

## MASTER

### Open innovation the next step in innovative B2B project work

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Eindhoven, February 2017

***Open Innovation the next step in  
innovative B2B project work.***

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**Master of Science  
In Innovation Management**

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## Abstract

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Several researchers have accomplished a great deal to better understand open innovation activities and its consequences. Most studies report a positive influence of open innovation activities on innovation performances, though only in the specific Business-to-Consumer (B2C) environment. This has resulted in a call for research with the aim of enlarging the innovation performances in a Business-to-Business (B2B) project environment. This study therefore addresses the question: How can companies in a B2B project environment gain the most value of open innovation activities and improve the innovation performances? In addition, due to specific circumstances is it important to research if the moderators: open innovation experience, entrepreneurial orientation, market orientation, resources orientation, and diffusion of technological knowledge are beneficial for the innovation performances.

A self-developed questionnaire and semi-structured interviews are used to provide deliberate information to use in this research study. This information is statistically analyzed and this resulted in significant support of the hypothesis that open innovation activities have a positive influence on innovation performances in a B2B project context. In addition, stakeholders with an entrepreneurial orientation, which is associated with proactive and market push processes, seems to create a fertile setting for open innovation activities. Finally, future research should focus on the possible different impact of outbound and inbound open innovation activities on innovation performances.

## Acknowledgements

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This report is the result of my master thesis project at the University of Technology Eindhoven. The project is executed for the department of Industrial Engineering & Innovation Sciences, more specifically the ITEM group. I have conducted this research at Engie Services in Oisterwijk. The successful completion of this master thesis project leads to the Master of Science degree in Innovation Management. During the master thesis, I have had support from various people, and therefore I would like to thank all these persons.

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I hope that all readers will enjoy, or at least a little bit, this master thesis report.

Koen van Dael

Eindhoven, February 2017

## Executive Summary

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### ***Research background and the main research question***

In particular is it in nowadays industries very important to constantly innovate products and services. For this reason, innovating is critical to sustaining business competitiveness and improving productivity (Brooks, 2013). However, for organizations who mostly work in a B2B project environment, like Engie Services where this research is conducted, is it difficult to innovate because there is almost no released budget assigned to Research and Development (R&D) activities. For Engie Services and other organizations could open innovation be an opportunity because this strategy does not completely depend on own R&D activities. Open innovation is the opposite of closed innovation, which rely completely on internal sources in order to develop new product and services. In contrast open innovation is: *“systematically encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels”* (West & Gallagher, 2006, p. 1). Recent literature (e.g. Dahlander & Gann, 2010; Nordlund et al., 2011) shows that companies, which are focusing on open innovation in some circumstances will improve their innovation performances. Thereby is it an important and interesting research subject to test the influence of open innovation activities in a B2B project environment on the innovation performances, with many limitations to change the organization (Kärkkäinen, et al., 2011). Besides, a significant literature gap is found about open innovation within B2B markets, and thereby is there no clear evidence for the positive influence of open innovation activities on innovations and performances (Kärkkäinen, et al., 2011). This resulted in the following research question: ***How can companies in a B2B project environment gain the most value of open innovation activities and improve the innovation performances?*** In order to make the research more clear a series of sub-questions is used a guideline.

### ***Open innovation principles and hypotheses***

The literature review demonstrates the importance of open innovation for companies in a B2B project environment. Open innovation is a broad concept that has a wide variety of forms (Huizingh, 2011). First of all is it important is that open innovation will be included in companies their business model (Chesbrough et al., 2006). When an organization has changed their business model to an open business model is it important to apply the open innovation processes and the corresponding forms of open innovation. Open innovation can focus in both contexts (B2C and B2B) on inbound and outbound versus pecuniary and non-pecuniary principles (Dahlander & Gann, 2010). Examples

of open innovation modes are: IP in-licensing (inbound, pecuniary), crowdsourcing (inbound, non-pecuniary), spin-offs (outbound, pecuniary), and joint-venture activities (outbound, non-pecuniary). All these modes of open innovation activities could influence the innovation performances. The indicators of innovation performances are: product/service innovativeness, new product/service success, customer service quality, and financial performance. In addition, according to companies in the B2B project environment, like Engie Services, there are some important additional factors that might moderate the direct relation between open innovation activities and innovation performances. These moderators are: open innovation experience, diffusion of technological knowledge and the strategic orientations; entrepreneurial orientation, market orientation and resources orientation. The complete literature review and hypothesis generating interviews with professionals provide the conceptual model in figure 1. The hypotheses suggest that the direct variable and the moderators have a positive influence on the innovation performances.

