGURE 22: NEW APPLICATIONS FOR BIO-BASED SUCCINIC ACID

Source: PDF Rob Kirschbaum

A third product developed in this Emerging Business Area is EcoPaxx™. EcoPaXX™ is a bio-based, high performance engineering plastic. It has high-performance polyamide that combines the benefits of a high melting point (approx. 250° C), low moisture absorption and excellent resistance to various chemical substances, including for instance road salt. Approximately 70% of the material is based on building blocks derived from castor oil, a renewable resource. Because of the characteristics of this product and the process with which it is made, DSM is able to reduce the Carbon footprint. This product is at the moment used in the automotive industry.

A fourth product in this Emerging Business Area is Palapreg®ECO. Palapreg® ECO is a bio-based resin for automotive vehicle body parts, including exterior panels. It is composed of 55% renewable resources, making it the composite resin material with the highest bio-based content available on the market today. Industry testing has proven that DSM has been able to achieve this high renewable content without making any sacrifice to product performance or production speeds. This product and EcoPaXX™ helps the automotive industry to attain its sustainability targets.

A fifth product developed in this Emerging Business Area is Arnitel ECO. Arnitel ECO is a thermoplastic elastomer. This product is developed by this Emerging Business Area

but has been transferred to the business group DSM Engineering Plastics. At this moment, it is used on the vibration dampers of the bobsleigh of the Dutch bobsleigh team.

Additionally, DSM identified that the Bio Materials Value Chain is emerging. The value chain is presented in the figure below. As we can see in this figure, DSM has built a strong position in this value chain by developing this Emerging Business Area. Because the company has built this position, it already has a competitive advantage over the competition.

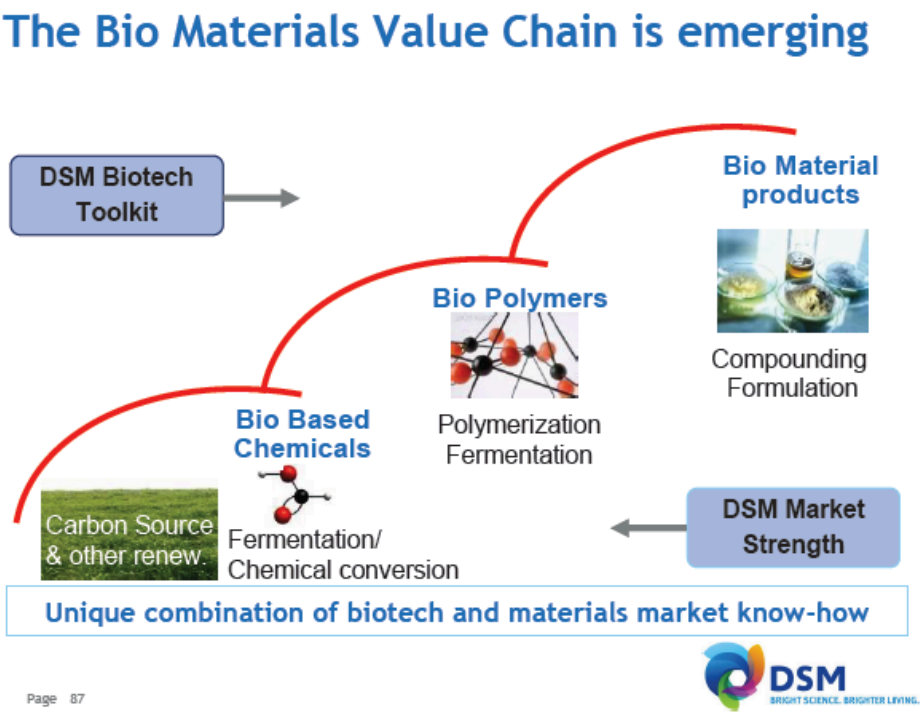

FIGURE 23: THE BIO MATERIALS VALUE CHAIN IS EMERGING

Source: PDF Rob Kirschbaum

To ensure the position of DSM in this Emerging Business Area and to stimulate the development of new products, DSM has started four venturing participations.

The first venturing participation is with Tianjin Green Biosciences. They are specialized in Poly Hydroxy Alkanoates and have a design capacity of 10 Kilotons per year. The second venture is with Novomer. They are specialized in Aliphatic Polycarbonates and Adhesives and have a capacity of five to ten metric tons per year. The third venture is with Segetis, which is specialized in Levulinic Ketals and has a capacity of more then

one hundred metric tons per year. The last venture in this Emerging Business Area is Verdezyme. They are responsible for developing Advanced Yeast technology.

As we can see from this Emerging Business Area, DSM starts with one trend it wants to follow and ends up with different products that are developed for different business groups. This was also the fact with Dyneema. But this Emerging Business Area became so strong that DSM decided to create a business unit DSM Dyneema. Later, Dyneema was transformed into a business group which now produces Dyneema Purity, artificial hips, coating and stents to be used in heart surgery.

4.5.2. Emerging Business Area: Biomedical

In this Emerging Business Area, DSM want to become the preferred service provider in the medical device industry by offering innovative bio-passive, bio-active and bio-interactive materials to improve performance and life. (DSM website, 2011).

To achieve this position DSM created a Strategic Pathway (figure 24). Because of partnerships built in the field of biostability with Medical Coating and Polymers, DSM was able to the next strategic field namely Biocompatibility. In this field they were able to create Trancerta™ Drug Delivery, which made DSM the preferred partner for the Pharmaceutical and Medical Device Industry. Because of the knowledge in these areas, DSM was able to build the next step in the strategy namely moving to the Bio-Interactive field. In this field DSM wants to develop Therapeutic Materials and Regenerative Medicines.

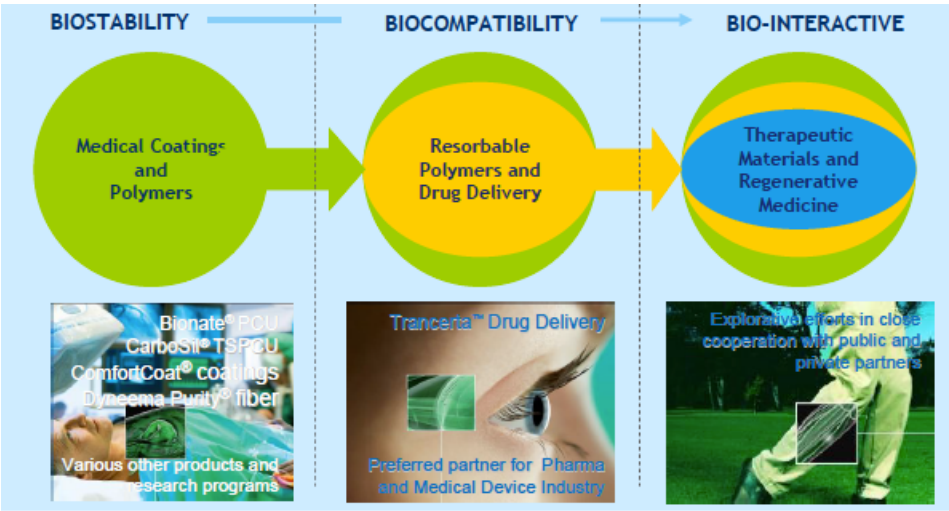

FIGURE 24: STRATEGIC PATHWAY

Source: PDF Rob Kirschbaum

Because DSM doesn't possesss the necessary knowledge, they are looking for public and private partners. In the figure below, we can see that DSM acquired the Polymer Technology Group as a part of DSM Biomedical to build a unique portfolio of novel polymer-based solutions. To accomplish this DSM will use the Open Innovation Approach to speed up developments and to attain a long-term, sustainable position on the market. In the figure below, we can see how DSM is using Open Innovation in this Emerging Business Area.

FIGURE 25: OPEN INNOVATION IN PRACTICE

Source: PDF Rob Kirschbaum

As we can see on figure 25, DSM has created an Open Innovation process within the company. First of all, DSM will actively complement its competences with the necessary competences and infrastructure by using partners. It will be the task of the Scientific Advisory Board to decide in which technologies DSM is willing to invest and to which partners they have to look to attain the necessary competences and

infrastructure. DSM tries to build competences by using research institutes, like BMM and CTMM, to form alliances or cooperations. Afterwards it will look for the right partners to develop a new technology by using licensing, venturing (Harland Medical Systems, XYLOS and ATP) and as a last option an acquisition or a merger (Polymer Technology Group). Because of these partnerships DSM will be able to develop the Emerging Business Area internally.

Because of these partnerships, DSM was able to detect a new application of Dyneema® Purity. In this new application DSM was able to develop a device to improve the fixation of transplanted ligaments in the knee. This new application is now used within the DSM Dyneema business unit. Additionally, we can see that DSM has created a pipeline of products at all stages of development. These include Polymer platforms for artificial hips and knees, materials for silicon hydrogel-contact lenses, Polymers for heart assist devices and Trancerta ™ (DSM website, 2011).

4.5.3 Emerging Business Area: DSM Advanced Surfaces

The Emerging Business Area Advanced Surfaces of DSM has the goal to be a solution provider for the development and application of smart coatings & films. (DSM website, 2011)

In this new Emerging Business Area DSM is focusing its research and competence building on three different areas namely anti reflective coated glass for picture framing (Claryl®), solar cell cover glass and outdoor applications of anti reflective glass (DSM website, 2011). Because this Emerging Business Area is still in the early phase, DSM needed to identify potential partners to develop new competences and products. This resulted in the development of Claryl®, which is an anti-reflective coating for picture framing. This application is developed far enough to be transferred to a business group.

A second result is the purchase of a nanotechnology patent application, which was owned by the University of Sheffield. Because of this patent DSM gains access to Novel Technology that provides a broader technology and Intellectual Property platform. Moreover, DSM enabled cooperation with the University of Sheffield to develop this technology further for specific application and markets. Additionally, the potential of this technology enables DSM to meet future customer needs and to be innovative for the next five to ten years.

Because of this cooperation and the acquisition of the patent, DSM was able to develop a first application. The DSM Innovation Center was responsible for developing an anti-fouling, anti-bacterial and anti-fogging coating for solar glass called Khepricoat™. Claryl® and Khepricoat™ are just the first two launched products of a completely new area for DSM. In the future DSM will create more products in the Emerging Business Area Advanced Performance Coating.

4.6. Conclusion

First of all, we can say that the Emerging Business Areas play a vital role within DSM. This results in the usage of Corporate Strategy Dialogues (CDS) to determine in which technology DSD wants to invest. This enables the support of top management as well as lower management to decide on the future of the company. Within DSM, an Emerging Business Area is an opportunity for new business - and new product development.

After deciding which Emerging Business Areas will be created, DSM will use a gap-analysis to review their current competences with the needed competences. After deciding which competences DSM needs to attain, the management will use their innovation network to connect to the right partners. Within an Emerging Business Area, DSM hopes to develop new technology or new products that will contribute to the growth of the company. If an Emerging Business Area is developed into a mature business, DSM will transfer the Emerging Business Area into a Business Unit or if large enough a Business Group.

Secondly, it’s important to point out that the structure of the DSM Innovation Center enables the successful development of Emerging Business Areas. Because the DSM Innovation Center is located outside the running businesses, DSM is able to provide time, resources and management expertise into the development of Emerging Business Areas. Because of this structure, DSM can create a separated but experienced management team that is responsible for developing an Emerging Business Area. Additionally, it can give an Emerging Business Area more time for developing than in the running businesses. But the management of the Innovation Center has also the responsibility to transfer a new product as soon as it is develop enough. A last advantage of using the DSM Innovation Center is that it has a special financial treatment within the company.