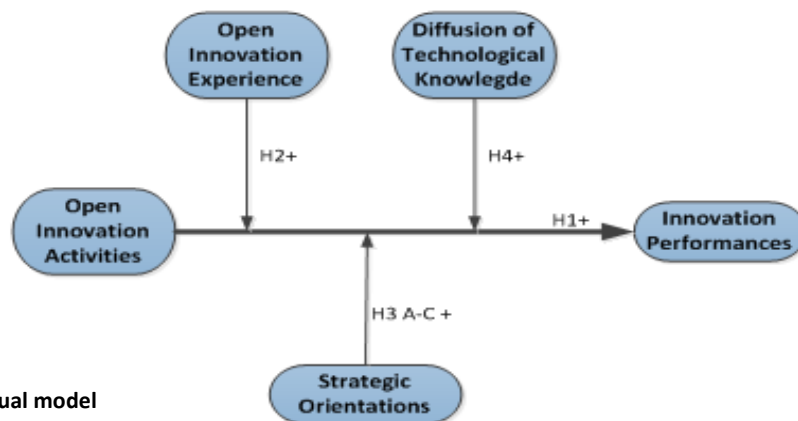


Figure 1: Conceptual model

### **Research methodology and Data analysis**

This research is executed in cooperation with Engie Services, a technical service provider and mostly active in a B2B project environment. The main research strategy that is chosen for this thesis project, and usually is associated with the deductive approach and explanatory research, is the survey (questionnaire) strategy (Saunders, et al., 2007). The questions are sampled in predetermined latent construct, which are defined by the use of scientific literature. This mostly self-developed questionnaire might be underpinned by qualitative interviews with professionals in the B2B project environment. The respondents of the questionnaire are business customers of Engie Services, these persons e.g. directors, project leaders and engineers, could give an objective assessment of the questions in the questionnaire. The respondents of the semi-structured interviews are professionals of Engie Services. The questionnaire is completely filled in by 56 respondents and 12 interviews have taken place. The Exploratory Factor Analysis (EFA) is used for dimension reduction of the

quantitative data. In addition, the Cronbach's alpha test is applied to test the reliability of the measurement, and the validity is checked by randomly split the data sample into two parts. After this, a multiple regression analysis is conducted for six different models. This test checks if the hypothesis of the conceptual model are significant and could be accepted. The models that are tested by the multiple regression analysis are controlled on the constant variance term to ensure that the models are homoscedastic. The results are external valid to other organizations, which work in a B2B project environment.

### ***The results of this research, conceptual management tool, and discussion***

After conducting the different tests, we can conclude that open innovation activities have a significant positive impact on the innovation performances in a B2B project context. In the same way, we can conclude that an entrepreneurial orientation of stakeholders positively moderates the direct relation between open innovation activities and the innovation performances. The other two strategic orientations namely, market- and resource orientations have no significant impact. In addition, also open innovation experience and diffusion of technological knowledge have no significant impact. The results, the qualitative interviews, and a focus-group meeting are used to develop a conceptual management tool. This tool consists of a main flow diagram and 2x2 matrixes to give general project managers guidelines to manage an open innovation project.

In particular, is intensively conducting all types (inbound, outbound, and coupled) of open innovation activities essential to achieve the greatest innovation performances in a B2B project environment. Moreover, the proactive market push focus, which is part of the entrepreneurial orientation, ensures organizations of having similarities with open innovation activities and provides new information and opportunities for all the stakeholders. In addition, stakeholders with clear expertise in open innovation should guide the collaboration process between the stakeholders. To conclude, project work could be more innovative if there is compliance with the open innovation activities and due to a constant search for new opportunities within the project guidelines. However, only coupled open innovation activities could be proven as a significant positive influence on innovation performances and therefore could be used as scientific information for other research studies. In addition, this study adds previous mentioned information to the scientific literature. In addition, several managerial implications are set out to all companies in the B2B project environment. The most important is that the results of this study support managers to further open up the business models, which is the first step of being successful with open innovation activities. Future research should focus more specific on the different modes of open innovation and investigate which modes delivers the most value.