Thirdly, we can see that Open Innovation plays an important role within the Emerging Business Areas. As mentioned during this chapter, DSM is looking for partners to develop an Emerging Business Area. By using the processes of Open Innovation, DSM is able to connect to the right partners. An example of this is the Emerging Business Area Bio-Medical. In this Emerging Business Area, DSM has used to processes of Open Innovation to use research alliances & cooperation, venturing and licensing to connect to partners that possesssed the needed competences and expertise.

To conclude this chapter, we can say that DSM has successfully used Open Innovation for years but by using it in Corporate Renewal, the company will be able to expand their business and to attain a first-mover advantage over the competition.

Chapter 5: Case Study Janssen Pharmaceutica

In the second case study I will investigate Janssen Pharmaceutica. Janssen Pharmaceutica is responsible for the production of all medicines and related consumer products for the Johnson & Johnson group and is known as one of the most innovative pharmaceutical companies in the world. The company is committed on delivering breakthrough medicines and has introduced a range of innovative treatments such as schizophrenia, epilepsy and most important AIDS. Janssen Pharmaceutica is also specialized in pain management, fungal infections, cancer, etc. I have chosen this company for the sector in which it is operating. As mentioned before, the pharmaceutical sector (section 2.2.3.) has a lot of problems with the changing economical environment. By researching Janssen Pharmaceutica I am able to give an overview of how a multinational is using Open Innovation in Corporate Renewal to cope with this changing environment. To write this chapter I interviewed Eric Snoeckx, Director of the Janssen Campus Office and Tom Aelbrecht, Director of the Venture and Incubation Center.

Because Open Innovation is only recently introduced in this company, I will start by introducing the story of Janssen Pharmaceutica with their strategic transformation in 2008. Afterwards I will elaborate on the creation of the Janssen Campus Office. Next to that, I will look into the business model used for innovation within the running businesses and the business model used for innovation at the Janssen Campus Office. In the third section, I will examine how Janssen Pharmaceutica uses Open Innovation in Corporate Renewal with attention to the management of this process and the use of a Venture Capital department for funding internally and externally generated ideas. To end this chapter I will provide the reader with a short conclusion.

5.1. Strategic Transformation: a first step in Corporate Renewal

A first remark that has to be made is the fact that the pharmaceutical sector cannot be compared with any other industry. As mentioned before in section 2.2.3., pharmaceutical companies have to make huge investments to develop medicines. Ten to twenty years ago the investments related to drug development were estimated between 100 and 300 million dollars. All research was done within an R&D facility as the one in Beerse for Janssen Pharmaceutica. In the last ten years however, the cost for developing new medicines has reached up to 2 billion dollars. Furthermore we can

see that the patenting process for new medicines has gotten more time consuming and more costly and as in every industry not all the knowledge is present within Janssen Pharmaceutica. This means that pharmaceutical companies have to look outside the company to gain knowledge to develop innovative products and medicines. This changing reality forced Janssen Pharmaceutica to change their strategy in 2008 and resulted in the creation of an Open Innovation Center in 2010.

The transformation of Janssen Pharmaceutica's strategy was started by the current CEO Tom Heyman. He identified that the current strategy of the company had a narrow focus on researching and developing medicines and that the company forgot the people that would use their products. The new strategy, called Integrated Customer Centric Therapeutic Solutions, was built on a new view on providing help for all people not only patients. From 2008, Janssen Pharmaceutica wasn't only a pharmaceutical company responsible for developing medicines but they were also responsible for early diagnosing, targeted treatment, Care Giver programs and even after care. Moreover, for the first time a pharmaceutical company targeted healthy people to be able to help them even before they were sick by implementing personal profiling. This transformation from a product centric strategy into a product and patient centric strategy is shown in figure 26.

FIGURE 26: A NEW ERA OF HEALTHCARE

Source: Open Innovation folder, Janssen Pharmaceutica

As shown in the figure above, we can see that Janssen Pharmaceutica transformed their current model of basic research, preclinical and clinical development, supply chain and commercialization into an integrated health care model. To succeed in this transformation Janssen Pharmaceutica has to create new healthcare models, new collaboration models and most importantly new business models. This means that Janssen Pharmaceutica not only has to change its internal structure but also needs to change the environment in which it is operating. To implement this new strategy through the whole company, the new CEO also formulated a new mission and vision (figure 27) that is known by heart by all the employees at Janssen Pharmaceutica.

FIGURE 27: JANSSEN PHARMACEUTICA'S MISSION AND VISION

Source: Open Innovation folder, Janssen Pharmaceutica

In this mission and vision, Janssen Pharmaceutica emphasizes five values. The first value, innovation, forms the basis of the company. Because Janssen Pharmaceutica is known as an innovative pharmaceutical company, they will do their utmost to keep creating, developing and delivering ground-braking therapeutic solutions that will make a difference. Furthermore, Janssen Pharmaceutica wants to create value for all their stakeholders: not only patients and the environment but also for its employees. Janssen Pharmaceutica wants to create this value by encouraging entrepreneurship and collaboration with outside companies. As a first step Janssen Pharmaceutica created an open entrepreneurial community to focus on activities with a huge added value. Additionally, they also support an open mind within their company.

In reality this mission and vision was translated into the creation of an Open Innovation Center, named the Janssen Campus Office (section 5.2.).

5.2. Janssen Campus Office

5.2.1. Janssen Campus office strategy

As mentioned in the previous section, the new strategy obliged Janssen Pharmaceutica to think about the healthcare model, their collaboration models and their current business model and competences. Because the new strategy implements four new business areas namely Personal Profiling, Prevention Programs, Care Giver Programs and After Care, Janssen Pharmaceutica has to look to partners to attain the necessary competences. To connect to the right partners, Janssen Pharmaceutica created the Janssen Campus Office.

To align the Janssen Campus Office with the new strategy, Janssen Pharmaceutica made a separate mission and vision to enable new cooperation with other companies. In this mission and vision the Janssen Campus Office wants to create value by exploring and connecting with the external environment, collaboration networks and new synergies. Moreover, the Janssen Campus Office has to be the first point of contact between Janssen Pharmaceutica and other companies. They also have to facilitate and guide open collaboration partnerships, attract external capabilities and expertise and provide business development guidance for innovative business ideas and ventures. Key activities of the Janssen Campus Office are presented in figure 28.

Janssen Pharmaceutica also wanted to build a sustainable Open Innovation network, by using an Open Innovation policy. Janssen Pharmaceutica built this policy by stating that every partner has to be located within one-day travel of the Janssen Pharmaceutica campus. Because of this Janssen Pharmaceutica wants to decrease its carbon footprint. This Open Innovation policy differs from the policy of the DSM Open Innovation Center and many other Innovation Centers in the world because of the fact that they are looking for partners close to their campus. Moreover, Janssen Pharmaceutica, in comparison with DSM and Chemelot, doesn’t give the option of creating a joint venture at the campus.

FIGURE 28: DEVELOPMENT OF SUSTAINABLE CONSUMER CENTRIC HEALTHCARE SOLUTIONS

Source: Open Innovation Folder, Janssen Pharmaceutica

5.2.2. Difference in Business model

Because working in a new strategy means connecting to new competences and infrastructure the Janssen Campus Office was obliged to create a different business model then the existing businesses.

If we look to the business model of the existing businesses, we can identify a traditional pharmaceutical business model namely: a type 4 (Segmented) business model. This means that the business model is built on one patent connected to one product with exclusive rights for twenty years. This means that the business model is rather closed then open. This results in the fact that the running businesses are externally aware, resulting in the responsibility to innovate themselves to develop new competences that fit the business group strategy. In this business model, Janssen Pharmaceutica supports the use of outside partners. But as mentioned before, a lot of resources need to be invested in the development of medicines, this results in a defensive Intellectual Property management. The running businesses of Janssen Pharmaceutica will do their utmost to keep the Intellectual Property exclusively within the company.

But this business model cannot be used by the Janssen Campus Office in connecting and developing new competences and infrastructure. Because of the open nature of cooperation, the Janssen Campus Office uses a Type 6 (Adaptive) business model. First of all, this business model enables the innovation model to determine which cooperation model should be used (section 5.3.1.). Moreover, Intellectual Property cannot be defended as in the running businesses. This results in a more strategic Intellectual Property management. Because of the open nature of the business model, Janssen Pharmaceutica is able to connect to outside partners without interfering with the closed business model of the traditional pharmaceutical companies.

In a first step, the running business will determine in which field of interest they want to build new competences and infrastructure. Afterwards, the running business will contact the Janssen Campus Office with the request to build an innovation network to connect to these required competences and infrastructure. This means that the Janssen Campus Office is responsible for all external innovation of the new strategy for the running business areas. After determining whether they want to build these competences internally or externally and which cooperation model to use (section 5.3), they will then connect to innovation networks and consortia of universities and companies. If a strong network is built with partners that are willing to cooperate with Janssen Pharmaceutica, this cooperation will be set up using the management of the running business. This means that the building of new competences isn't managed by creating a new management team. Only with projects running in the Venture & Incubation Center (section 5.3.) a new management team will be created.

An example of the start of this process was given during an interview with Eric Snoeckx. The Janssen Campus Office got the request of a business group to connect to partners for analytical knowledge about proteins. This field of expertise was determined as high potential by the business group. After the request, the Janssen Campus Office first reviewed, using the different matrices (section 5.3.). There was money available but it would take years to build the necessary competences. Because of this, the Janssen Campus Office decided it wasn't going to build these competences itself but would look for partners. The Janssen Campus Office started looking for a partner that has this knowledge and they found out that a university in England had the desired competences. Because this university was looking for an analytical medical device, which was owned by Janssen Pharmaceutica, both partners agreed that the medical device was transferred to the university and in exchange Janssen Pharmaceutica would use the analytical knowledge of proteins of the university. In this

situation Janssen Pharmaceutica used Open Innovation to connect to a knowledge partner and creating a win-win situation for both.

A unique possibility of the Janssen Campus Office is the connection through the internal organization. This means that Janssen Pharmaceutica isn't only looking outside the company but is also looking at the different segments of the Johnson & Johnson family, as we can see in figure 29. This means that the Janssen Campus Office needs to connect to different parts of the Johnson & Johnson family. Before these affiliates were considered as non-connecting but with this changing strategy, there is an overlap between competences. This enables Johnson & Johnson to connect different affiliates to share their competences and infrastructure.

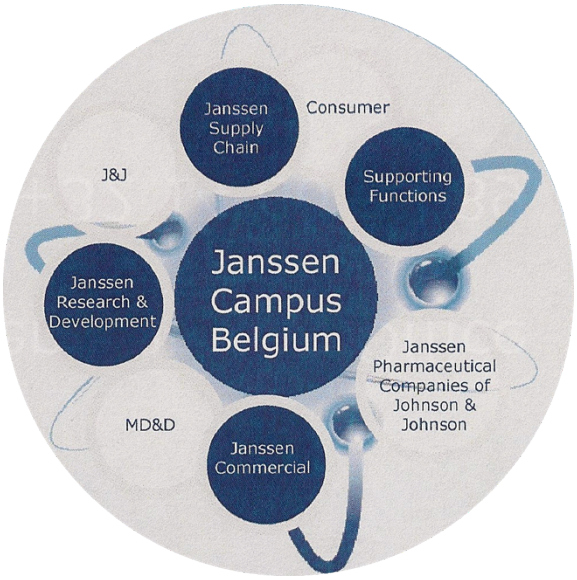

FIGURE 29: JOHNSON & JOHNSON AFFILIATES

Source: PowerPoint Janssen Pharmaceutica

This means that if Janssen Pharmaceutica has developed a new protein or has developed a new usage of an existing protein that they will look to the J&J food department, to its Supply Chain and to other pharmaceutical companies within the J&J family. Because of this Janssen Pharmaceutica isn't only able to generate value to its own business but it will possibly create value for the whole group.

5.3. Management of the Janssen Campus Office

5.3.1. Gap-analysis

As mentioned in the first section, Corporate Renewal was initiated by the strategy transformation in 2008. CEO Tom Heyman reinvented Janssen Pharmaceutica and started an era of integrated healthcare. To attain possible partnerships Janssen created an Open Innovation Center, which had the goal to connect with possible partners to obtain new competences. Now we will look into the processes and management of the Janssen Campus Office to obtain these new business areas and competences.

In a first step, the Open Innovation Center created a matrix, figure 30, to perform a gap-analysis. This is a tool to review the current competences and knowledge available within Janssen and the competences that need to be obtained. This enabled Janssen Pharmaceutica to identify in which business units and competences they need to invest and which can be released from the company. This is illustrated in the following matrix.

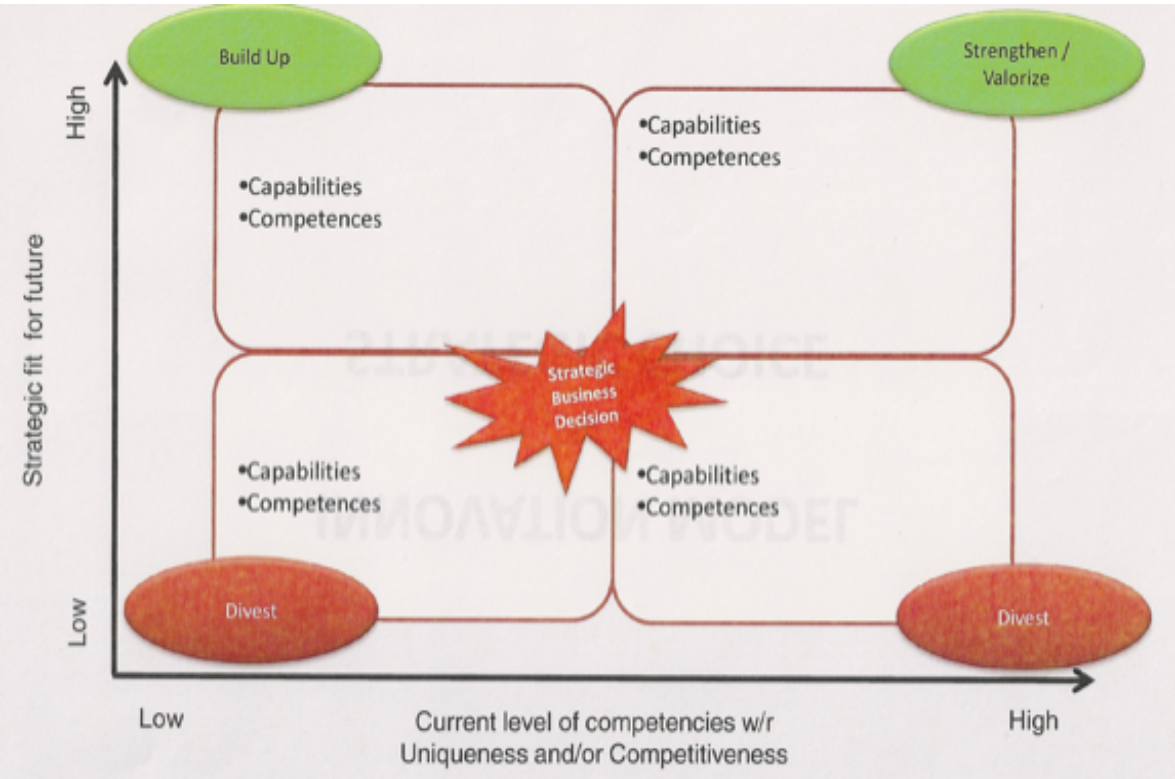

FIGURE 30: GAP-ANALYSIS

Source: PDF, Janssen Pharmaceutica

In this matrix, Janssen Pharmaceutica can examine the strategic fit for the future on the vertical axes and the current level of competences on the horizontal axes.

1. High strategic fit for the future but the level of competences is low within the company: In this case Janssen Pharmaceutica will choose to build up these competences. This will result in a further development of these competences to be able to follow the new strategy. These competences will determine the future of the company.

2. Low strategic fit for the future and low level of competences within the company: Janssen Pharmaceutica will choose to divest in those capabilities. In order to recuperate the investments made in these competences or infrastructure Janssen Pharmaceutica will try to valorize these by using them in different business areas or in cooperation with partners.

3. High strategic fit and a high level of competences within the company: This will result in a higher investment by Janssen Pharmaceutica to strengthen these competences or resources within the company. This will result in a further development of these competences to be able to follow the new strategy. These competences will determine the future of the company.

4. Low strategic fit but a high level of competences within the company: in this case Janssen Pharmaceutica will choose to divest in these competences. Janssen will try to give the infrastructure and competences a new destination within the company.

An example of divesting in infrastructure is the exchange of an analytical device to a partner to obtain new knowledge in the field of analytics. By doing this Janssen Pharmaceutica is able to build a win-win situation. On one hand, the partner was able to get a very expensive machine on the other hand Janssen Pharmaceutica gained important knowledge in the field of analytics.

Because the new strategy of Janssen Pharmaceutica takes care of the patient starting before the disease, new and broader knowledge and technologies have to be obtained. After identifying the business area's in which they needed to invest Janssen Pharmaceutica had to look outside their company and even its sector to attain the necessary knowledge. Building this network and serving as point of contact for the company in Open Innovation is the responsibility of Eric Snoeckx.

As mentioned in section 5.1., Janssen Pharmaceutica changed its whole strategy and this implies that, in order to connect to the needed competences, a strong innovation network has to be built. This results in the connection to known innovation networks and the open entrepreneurial community as well as connecting to different experts in the field of Open Innovation. Moreover, Janssen Pharmaceutica chooses to connect to almost all its stakeholders to build a strong innovation network. In the figure below this broad spectrum of potential partners is presented.

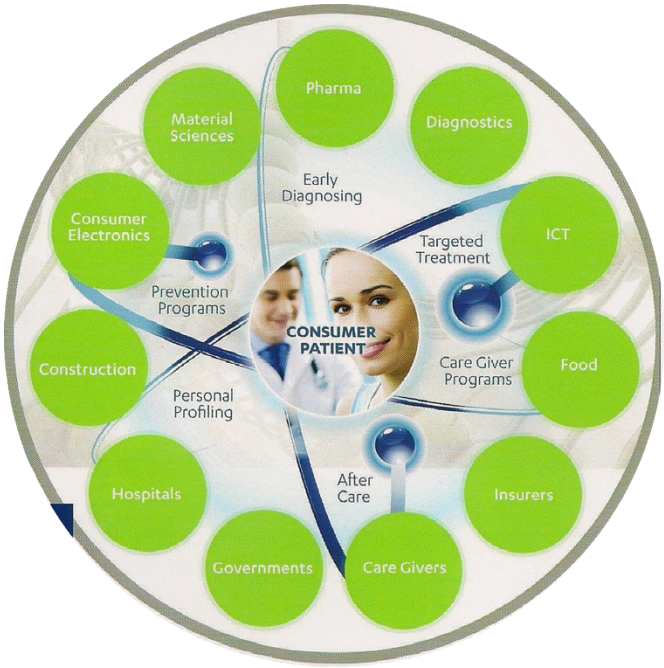

FIGURE 31: OPEN INNOVATION PARTNERS OF JANSSEN PHARMACEUTICA

Source: Open Innovation folder, Janssen Pharmaceutica

In a next phase, Janssen Pharmaceutica will use the results from the gap-analysis to determine how they want to connect to new competences and infrastructure.

In this matrix they examine whether they want to create capabilities and infrastructure outside or inside the company. As we can see on the graph below, the new matrix has the same axes as the first one. On the vertical axes, we examine whether the competences and infrastructure already exists in the company or whether they still have to build them. On the horizontal axes we can see whether the knowledge is present within the company or the knowledge is located outside the company.

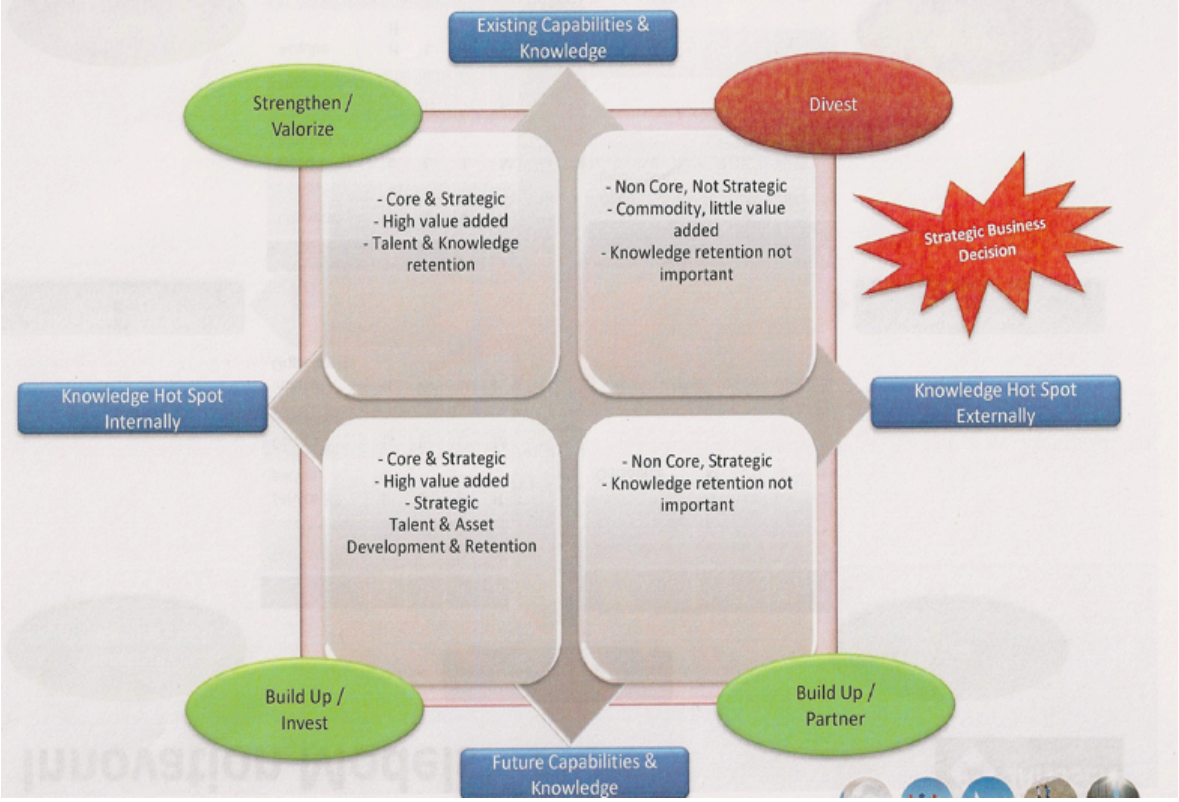

FIGURE 32: COMPETENCES VS. STRATEGY

Source: Open Innovation Center PowerPoint, Janssen Pharmaceutica

In this matrix there are four possible outcomes, presented below:

1. If capabilities and infrastructure already exist and the capabilities are located within the company, we can see that this knowledge is part of the core competences and the strategy of the company. They give high added value and the company will build these competences and the infrastructure internally. This means that they need to retain the talent and knowledge in the company. This results in higher investments to strengthen and valorize the business unit.