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# 1. The reasons to explore Open Innovation

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This introduction chapter starts with underlining the importance of Open Innovation (OI). Second, it describes the research background. Third, this chapter presents the research questions of this master thesis. Lastly, it provides the structure of this report.

## 1.1. The importance of Open Innovation

Innovation helps business owners push themselves and their businesses to evolve to the next level (Carmichael, 2014). Furthermore, innovation pushes employees to think harder about how to take their positions even further (Im et al., 2012). In the past, internal Research and Development (R&D) was a valuable strategic asset for innovations, and even a hard barrier for competitors to entry in many new and existing markets (Chesbrough, 2003a; Lichtenthaler & Ernst, 2009; Chaston & Scott, 2012). The complete New Product Development (NPD) process was integrated within the company where innovation was performed with the aid of the closed innovation model (Chesbrough, 2003b). As a result, that companies who innovate with the aid of the closed innovation model are self-sufficient, and therefore they miss a number of opportunities (Chesbrough, 2003b). Moreover, research labs, university research, and governmental collaboration were not considered to be of any benefit to companies their R&D program (Enkel et al., 2009). All these factors of the closed innovation model hinder: the discovery of new opportunities, reaching new markets, attracting Intellectual Property (IP) and the improving of the business model (Chesbrough 2003b; Aldmirall & Casadesus-Masanell, 2010). This resulted in that innovating with only internal sources is nowadays no longer a guarantee of profitable outcomes and it makes the innovation process more expensive and besides more risky (Chesbrough & Appleyard, 2007; Santoro et al., 2016). In contrast open innovation is: *“systematically encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels”* (West & Gallagher, 2006, p. 1). Especially, the open innovation model ensures that companies commercialize their own developed ideas as well innovation from other parties e.g. competitors, consultants, universities, consumers, suppliers and distributors (Helfat & Quinn, 2006). In addition, internal inventions not being used in a firm’s business might be taken outside the company e.g. through licensing, joint ventures, or spin-offs (Chesbrough, 2003a). To conclude open innovation activities could be important for all type of business because it:

- Reduces costs of conducting R&D (Tucci et al., 2016).

- Incorporates business customers early in the development process (Aarikka-Stenroos & Jaakkola, 2012).
- Improves development productivity (Santoro et al., 2016).
- Better market research and customer targeting (Hung & Chiang, 2010).
- Potential for synergism between internal and external innovations (Lichtenthaler & Ernst, 2009b).

The next paragraph explains why this research study about open innovation might have a contribution to scientific research and practical problems.

## **1.2. Research Background**

First of all, the context in which this research is set is crucial to understand its practical relevance and potential significance. The research is executed in cooperation with a company, namely Engie Services within the department of Building Automation South Netherlands (known as Cofely GDF Suez prior to April 2015). However, the research mainly focuses on Engie Services in general. Engie is originally a French multinational electric utility company, and nowadays one of the largest energy companies in the world (Schaefer, 2016). Appendix I shows Engie Services Netherlands their organogram, and the position of the department Building Automation (BA) in this organization. The specific business unit Engie Services BA, is a technical service provider and mostly active in a Business-to-Business (B2B) project environment, like almost all departments of Engie Services. The company tries to give the customers as much value as possible, with customer specific automation concepts. This is necessary, because most customers want specific solutions for their projects (Woodruff, 1997). This BA part of Engie Services deals with all kind of technical services throughout the built environment e.g. highways, bridges, offices, factories and weir barriers. It provides the automation and thereby everything, in e.g. buildings, is geared to each other and can be controlled. Due to this, almost all the work is project-related. In addition, practically all of these projects are triggered by the market pull principles i.e. a potential customer has a problem and ask Engie Services BA if they could solve this problem (Luong, et al., 2008). Through this principle there is no released budget assigned to R&D to e.g. present a new innovative business case to the managing board of Engie Services. In addition, almost all of the labor hours of the employees of Engie Services have to be assigned to specific projects, otherwise there is a shortage on the overall budget. Usually this is not a big issue, although these regulations impede the innovative capacity of the employees (Amabile, 1998). The collaboration between Engie Services and business customers turned out to be the subject where the most challenges to improvements and innovations are located (Gouillart & Deck, 2011). To conclude, due to different aspects Engie Services does not fully exploit their