2. If we are looking into future capabilities and knowledge that is already present in the company, we can identify a high core and strategic fit. This means that these capabilities and knowledge will offer high added value to the company, this results in the desire to build these competences and the infrastructure internally. This means requires in the first phase the retention and further development of strategic talent and assets. Janssen Pharmaceutica will in this situation chose to invest and build up the business unit.

3. If we look into future capabilities & knowledge that is located outside the company, we can identify that these capabilities and knowledge don't fit the core of the company but have strategic value. This means for Janssen Pharmaceutica that they don't need to retain any knowledge in the company but that a potential partner will have to do this. This will result in a partnership with an outside company, which has these capabilities and infrastructure as a core strategy. An example of such partnership is a partnership with a software company. Because Janssen Pharmaceutica doesn't want to be a software company, they will rely on a software partner to help them.

4. The last quadrant is: existing capabilities & knowledge that are located outside the company. But these don't fit the core competences and don't have any fit in the new strategy. These are regarded as commodities, which won't offer much added value. This means that knowledge retention isn't important for Janssen Pharmaceutica. As a result, the company will divest in this business unit. But as mentioned before, they will try to valorize the competences and infrastructure by giving it another purpose within the company or with partners.

After deciding whether the focus of the competence and infrastructure building is inside or outside the company, Janssen Pharmaceutica will decide which cooperation model they will use. To be able to do this Janssen Pharmaceutica developed a third matrix starting from the matrix in figure 30.

As we can see from the figure below, this matrix has the same axes as the first two matrices. On the horizontal axis of this matrix is presented whether the knowledge is internally present or externally. On the vertical axis, the matrix presents whether the knowledge and capabilities already existing or need to be developed for the future. In figure 33, the Innovation models matrix is shown.

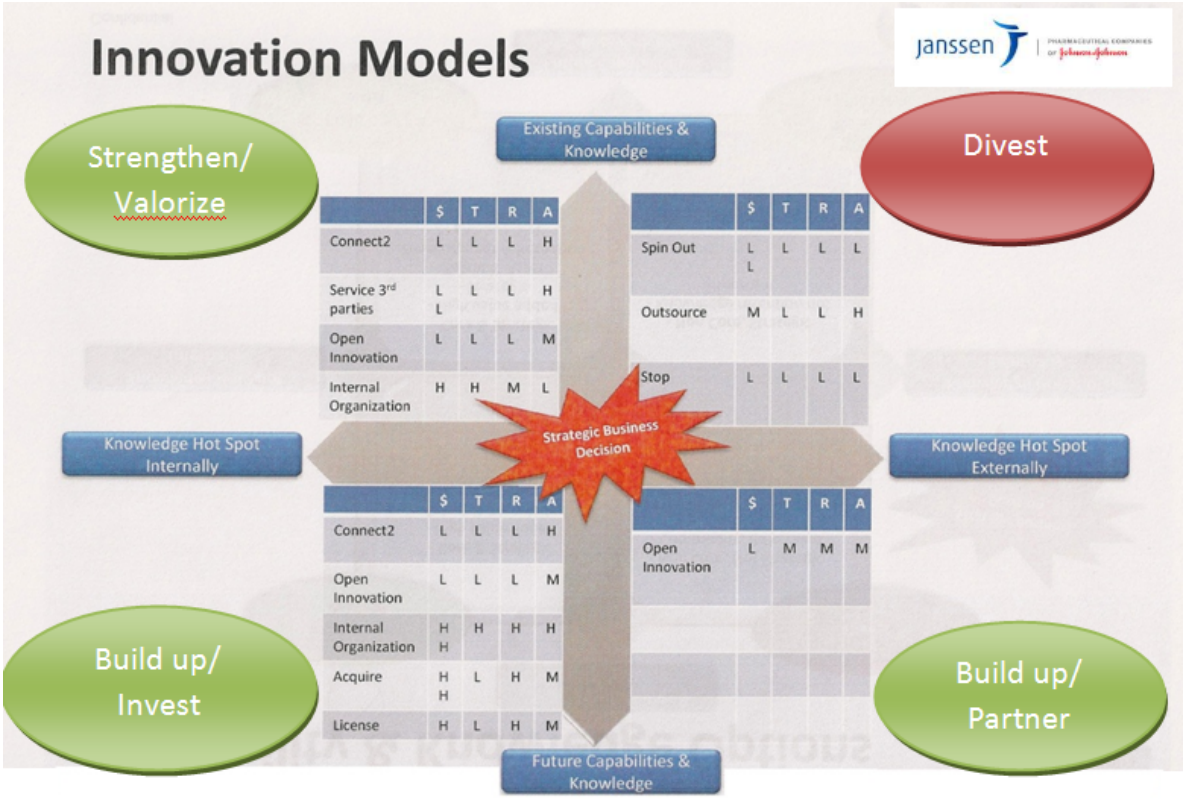

FIGURE 33: INNOVATION MODELS OF THE JANSSEN CAMPUS OFFICE

Source: Open Innovation Center PowerPoint, Janssen Pharmaceutica

First we will look to the upper left quadrant. This quadrant means that Janssen Pharmaceutica already decided that they want to strengthen these competences and infrastructure within the company. With this knowledge they will examine (1) if there is money available for the development of these competences and infrastructure, (2) whether there is a lot of time or not, (3) whether there is high a risk in developing new competences and infrastructure and (4) if there is a reluctance of the internal department in connecting to outside partners. This process offers four different cooperation models to the company:

1. Connect to partners: this option will be chosen if there is a not a lot of money in the company, not much time and there is no or not much risk involved. This collaboration model is characterized by a reluctance to connect to an outside partner.

2. Service third parties: this option is characterized by a very low cost, not much time and a low risk. But there is no interest of the business unit to partner up with other companies.

3. Open Innovation: this will be chosen if there is a low cost, not much time and a low risk. There is a medium capacity of the business unit to connect with an outside company.

4. Internal Organization: this option will be preferred if there is a lot of money in the company, if there is a lot of time, a medium risk and the company is willing to connect to an outside partner.

Secondly, we will look at the quadrant down and on the left. This means that Janssen Pharmaceutica, by using matrix two, decided to invest in new competences and infrastructure to build up a new area of expertise. With this knowledge they will examine (1) if there is money available for the development of these competences and infrastructure, (2) whether there is a lot of time or not, (3) whether there is high risk in developing new competences and infrastructure and (4) if there is a reluctance of the internal department in connecting to outside partners. This process offers Janssen Pharmaceutica with five options:

1. Connect to partners: this option will be chosen if there is a not a lot of money in the company, not much time and there is no or not much risk involved. This collaboration model is characterized by a reluctance to connect to outside partners.

2. Open Innovation: this will be chosen if there is a low cost, not much time and a low risk. There is a medium capacity of the business unit to connect with an outside company.

3. Internal Organization: this option will be preferred if there is a lot of money in the company, if there is a lot of time, a medium risk and the company is willing to connect to an outside partner.

4. Acquire: Janssen Pharmaceutica will choose this option if there is a lot of money available in the company but there is not a lot of time to develop the competences or infrastructure and there is a lot of risk with a medium capacity to connect to partners.

5. License: this option is preferred if there is enough money in the company but not much time, a high risk and there is a medium desire to connect to outside partners.

Next, we will have a look at the quadrant down on the right. This quadrant means that the needed competences and infrastructure isn't part of the core strategy of Janssen Pharmaceutica but has a strategic value for the company. As mentioned before, this can be the need for software to offer new products to customers. With this knowledge they will examine (1) if there is money available for the development of these competences and infrastructure, (2) whether there is a lot of time or not, (3) whether there is high risk in developing new competences and infrastructure and (4) if there is a reluctance of the internal department in connecting to outside partners. Because it isn't part of the core of Janssen Pharmaceutica, this offers only one option:

1. Open Innovation: this will be chosen if there is a low cost, not much time and a low risk. There is a medium capacity of the business unit to connect with an outside company.

The last quadrant is the upper right quadrant. In this quadrant Janssen Pharmaceutica already decided by using the second matrix that it wants to divest in these competences and infrastructure. This offers three options to the company:

1. Spin out: this option will be preferred when there is no money in the company, not much time to divest in these competences and infrastructure, no risk but with a possibility to connect with other partners.

2. Outsource: Janssen Pharmaceutica will prefer this if there is some money available in the company but no time and no risk. Moreover, there is no willingness to cooperate with outside partners.

3. Stop: this last option will be chosen if there is no money available in the company, there is not much time, no risk but still the willingness to cooperate with outside partners.

If the Janssen Campus Office has decided how they want to build up new competences and infrastructure, they will now look into the innovation network for partners that can help them in this process. If they find partners, they will use the chosen cooperation

model to connect to an outside partner. But two special situations namely divesting and Open Innovation need a different process.

5.3.2.Venture & Incubation Center

First of all, if Janssen Pharmaceutica decides to divest in competences or infrastructure a exit strategy needs to be financed. Secondly, if Janssen Pharmaceutica decides to connect to an outside partner by using Open Innovation they need to fund this cooperation. To tackle these two situations, the Janssen Campus office decided to establish a Venture & Incubation Center (VIC). This means that the Venture & Incubation Center is responsible for investing in new companies, possibly start-ups, to connect to new competences and knowledge. Secondly they need to make money available to fund the exit strategy of existing competences and infrastructure.

A second task of the Venture & Incubation Center is using a business incubator & Venture Accelerator for exploration and stimulation of promising internal and external opportunities with a potential to generate new business opportunities in sustainable future healthcare solutions. After a new idea has been found in another company or when an employee has an innovative idea that fits the corporate strategy, the Venture & Incubation Center is responsible for the exploration of this opportunity. As shown in the figure below, there are three phases involved in this process.

FIGURE 34: VENTURE & INCUBATION CENTER (VIC)

Source: Open Innovation Folder, Janssen Pharmaceutica

In order to be successful in these three phases, the Venture & Incubation Center (VIC) offers six services to its partners. First of all, VIC is responsible for the training and coaching of idea champions in developing the critical venture dimensions. Secondly, they will connect the partner to the required competences for faster implementation. After that, it will incubate the business opportunity in a protected environment. A fourth service is the acceleration of the business venture for a rapid market growth. And as a last service, VIC guides the entrepreneurial team in exit phase after incubation or acceleration.

The approach of the Venture & Incubation Center is shown in figure 35.

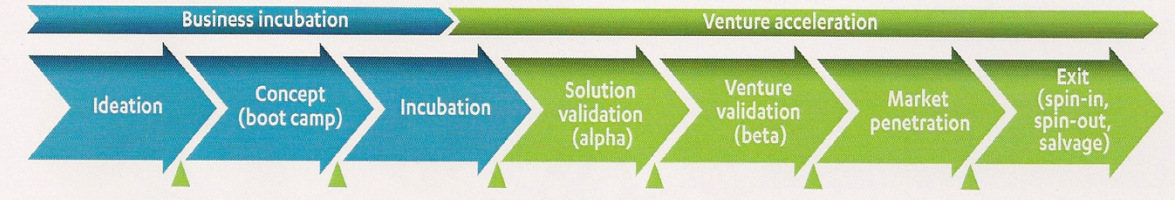

FIGURE 35: APPROACH OF VENTURE & INCUBATION CENTER

Source: Venture & Incubation Center folder, Janssen Pharmaceutica

As shown in the figure above, the process starts with a lot of ideas. After the first phase this idea will be transformed into a concept. This concept will be used in an entrepreneurial boot camp, as represented in the figure 36 below. In this entrepreneurial boot camp the new idea will be pitched to the VIC jury and they will decide if there is potential for further development. If the jury approves the idea, a boot camp team will be composed to consider all required competences. In the fourth step the idea will be developed into a solid business opportunity. To create a solid business opportunity the boot camp team has to think about potential value creation, value capture and value delivery. At the end of this phase the boot camp team has to deliver a compelling value creating business opportunity plan that can convince investors to allocate resources. After this phase, the team will present the business opportunity to top management of Johnson & Johnson. In this phase they will get feedback, a go or no-go decision and an executive sponsor in case of approval.

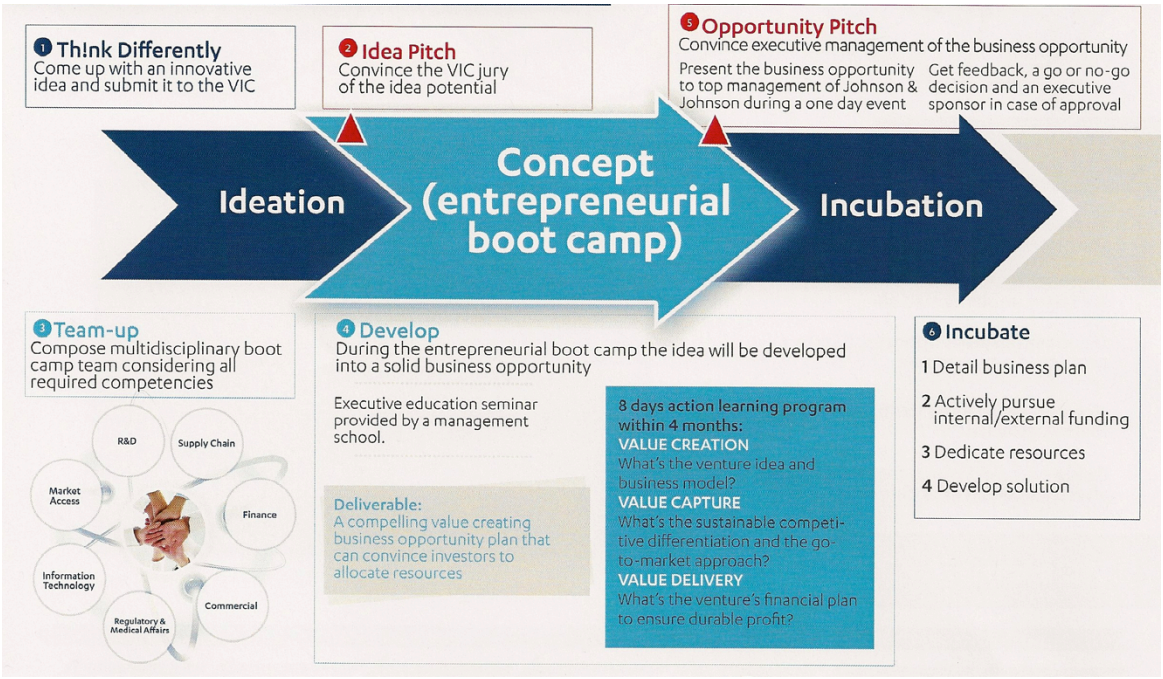

FIGURE 36: ENTREPRENEURIAL BOOT CAMP

Source: Entrepreneurial booth camp folder, Janssen Pharmaceutica

If the concept is chosen is to be developed further, the concept will go into the incubation phase. In this phase a detailed business plan will be created and internal as well as external funding will be pursued. In this phase resources will also be dedicated to the concept and a solution will be developed. After this phase the venture acceleration starts. This means that, in a first step, the developed solution has to be validated. Afterwards the venture formed between Janssen Pharmaceutica and the outside partner has to be validated. If these two steps are completed successfully, first steps will be made to penetrate the market. If the product or service is introduced to the market, we move on to the last phase. In the exit-phase Janssen Pharmaceutica will look into the possibilities for the corporate strategy. They will have to make the decision if they want to spin-in the venture, to spin-out the venture or to salvage the resources and competences that were used by this venture.

5.4. Conclusion

To conclude this chapter we can say that we have the same management support as in DSM. In Janssen Pharmaceutica as in DSM the top-management initiated the strategy change. But the difference is that in Janssen Pharmaceutica the management of the

business groups will chose in which technology to invest instead of using a Corporate Strategy Dialogue. After deciding in which technology or disease the business groups wants to invest, the Janssen Campus Office will perform a gap-analysis. Afterwards, the Janssen Campus Office will start exploring its innovation network to connect to the right partners.

Secondly, it is clear that Open Innovation in Corporate Renewal isn't that different from Open Innovation in the running businesses within Janssen Pharmaceutica. Both are done in the running businesses and both are managed by the same management team. This means that Janssen Pharmaceutica didn't create an Innovation Center to develop new business areas. The only difference between innovation in the running business and innovation in the new business areas is that in the running businesses the management is looking into known partners and research centers. For new business areas, the running business will contact the Janssen Campus Office for building an innovation network to attain the needed competences and infrastructures. The downside of this approach is the fact that new business areas are developed within the same structure as the running businesses. Because of this the new business areas will have the same financial treatment as the running businesses and new business areas will be developed as fast as new products within the running businesses.

Thirdly, we can see that Open Innovation plays a vital part in the new strategy of Janssen Pharmaceutica. Because the new strategy is much broader (from Product Centric to Integrated Customer Centric Therapeutic Solutions), Janssen Pharmaceutica needs to connect to a lot of new partners. Because of Open Innovation, Janssen Pharmaceutica is able to connect to the right partners. An example of the processes of Open Innovation is the connection between Janssen Pharmaceutica and the University of Sheffield. Because both were able to create a win-win situation, they decided to work together in the field of analytics on proteins.

Chapter 6: The use of Open Innovation in Corporate Renewal

In this chapter I will discuss the use of Open Innovation in Corporate Renewal. I will do this by using the two case studies done at DSM and Janssen Pharmaceutica. In the first part of this chapter I will examine if Open Innovation can be used in Corporate Renewal. In the second part of this chapter I will compare the case study of DSM with the case study of Janssen Pharmaceutica. Thanks to this comparison I can highlight the similarities and differences between those two companies. Afterwards, I will discuss some changes that need to be made in the Open Innovation Process that I identified during my research. . In the fourth section, I will create a framework of best practices by using the case studies in chapter four and five. In this framework, I will first start with the strategy processes that should start the use of Open Innovation in Corporate Renewal. Afterwards, I will explain the need of an Innovation Center to enhance the development of Emerging Business Areas or Areas of Interest. In the third section I will construct a new innovation funnel, followed by explaining the difference in partners between Open Innovation in running businesses and Open Innovation in Corporate Renewal. In the fifth section I will go into detail in the business model that should be used by the Innovation Center. After this, I will look into the management team that should be used to manage Emerging Business Areas or Areas of Interest. To end this chapter I will try to construct a new organization of Intellectual Property management to enhances the cooperation with partners.

6.1. Can Open Innovation be used in Corporate Renewal?

Before exploring how we can use Open Innovation in Corporate Renewal, I will first solve the question if it is possible to use Open Innovation in Corporate Renewal. To solve this question I will use the case studies of DSM and Janssen Pharmaceutica.

If we look into the goal of the DSM Innovation Center and the Janssen Campus Office, we can see that both are trying to implement the new strategy of the company. They want to build the necessary competences and infrastructure to be able to create a new business group, business unit or products for the company. To decide whether Open Innovation is suitable to be used for Corporate Renewal we have to look into the processes of Open Innovation.

First of all, Open Innovation is an example to show that firms should not only use internal ideas or technologies but also external ideas or technologies and paths to markets. By doing this, companies would be able to advance their technology and products (Chesbrough, 2003). An example is given by DSM with the Emerging Business Area Bio-Medical. Because the management was looking to complement their internal knowledge with outside specialism, they used the Open Innovation processes to connect to partners. DSM acquired the Polymer Technology Group, they had venture participations in Harland Medical Systems, Xylos etc. and they had research alliances & participations with known research centers. Because of these partnerships they were able to develop the Emerging Business Area Bio-Medical. If we compare this with Closed Innovation where a company only can use its internal R&D center, we can see that it's better to use Open Innovation in Corporate Renewal.

Secondly, we can say that by using Open Innovation a company is able to shorten the time to go to the market. Because a company can rely on partners that already possesss the needed competences and infrastructure, the development of an Emerging Business Area will be much faster.

Thirdly, by using partners a company is able to combine the experiences that will enhance the chance of success and thus reduce the risk of failure. Moreover, we can say that by using Open Innovation a company will be able to manage uncertainties and will be able to spread the cost of innovation. If we look into the case study of DSM, we can see that DSM participates in Investment Funds to spread the cost of investment. Examples of such participations are NGEN, Emerald, etc.

So, we can conclude from both case studies that Open Innovation is the innovation model to use if companies want to build new competences in an Emerging Business Area. But it is important to notice that there is a clear distinction between Open Innovation in running businesses and Open Innovation in an Emerging Business Area. I will discus these differences in section 6.2. (Changes in Open Innovation)

6.2. Changes in Open Innovation

During my research and by conducting the two case studies, I examined the processes used in the classic innovation model and the processes that are used in innovating in Emerging Business Areas. By doing this I was able to detect some changes in the Open Innovation model that enhance the use of this model in Corporate Renewal.

The first difference I discovered is the importance of a network in Corporate Renewal. Because Corporate Renewal changes the strategy and future direction of the company, it is impossible for a company to possesss the needed skills, competences and infrastructure needed for the new strategy. After performing a gap analysis companies will determine which competences need to be obtained. In order to do this a company will look into his network to connect to an outside partner. In running businesses these partnerships are focused on further development of existing competences. But in Corporate Renewal, building partnerships means connecting to partners to develop new technologies or competences that aren't present within the company. This results in a higher importance of Open Innovation in Corporate Renewal.

A second change is the cooperation with other and more distant partners then in running businesses. This means that a company will have to look not only in the value chain or in their known technology partners but that they have to look to a broader spectrum of partners. A perfect example of connecting to different partners is given in the case study of Janssen Pharmaceutica. In the former strategy Janssen Pharmaceutica connected to other pharmaceutical companies or companies that had expertise in the field of developing medicines or researching diseases. In the new strategy, Janssen Pharmaceutica is looking to a broader spectrum of partners that include government institutions, construction companies etc. So, we can conclude that in this new model it is more important to look for partners outside the value chain of the company.