innovation potential. The purpose of this research study might be to come up with some improvements. An important note; there are limitations to change the existing regulations of Engie Services. It is useless to come up with e.g. the idea to change the organization from a project to a hybrid organization for the reason that this needed radical changes in the corporate statutes. This resulted in real recommendations, which have to fit within the current way of doing business of Engie Services. In particular is Engie Services interested in open innovation activities, however these activities are in the orientation phase and therefore it need more research to achieve real results. It might be beneficial if Engie Services has business partners, which have more experience with open innovation activities. These partners may guide the open innovation activities and could take the lead in the collaboration. Therefore, it is valuable to research if collaboration with experienced partners gain more value for all the stakeholders in the open innovation process. In the same way, Engie Services is curious about which strategic orientation contributes the most to the innovation performances. According to the professionals of Engie Services, 90% off their projects are established by means of the market pull principles. Engie Services wants to know if the associated market orientation provides the best innovation performances, or Engie Services might have to focus and invest on the market push or technology leadership strategies to gain the most value out of the open innovation activities. Finally, within open innovation activities is the sharing of knowledge with e.g. suppliers and business customers always a critical point. Most of the firms, including Engie Services, are afraid of sharing too much IP or specific product knowledge with stakeholders. However, the diffusion of technological knowledge might contribute to the customer-value and finally to the value for the end- users of the products. Engie Services wants to know if high levels of diffusion of technological knowledge and the corresponding small communication gap contribute to the innovation performances. The next paragraphs discuss the usefulness of this research for the science.

Recent literature (e.g. Chesbrough, 2003a; Dahlander & Gann, 2010; Nordlund et al., 2011) shows that companies, which are focusing on open innovation in some circumstances will improve their innovation performances. In addition, due to the limit resources available within many R&D departments, it is necessary to search for external knowledge (Chesbrough, 2003b). Thereby is it an important and interesting research subject to test the influence of open innovation activities in a B2B project environment on the innovation performances, with many limitations to change the organization (Kärkkäinen, et al., 2011). Most of the research on open innovation is done in the Business- to-Customer (B2C) context, which emphasize on mass production instead of customization (Kärkkäinen, 2001; Prahalad & Ramaswamy, 2004a). Besides, a significant gap is found in literature

about open innovation within B2B markets, and thereby is there no clear evidence for the positive influence of open innovation activities on innovations and performances (Kärkkäinen, et al., 2011). Generally, according to Prahalad & Ramaswamy (2004b), have B2C open innovation activities a significant positive influence on the innovation performances. In contrast, there are still many companies, which have an aversion against open innovation and especially co-creation (Eidam, et al., 2014; Chowdhury, et al., 2016). The main reason is the fear of losing relevant IP to competitors and other stakeholders (Eidam, et al., 2014) In addition, according to Chowdhury et al. (2016) some of these companies have the so called Not Invented Here (NIH) syndrome. The goal of this study is to show to companies, which work is mostly project related, and in which these companies could minimally change their way of working, the influence of B2B open innovation activities on their innovation performances.

Generally, as mentioned before there are three factors that need further research in which these factors could have influence on open innovation and subsequently the innovation performances (Hung & Chiang, 2010). In order to collaborate successfully together in the B2B open innovation context there need to be set up successful alliances between stakeholders (Slowinski & Sagal, 2010). The management of these open innovation relationships may be the most complex set of organizational activities carried out on a regular base (Antikainen, et al., 2010). Considering the collaboration, different objectives may be aligned to gain the most value out of the open innovation activities and facilitates the management of open innovation activities (Slowinski & Sagal, 2010). Three important (internal) objectives, which might influence these alliances and gain the most value are; open innovation experience, stakeholders strategic orientations and the diffusion of technological knowledge (Rogers, 2003; Brunswicker & Chesbrough, 2013; Cheng & Huizingh, 2014). According to the study of Brunswicker & Chesbrough (2013), companies with higher levels of open innovation experience gain more value out of the collaboration in comparison with less experienced competitors. This information contributes by choosing the appropriate stakeholders for alliances and is therefore useful to research in this specific B2B project environment. Furthermore, Eidam et al. (2014) and Cheng & Huizingh (2014) emphasize that; the different strategic orientations of the stakeholders have significant impact on the innovation performances. It is this, which might be very useful to know in a B2B open innovation context, which kind of strategic orientation creates the most value for all the stakeholders and increases the innovation performances. Besides, the diffusion of technological knowledge could have a big influence on the possible communication gap between a company and the business customers, which do not have technological knowledge (Ahmad et al., 2014; Olsson and Bosch 2014). This appears from the study of Ahmad et al. (2014),