Another change is the scope of partners. If we look into the funnel of innovation, we can see that Open Innovation for running businesses requires businesses partnerships in the middle and the end of the funnel. This results in connecting to partners that are more focused on applied development, the manufacturing and commercialization of products. In Corporate Renewal we start from little or no competences and infrastructure, which means that a company will have to connect to partners earlier in the funnel.

A fourth, and most important change in the Open Innovation model, is the change from a product development innovation to a competence building innovation. In running business innovation, companies already possess the basic knowledge and competences and they are looking for partners to broaden those competences. This is the opposite of innovation in Corporate Renewal. In this case, companies don't know how to develop the product yet, so they have to not only develop a product but most

importantly they have to build the necessarily competences. This results in the fact that the innovation funnel in running business is more focused on developing product, where the innovation funnel in Corporate Renewal is more focused on the learning process of the company. A perfect illustration of this change in the Open Innovation model is the Emerging Business Areas (EBA) of DSM. In these Emerging Business Areas, DSM is following important social and technology trends. Because they do not possess the needed competences, they are looking for partners with which they can connect to obtain this knowledge andtcompetences. It's only after the competences are built and when the Emerging Business Area is transferred to a business group that DSM is looking for partners to develop a product.

A last remark for using Open Innovation in Corporate Renewal is the fact that a company should already practice Open Innovation for a couple of years before using it in Corporate Renewal. Because of the complexity of Open Innovation for a company, it is imperative that a company is already familiar with the processes involved with this model. If Open Innovation proves itself within the company by innovating in a running business group, it will be easier to adapt the process to use Open Innovation in Corporate Renewal. It will also increase acceptance of internal researchers and engineers to develop new competences by using outside partners. Moreover, top management will be more interested in using this model for changing the future of the company.

6.3. Comparison of DSM and Janssen Pharmaceutica

In this section, I am going to compare the two case studies of DSM and Janssen Pharmaceutica. First of all, we will look into the similarities between DSM and Janssen Pharmaceutica in using Open Innovation in Corporate Renewal.

In both DSM and Janssen Pharmaceutica, there is a difference between innovation in the business group and innovation in a new competence area. This results in the fact that the existing business units are responsible for developing new innovative products. In DSM, 80% of innovation is generated within the business units. For Janssen Pharmaceutica, all the efforts in innovation are done within the business groups.

A second similarity is the business model used to define the running business and the development of new competences. For the business model of the running businesses

they both use a Type 4 (Segmented) business model. In this business model, they have some openness towards other companies but both are very defensive in their Intellectual Property management. In developing new competences or new products both DSM and Janssen Pharmaceutica use a Type 6 (Adaptive) business model. This means that both companies open up the boundaries to connect to outside partners. They also enable the innovation model to identify which business model should be used. Intellectual Property isn't managed defensively anymore but is managed as a strategic asset. Because they use a Type 6 business model, both DSM and Janssen Pharmaceutica are able to develop new competences or products in the best possible conditions and collaboration models.

Both companies have the same objective namely being an innovative company by not only looking for new products but also by acting in new segments and new Areas of Interest. We can also see that both companies use Open Innovation to succeed in this task. But the way in which they use Open Innovation differs.

If we look to DSM, we can see that in its effort to practice Open Innovation it created Chemelot. As described in section 4.3.1., Chemelot is an effort to open up the collaboration in the chemical industry by locating them in one place. This enabled DSM to keep its partners nearby and they were able to build a knowledge campus in cooperation with other chemical companies. By doing this, Chemelot can be considered as a campus of expertise. Starting from their campus, DSM will connect to partners within one-day travel.

If we compare this to Janssen Pharmaceutica, we can identify that they choose to collaborate in a different manner. Janssen Pharmaceutica chooses not to locate their partners at the same campus unless it's impossible to do it in other way. The similarity with DSM is that Janssen Pharmaceutica also is looking for partners within one-day travel.

As second difference between DSM and Janssen Pharmaceutica is the management of new competences and infrastructure.
If DSM has discovered new trends, social or technological, they will combine these in innovation pockets. Starting from these innovation pockets, DSM will perform a gap-analysis. Afterwards, they will create an Emerging Business Area (EBA) in which they create a new management team to develop new products. This means that this

Emerging Business Area (EBA) is developed within the DSM Innovation Center by creating a new management team. This results in the fact that DSM gives the Emerging Business Area five to ten years to develop outside the current businesses before handing them over. This gives the management team of the Emerging Business Areas the time to prospect the new technology to develop as much new products as possible. If they think the Emerging Business Area is strong enough to survive in the running businesses then DSM will decide to hand them over. This gives DSM the opportunity to develop as much applications as possible for new technologies but also means that before revenue is generated a lot of investments have to be done. By interviewing Hein Schreuder, Executive Vice President of DSM Corporate Strategy & Acquisition, I was able to detect the tension between the strategy of the Innovation Center and the strategy of the company. In some cases, the Innovation Center keeps developing new technologies but it is DSMs strategy to develop innovative products for the running businesses as soon as possible.
If we look to Janssen Pharmaceutica, the business units will determine which competences they need to build and they will make a request to the Janssen Campus Office to build a new network. If a new network is built and partners are found to attain new competences and infrastructure, the Janssen Campus Office will hand the management over to the management of the business unit. This means that in Janssen Pharmaceutica, the management of the business unit is responsible for the development of new competences and the development of a new infrastructure. Because of their experience Janssen Pharmaceutica is convinced that these management teams are capable of developing new technologies. But in this model, the development of new competences is under the same market pressure as the further development of existing competences.

Another difference between DSM and Janssen Pharmaceutica is the creation of Emerging Business Areas or Areas of Interest.
In DSM, the management has created a Corporate Strategy Dialogue. In these CSD's the management is deciding the future of the company, not only for the running businesses but also for Emerging Business Areas. This means that the board of directors, top- and middle management and an innovation advisory board will determine which technology should be developed further and which hasn't a future within the company. This means that DSM has a top-down and a bottom-up approach. The top-down approach is the change in strategy that is initiated by the top-management. The bottom-up approach is the fact that in the CSD's DSM is using top-management and also middle management to determine the future of the company.

If we look to Janssen Pharmaceutica, we can see that top-management has initiated the strategy change in 2008 but that the running businesses are responsible for choosing technologies that need to be developed. As described in chapter 5, the running businesses review new trends and later on request the Janssen Campus Office to connect to those trends to develop new products. This means that after the new strategy was implemented, Janssen Pharmaceutica has chosen for a bottom-up approach. This results in the fact that the running businesses determine where the company is going to in the future without interference for top-management.

6.4. Using Open Innovation in Corporate Renewal: A new Framework

In this section I will create a new framework based on research and on findings from the case studies at DSM and Janssen Pharmaceutica. First, I will look into the need of a management and strategy process to determine in which trends and technologies a company needs to invest. Secondly, I am going to explain the necessity of an Innovation Center to use Open Innovation in Corporate Renewal. Afterwards, I will create a new funnel of innovation for using Open Innovation in Corporate Renewal. In the fourth section, I will discuss the difference in partners to which a company has to connect in Corporate Renewal. In the fifth section, I will look into the business model that should be used for optimizing the use of Open Innovation. In the last part, I will discuss the use of a new Intellectual Property management.

6.4.1. Managing a new strategy

A first important step in the use of Open Innovation in Corporate Renewal is the existence of a management process of developing Emerging Business Areas or Areas of Interest. This means that a company should transform its organization through innovation of the corporate nature (Guth and Ginsberg, 1990; Dess, 1999) within its environmental context to rejuvenate the organization (Covin et al., 1999). Because of this awareness on the future, a firm can create the important first-mover competitive advantage and imprint the early structure of an industry as identified by Covin et al. (1999). In this process top management should in cooperation with the management of the running businesses and an advisory board determine in which emerging areas or new technologies they are willing to invest.

As described in chapter 3, Prahalad and Hamel (1990) have identified that the management of a company should create a roadmap to identify the core competences that a company needs to build to develop an Emerging Business Area or an Area of Interest. An example of such a strategic process was given by DSM. They developed Corporate Strategy Dialogues in which every five years top management and management of the running business sits together and discusses the trends that are emerging. By developing such a management process the company enhanced the cooperation of every business group in the company and they triggered employees to help determine the future of the company.

In the figure below I have presented such a Corporate Strategy Dialogue. In a first step it is important to know which social and technology trends can be interesting for the company. In every trend there are different technology options that can be used. So the first step is deciding with the top management, the management of the running businesses and experts on innovation which trend and technology should be developed by the company. In thinking about new trends, the Corporate Strategy Dialogue succeeds in answering the question: What kind of company we want to have in the future?

In a next step, the Corporate Strategy Dialogue has to bundle every trend and technology they find interesting for the company. By doing this, the Corporate Strategy Dialogues gets an overview of the different trends that fit the strategy.

In a last step, a company has to decide whether it wants to develop a new technology or not. If a new technology is being developed it should be transformed into an Emerging Business Area or an Area of Interest. Then the company should decide how they are going to develop this Emerging Business Area or Area of Interest into a mature business group or business unit.

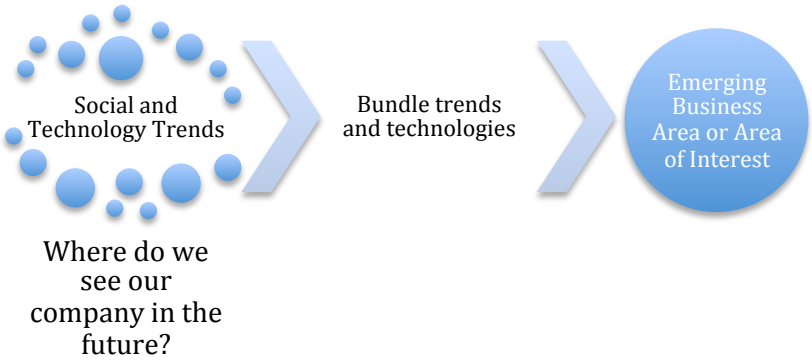

FIGURE 37: CORPORATE STRATEGY DIALOGUE

6.4.2. Creating an Innovation Center

Teece (2007) said that the business success depends as much on organizational innovation, e.g. design of business models as it does on the selection of physical technology. In order to comply with this theory Janssen Pharmaceutica and DSM changed the way in which they innovate in Emerging Business Areas or new business areas. But if we look to the case studies of DSM and Janssen Pharmaceutica, we can see that they use a different approach for using Open Innovation in Corporate Renewal.

As mentioned before, DSM uses an Innovation Center to develop Emerging Business Areas into mature business unit or business groups. This process divides the innovation done in the business groups from the innovation done in the Emerging Business Areas. This is not only done by using the Innovation Center but also by creating a different management team for the development of the Emerging Business Area. Because of this set-up, DSM is able to keep the Emerging Business Areas outside the short-term financial targets of the business groups, allowing them the time to develop an Emerging Business Area into a new business group or unit.

In Janssen Pharmaceutica, the Janssen Campus Office is responsible for creating an innovation network around one Area of Interest. After a network is established the developement of this Area of Interest is transferred to the business group. In this way, the business group is responsible for developing an interesting area into a new product for the company. This results in the fact that both innovations for existing products and innovation in new Areas of Interest are under the same management and are both considered in the financial statements of the business units. This means that the

development of a new Area of Interest probably won't get much time to be developed into a mature business unit or business group.

Because both approaches prove to be successful, it is hard to determine which approach is the best. In my opinion and by conducting this research, it is recommended to create an Innovation Center where Emerging Business Areas or Areas of Interest have the possibility to be developed outside the financial statements. This results in the need of higher investments but it also gives the Innovation Center the time to identify all different applications of one new technology. A second benefit is the fact that a new management team can be used to develop an Emerging Business Area or an Area of Interest. Because innovation in a business group is different than the innovation of an Emerging Business Area, a different management team enables a different approach to develop new competences and products. A last advantage of using an Innovation Center is the possibility to separate innovation in the running businesses and the Emerging Business Areas or Areas of Interest. This would decrease the tension between the exploitation in running businesses and the exploration in the Emerging Business Areas or Areas of Interest as described by Crossan and Berdrow (2003).

There should also be a Venture Capital department, within an Innovation Center. As mentioned in chapter 3, corporate venturing (internal corporate entrepreneurship or external spin-offs) and especially the intrapreneurship can be recognized as a critical approach to renew your company and to keep the long-term competitive in a dynamic environment (Covin et al., 1999; Leonard-Barton, 1992; Elfring and Foss, 1997; Chesbrough and Rosenbloom, 2002). This means that if a new idea for a product is developed internally or externally that the Innovation Center should have the resources to invest in these ideas. In both DSM and Janssen Pharmaceutica a Venture Capital department is present.

6.4.3. A new funnel approach

As mentioned before, there are differences between using Open Innovation in running businesses and Open Innovation in Corporate Renewal. A major difference between these two is the change from product development to competence building. As a consequence, companies will have to use their innovation funnel in a new manner.

In the normal Open Innovation processes we are looking for partners to develop better products or new features of existing products. This means that companies are looking for partners that are situated in their own value chain and partners they have been working with for a long time. This results in the fact that companies are looking for partners that are situated in the middle part of the funnel or near the end of the funnel.

If we want to use Open Innovation in Corporate Renewal we have to change this approach by using a much broader range of partners. In Corporate Renewal we start from little or no competences and infrastructure, which means that a company will have to connect to partners earlier in the funnel. This results in the fact that the funnel needs to be divided into three phases, as in the figure below.

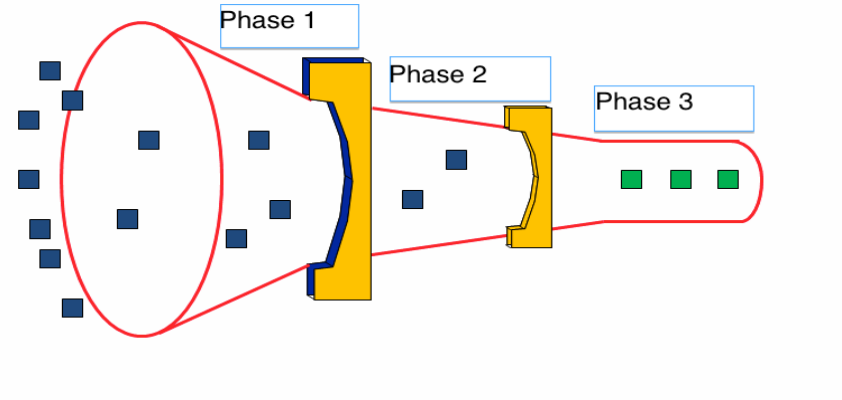

FIGURE 38: OPEN INNOVATION PHASES

Source: picture adapted from: http://www.han.co/blog/wp-content/uploads/2010/04/innovation_funnel.png

In the first phase of the innovation funnel, a company will have to connect to partners that have the needed knowledge. This means connecting to universities, experts in the field or early technology start-ups. In the second phase, the company already build the basic knowledge; this means that they are now looking for a partner that has more experienced knowledge or a company that is able to do the manufacturing of the new product. In the third phase, a company will be looking for partners that can commercialize the new products easily because they are already present in the targeted market.

With this approach a company is able to build the needed competences and infrastructure to build an Emerging Business Area. This can be done like DSM by

buying patents from a university or research center. Another option is to create long-time partnerships with research institutes. With this broad base of competences it will be easier for companies to develop as much new products from a technology as possible.

Afterwards, a company can connect to specific companies to be able to develop the newfound products. A first option is licensing the technology to the partner. A second option enables a company to develop and produce the new product itself by acquiring the partner. This option is recommended when an Emerging Business Area has the potential to be transformed into a new business unit or business group. By acquiring a company doesn't have to rely on a partner to produce a new product.

In the third phase, it can be possible that a partner has to be found who can commercialize the technology. Because Emerging Business Areas are looking for solutions in markets where the company isn't present at the moment, it is beneficial for a company to look for a partner that understands the supply chain of the market. This enables the company to use the knowledge of the partner to commercialize a new product on the market. If a company uses a known company in the market, it will be easier to build a brand name and to get recognized as an innovative company in the new market.

6.4.4. Connecting to different partners

In the innovation model for running businesses, companies normally connect to partners that are situated in their value chain. This means that they are looking for partners of whom they know what competences they possess and what the strengths are of that company. The goal of connecting to these partners is improving current products or the development of products that fit the product scope of the business group. But in Corporate Renewal we ware looking for new competences that can broaden the current core competences of the company. This means that connecting to partners in the value chain won't generate new competences. This results in the fact that companies should broaden their network to use Open Innovation effectively in Corporate Renewal.

This process of developing new competences starts with rethinking the current value chain. Because companies want to develop products that aren't available on the market or for a market that doesn't even exist, they have to change the way they

think about their value chain. In a first phase, a company should determine in which directions it wants to go by developing new products or technologies. Therefore, they have to identify the potential partners that would benefit from a new technology.

An example of these changing partners is given by Janssen Pharmaceutica. In the former strategy Janssen Pharmaceutica connected to research centers that were specialized in research that fitted the business strategy. This meant that they would connect to centers that were specialized in diabetes, AIDS, cancer, etc. But with the new strategy they are looking to help people even before they are declared sick until they are declared healthy. Because of new Areas of Interest, Janssen Pharmaceutica had to broaden their network of partners. This resulted in the fact that Janssen Pharmaceutica is now connecting to new partners like construction companies, ICT-companies, Care Givers, Government institutions, Material Sciences.

But also in DSM we can see that the DSM Innovation Center is looking to different partners then they did before. With their former strategy DSM was looking to partners that were specialized in chemicals. But with the new strategy DSM is connecting to partners like British Petroleum to develop new technologies that would help to develop bio-fuels.

6.4.5. A changing Business Model

As mentioned before, it is important to transform your business model into a more open and adaptive business model for building new competences. The business model used in running businesses that are using Open Innovation is a type 3,4 or 5 business model, as developed by Chesbrough (2006). These business models use innovation in a planned manner with a focus on the external environment of the company. Moreover, we can identify that innovation is connected to the business model. This means that the running business groups are responsible to conduct innovation to improve the existing competences and products. These business models will also look for new technology development but exclusively for technologies that fit the current businesses. Because these business models are focused on innovating the current businesses, we can see that companies are managing Intellectual Property more defensively. Moreover, we can say that companies with these business models are looking to enable Intellectual Property only as a financial asset. The nature of these business models ensures that it’s impossible to use them in this form in Corporate Renewal.

If a company needs to build up new competences or infrastructure it should use open business model to a maximum. This means that a Type 6 business model (adaptive) should be developed. This business model enables the cooperation with outside partners and uses the innovation model to determine which cooperation model should be created. Additionally, it uses Intellectual Property as a strategic asset. A type 6-business model is the evolution for a type 5-business model to open a company's boundaries as much as possible and to enable a different management approach than innovation in the running businesses.

If we look at the case study of DSM and Janssen Pharmaceutica, we can identify that DSM is using a Type 6 business model to enable the building of new competences or infrastructure. This is made clear by the company by using a different management team than in the running businesses and because they are only focusing on developing new technologies and products in Emerging Business Areas. Moreover, DSM created an Innovation Center to separate innovation in the running businesses and in the Emerging Business Areas.

Janssen Pharmaceutica is conducting all its innovation efforts in the existing businesses and they use the same management team as in the running businesses to develop the new business areas. But we can identify a distinction between innovation in the running business and in new business development. In the running businesses, the management is looking to known partners and into specialized research centers. But in the new business areas, we can see that the running businesses are using the Janssen Campus Office to start a new innovation network. The Janssen Campus Office has the task of reaching out to new partners to develop new competences and infrastructures. Because innovation for the running businesses and innovation for new business areas are conducted in the same place we can say that Janssen Pharmaceutica is using a combination of a Type 5 - and a Type 6- business model.

6.4.6. Management of Emerging Business Areas or Areas of Interest

Leifer et al. (2000) have defined four major dimensions of uncertainty that are relevant for all radical innovation development projects: technological, market, organizational, and resource uncertainties. The management challenge of multiple dimensions of uncertainty is complicated by the fact that the uncertainties interact with each other, in the sense that there are complex correlations. Further complexity is

brought by the long time span of the process during which major disruptive changes may happen in technology, markets and competition having major influence (either positive or negative) to the business potential of the innovation. (Paasi, J.,Luoma, T.,Strong, R.,Zhou R. 2008)

Because of this it is important that an Emerging Business Area or an Area of Interest has a management team that has experience with managing uncertainties in the environment. Moreover, the management team should have experience with leading a business unit or business group. Moreover, it is important that a management team has experience with managing uncertainties in the environment. But the management of an Emerging Business Area isn't the same as innovating a business group or business unit. It's never sure that an Emerging Business Area will be a success and will develop new technologies, new business groups or new business units. That is why, in an Emerging Business Area, the management team has to cope with a lot more uncertainty than in the running business. Moreover, this management team has to have a broad background because they are responsible for developing as much products as possible in one Emerging Business Area.

The management team of an Emerging Business Area should thus be composed with experienced managers that know how to develop a new technology and that have prior experience with managing different business groups. This means that only top managers should be given the responsibility to develop an Emerging Business Area or an Area of Interest. This results in the fact that an Emerging Business Area has the needed management to be transformed successfully in a new business group or business unit.

An example of this is given by DSM. In the Emerging Business Areas of DSM, a experienced management team is put together to develop an Emerging Business Area. These management teams have prior experience with managing at least two business groups and have proven themselves before within the company.

6.4.7. New Intellectual Property Management

Chesbrough (2006) identified that the Open Innovation paradigm assumes that there is a bountiful supply of potentially useful ideas outside the firm and that the firm should be an active buyer and seller of Intellectual Property. A company should manage its Intellectual Property not only to leverage its own business but also to profit

from others' use of the company's ideas (Chesbrough,2006). Because a company isn't interested in improving current products or finding new features of current products but is interested in building new technology and competences, we have to change the management of Intellectual Property.

If we look into the cases of DSM and Janssen Pharmaceutica for the running businesses, we can see that they are using a protective Intellectual Property management. Especially Janssen Pharmaceutica is very protective with their knowledge on diseases, viruses and the development of medicines. This is a result of enormous investments in the development of new medicines. Because DSM and Janssen Pharmaceutica are experts in their fields, both companies are able to protect its Intellectual Property vigorously. But in this new framework, a company isn't an expert but is looking for companies who have the knowledge to develop new business opportunities.