whereby high levels of diffusion of technological knowledge by the provider to the private customers ensure that these customers choose high quality products and services. Therefore, it is interesting to explore if diffusion of technological knowledge between business partners has a positive influence on the collaboration and subsequent innovation performances. To conclude, all these objectives might contribute by bringing together the appropriate stakeholders to gain the most value out of the open innovation alliances and activities. In addition, in the scientific research is hitherto almost no research done on the impact of these factors on open innovation and the related innovation performances. This research context could provide companies in the B2B environment, new insights in the field of open innovation. This is clearly shown in the research question in the next paragraph.

### **1.3. Research questions**

In the previous section is concluded that companies which are project related in the B2B environment fallen behind in comparison with innovative companies. This is caused by too much internally focus, and not having resources for extensive R&D. There is existing collaboration with suppliers and customers, although this is not structured and there are many opportunities to improve these collaborations. In addition, it is not clear which kind of business stakeholders can create the most value together. Thus, the innovation process is not optimal in the B2B environment and this need to be improved, based on the open innovation principles. This leads to the following research question:

***How can companies in a B2B project environment gain the most value of open innovation activities and improve the innovation performances?***

In order to make the research more clear a series of sub-questions have been formulated:

- Q1.1 *What is the direct influence of open innovation activities on the innovation performances?*
- Q1.2 *What is the influence of open innovation experience on the innovation performances?*
- Q1.3 *Which strategic orientation of the business customers has the most positive influence on the innovation performance?*
- Q1.4 *What is the influence of diffusion of technological knowledge on the innovation performances?*



## 1.4. Report Structure

This master thesis consists out of three phases, the orientation phase, analyses phase and design phase. The orientation phase includes chapter 1, which is this chapter, it introduces and elaborates on the research background and usefulness of this master thesis subject. Besides, also chapter 2, which describes the literature, regard to open innovation, the objectives that influence open innovation and the innovation performances. The analyses phases includes chapter 3, which describes the hypothesis development and the research model. Chapter 4 defines the research methodology and finally chapter 5 describes the analysis of the data. The design phase includes chapter 6, which describes the conceptual management tool and chapter 7 discusses the conclusion, theoretical- , and managerial implications and limitations. Figure 2 gives an overview of these phases.