In a first phase, a company won't have knowledge or competences so they will not possess any Intellectual Property. This means that a company first has to learn from research done at universities and research centers to build competences and Intellectual Property. Ideally, a company would connect to a university and develop a new technology with their knowledge. If a technology proves to be important for developing new business opportunities, a company will have two options.
The first one is to license the technology exclusive or non-exclusive from the university or the research center. By licensing a technology, a company can force a university or a research center to continue the development of this technology. If a company wants full control over the outcome of the new technology, it will have to license exclusive. If a company wants only the outcomes of the technology that fit their business model, they will license the technology non-exclusive. The benefit of non-exclusive licensing is that other companies can contribute to the development of a new technology, which can benefit the company. Moreover, the fee for licensing a technology will be lower if licensed non-exclusive.
Secondly, a company can chose to acquire the patent of a new technology. By doing this, the company possibly will have to hire some personnel of the university or research center to continue the development of the technology. By acquiring a technology, a company will have the opportunity to license a new technology to partners. This will result in revenue from developing new products and royalties from licensing new technologies. Moreover, a company that owns a breakthrough technology can license it to companies that don't operate in their markets. This implies

that a company should be even more open towards partners for using Open Innovation in Corporate Renewal.

If we look into the cases of Janssen Pharmaceutica and DSM, it was stressed during the interviews that managing Intellectual Property is different for new competences than Intellectual Property in existing business units. Because of these interviews with the innovation management of DSM and Janssen Pharmaceutica, I created new guidelines for managing Intellectual Property.

First of all, companies that want to use Open Innovation in Corporate Renewal should open up their Intellectual Property management. Especially if companies are looking for partners in the first phase of the innovation funnel, they have to open their Intellectual Property. If a company has built new competences or developed a new technology, it has four options for sharing the Intellectual Property.
The first option is to license the outcomes of the new technology. Because one technology will have many applications, a company will have the possibility to license applications it won't use.
Secondly, a company can share its Intellectual Property in innovation network such as IMEC. By using these innovation networks other companies will have the possibility to develop this technology further.
The third possibility of working together with universities or research centers is given by Janssen Pharmaceutica. They traded a medical device for analytical knowledge about proteins. This means that a company should consider sharing infrastructure with universities in order to obtain the necessary knowledge and competences.
A fourth possibility for working with first phase partners like universities and research center is participating in programs started by the partners. This can be participating in research funding or helping a university by giving infrastructural support. An example of this could be the funding a research study of a technology in bio-fuels. This would give a company a first mover advantage if a new technology develops in something promising. Moreover, helping universities with breakthrough research can give a company the possibility to be the first if a new technology is being developed.

Afterwards, if the necessary knowledge is built and a company is looking for a partner in phase two or three of the innovation funnel, they have the possibility to protect their Intellectual Property as in the running businesses. But in order to develop a new technology even further, companies should consider licensing exclusively to partners. This open collaboration will enhance the development of new products and will also

enhance the cooperation with partners. By doing this a partner will feel more important in contributing in research and development.

Part 4: Conclusion and Recommendation

Chapter 7: Conclusion & Recommendations

7.1. Conclusion

Can we use Open Innovation in Corporate Renewal? With this basic question I started my master thesis. After months of hard work in cooperation with Professor Vanhaverbeke, I was able to answer this question.

First of all, I have to point out that the whole process starts with changing or transforming an existing strategy, by using Corporate or Strategic Renewal. Strategic renewal is defined as the transformation of organizations through innovation of the corporate nature (Guth and Ginsberg, 1990; Dess, 1999) within its environmental context to rejuvenate the organization (Covin et al., 1999). In order to change or transform a strategy a company should create a new strategy process. In my opinion, the Corporate Strategy Dialogue-process as used in DSM is the way to do this. By using such a process, a company can enable top-management and middle management to determine the future of the company. In a Corporate Strategy Dialogue-process, top management, the management of the running businesses and experts on innovation should decide in which trend and technology the company should invest. In thinking about new trends, the Corporate Strategy Dialogue succeeds in answering the question: What kind of company we want to have in the future?

Secondly, I saw during my research that Open Innovation could play an important part in Corporate Renewal. Because Corporate Renewal means reinventing a firm's own business model and more importantly reinventing its own company, we need to have a model that can combine every aspect of Corporate Renewal to make it a success, this model is the Open Innovation model. Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms are looking to expand their set of technologies. Open Innovation external ideas into architectures and systems whose requirements are defined by a business model (Chesbrough, 2003). As the only model, Open Innovation enables a company to build new competences and to learn how to connect and absorb competences from partners. Moreover, Open Innovation does this by open cooperation, which means that companies can connect to as much partners as they want and it gives new technologies the chance to be developed in new products. Additionally, Open Innovation will shorten the time to go to market, it will enhance the

chance of success and thus reduce the risk of failure and it is able to manage uncertainties and to spread the cost of innovation. But Open Innovation is mostly used for innovating running businesses. This means that companies that are using Open Innovation today most of the time possess the core competences for developing their products. This results in the fact that Open Innovation is used for broadening and deepening existing competences. As mentioned in chapter 6, this implies that companies are looking for partners in the middle and back end in the innovation funnel. Since Corporate Renewal is quite different than innovating in running businesses, I developed a different Open Innovation model. The first change in the Open Innovation model is the fact that the new model is more directed towards the front-end of the innovation funnel. Because companies don't possess the necessary competences, it is imperative that companies look for partners that have already developed the basic knowledge of a new technology. This is why companies in Corporate Renewal should focus their partnerships in the front-end of the innovation funnel. If companies can connect to universities, research centers, etc. they not only have the possibility to attain new competences but they also have the possibility to be in the front row when new technologies are being developed. Due to this a company is able to reinvent itself over and over again.

A second change in the innovation model is the use of a different business model. In running businesses, companies tend to have a semi-open business model. With this business model, they are able to develop products and new technologies that fit their current businesses. In this business model, companies are managing their Intellectual Property protectively and more as a financial asset. But if Open Innovation is to be used for connecting to unique competences, companies will have to learn to open up their boundaries even more. This is why in the new concept, companies should use a type 6 (adaptive) business model. This business model enables companies to let the innovation model choose the business model that is optimal for developing new competences and technologies. Additionally, this business model is focused for partnerships to develop new technologies for Emerging Business Areas. As a last point, we can see that this business model enables companies to manage Intellectual Property as a strategic asset that can in turn lead into a competitive advantage.

A third change is the change of Intellectual Property management. In the running businesses, companies do their utmost to protect their Intellectual Property. But if you want to engage in an open cooperation with partners, companies have to learn to share Intellectual Property. First of all, a company should build a thrust relationship

with its partners to enable an information-sharing platform. Especially with universities and research centers, companies should share the knowledge that they possess. Rather than protecting Intellectual Property, companies should use Intellectual Property to use it as an asset for creating expertise in new Areas of Interest. To do this a company has two options.

The first option is to license the technology exclusive or non-exclusive from the university or the research center. If a company wants full control over the outcome of the new technology, it will have to license exclusive. If a company wants only the outcomes of the technology that fit their business model, they will license the technology non-exclusive. The benefit of non-exclusive licensing is that other companies can contribute to the development of a new technology, which can benefit the company.

The second option is that a company can chose to acquire the patent of a new technology. By doing this, the company possibly will have to hire some personnel of the university or research center to continue the development of the technology. By acquiring a technology a company will have the opportunity to license a new technology to partners. This will result in revenue from developing new products and royalties from licensing new technologies. Moreover, a company that owns a breakthrough technology can license it to companies that don't operate in their markets.

To conclude we can say that an Emerging Business Area or an Area of Interest has three possible outcomes.

The first outcome is failure to turn the perceived opportunity into a profitable product or technology. In this case, the company should try to recuperate the investment by transferring build competences to use them in the current businesses.

The second outcome is success of the Emerging Business Area or Area of Interest and the transformation into a business unit or business group. If an Emerging Business Area or an Area of Interest is developed into a mature business unit or business group, a company has to transfer it into the running business model of a company.

The third outcome is a spin-off. This outcome has to be chosen if an Emerging Business Area doesn't fit the corporate strategy but has potential for other companies. By keeping a percentage of ownership in the spin-off a company is able to generate additional revenue and to recuperate the initial investments.

7.2. Recommendations

To end this thesis, I want to give some recommendations for companies that want to use Open Innovation in Corporate Renewal. I am going to start with some general recommendations followed by recommendations that are focused on Open Innovation.

7.2.1. General Recommendations

The first recommendation is that a company has to make sure that innovation in the running businesses is separated from innovation in Emerging Business Areas or Areas of Interest. In my opinion this should be done by creating an Innovation Center that has the responsibility of developing emerging technologies.

A second recommendation is using an experienced management team for developing Emerging Business Areas or Areas of Interest. Because developing new technologies and competences means having a high rate of uncertainty, the management team needs to be able to manage this uncertainty. This can only be done by a management team that has been responsible for managing a business group and that has experience with the processes within the company.

Because developing new competences and technologies requires long-term investments, I recommend of giving these Emerging Business Areas or Areas of Interest a different financial treatment. This means that a company has to tolerate that an Innovation Center won't have a profit in the first years. After five to ten years and with the development of new technologies and new products, the Innovation Center should be regarded as a new entity within the company. From this moment, the Innovation Center should be regarded in the same manner as the running businesses in the financial statements.

A third and last general recommendation is the fact that using Open Innovation in Corporate Renewal requires the support of the whole company. This means that not only top-management but also business group management, business unit management and all employees, should have the possibility to propose their own ideas in the project. This enables the company to go towards one broadly supported direction.

7.2.2. Recommendations on Open Innovation

If a company is already using Open Innovation in their company, they should change their processes to use it in Corporate Renewal. A first recommendation is to create a strong innovation network. Because a company will have to connect to a broader range of new partners, an innovation network will play a vital role in the success of using Open Innovation in Corporate Renewal. An example of this is the Janssen Campus Office (section 5.2). This Office has the responsibility to build innovation networks with new partners. Because of this, Janssen Pharmaceutica is able to build partnerships with a broad range of new partners.

A second recommendation is the change in the innovation funnel. As described in section 6.4.3., in Corporate Renewal we start from little or no competences and infrastructure, which means that a company will have to connect to partners earlier in the funnel. This means that companies will have to connect to universities or research centers to develop new competences or technologies.

The last and most important recommendation is that because of the complexity of using Open Innovation in Corporate Renewal, a company should already excel in using Open Innovation in their current businesses. This will enable the company to understand which processes they need to change in what kind of management team they have to compose to develop an Emerging Business Area or Area of Interest successfully.

By using the general recommendations, the recommendations focused on Open Innovation and the new Open Innovation framework we can be sure that Open Innovation can be used in Corporate Renewal and that it will facilitate future business development of a company.

Part 5: Appendix

Table of Figures

List of Persons Interviewed

Name	Company	Function
Rob Kirschbaum	DSM Innovation Center	Vice President Open Innovation
Jos Put	DSM CTO Office	Chief Technology Officer DSM
Hein Schreuder	DSM Corporate Strategy & Acquisition	Executive Vice President
Eric Snoeckx	Janssen Campus Office	Director Janssen Campus Office
Tom Aelbrecht	Janssen Campus Office	Director Venture & Incubation Center

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