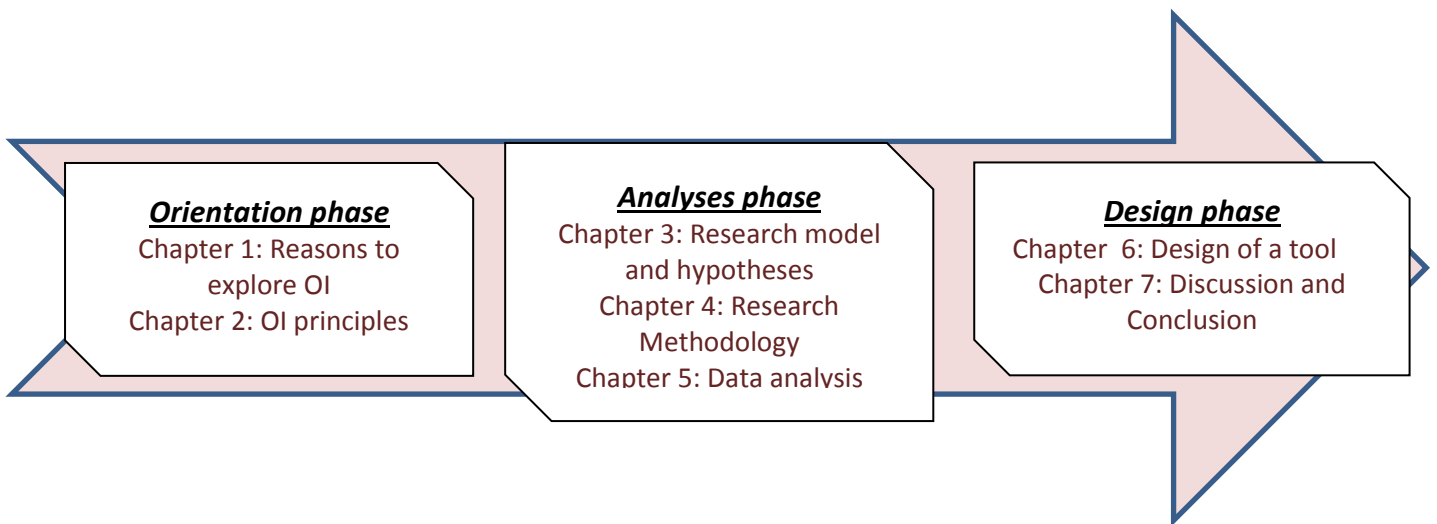


Figure 2: Orientation, analyses and design phases

## 2. Open Innovation principles

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This is a literature review with the focus on open innovation, which is an explicit discussed methodology by the development of new technologies, products, and services. First, the general idea of open innovation is presented. Subsequently, the different modes of open innovation are discussed. In addition, the positive and negative effects of the most common open innovation modes on innovation are described. Furthermore, the most important indicators of innovation performance are explained. Finally, business- and environmental elements that influence the open innovation performance are discussed.

### 2.1. The main idea of open innovation

In the past, about more than 20 years ago, internal Research and Development (R&D) was a valuable strategic asset, even a hard barrier for competitors to entry in many new and existing markets (Chesbrough, 2003a). This research stresses that, nowadays the leading industrial enterprises have been encountering remarkably strong competition from many startups. Surprisingly, these startups conduct almost no basic research on their own, but instead they get new ideas to market through different processes (Enkel, et al., 2009). In particular, the model with the focus on internal R&D is named the closed innovation model (Enkel, et al., 2009). *“In closed innovation, a company generates, develops and commercializes its own ideas”* (Chesbrough, 2003a, p. 36). Moreover, some staff members, of companies with a closed innovation model, have the Not Invented Here (NIH) syndrome, this suggest that more attention to external sources may generate resistance (Laursen & Salter, 2006). In addition, the high technology development costs and shortening of the product life cycle by making use of the closed innovation model, is no longer a guarantee of profitable outcomes and it makes the development more expensive and also more risky (Santoro et al., 2016). Besides, due to the fact that companies with the closed innovation strategy focus too internally, they miss a number of opportunities, which are so called *“false negatives”* (projects that seems to fail but finally turn out to be valuable) (Chesbrough, 2003a). This is because most of the ideas will fall outside organizations their business, or the ideas have to be developed together with different firms to become valuable in the future (Chesbrough, 2003a). Overall, this closed model approach calls for self-reliance i.e. if you want that something is done correctly, you have to do it by yourself (Laursen & Salter, 2006). Table 1 gives an overview of all the closed model principles, most of these principles are somehow described in this paragraph. Furthermore, figure 3 shows the closed innovation model.

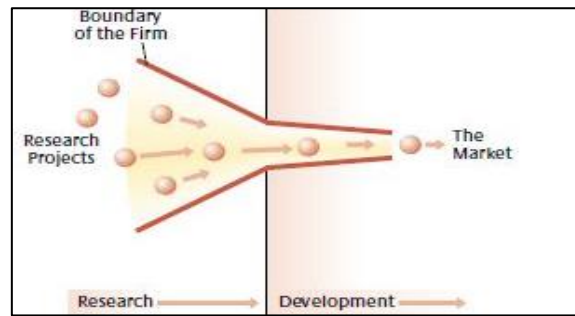


Figure 3: Closed innovation model (Chesbrough, 2003a)

In the new model of open innovation, a company commercializes both, its own developed ideas as well innovation from other parties e.g. firms, consumers, suppliers and distributors (Helfat & Quinn, 2006). *“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”* (Chesbrough, 2003b, p. 11). In addition, according to Helfat & Quinn (2006), firms try to bring its in-house ideas to market by using pathways outside its current business. The boundary between the company and its surrounding environment is porous; this enables innovations to moves more easily between involved parties (Chesbrough, 2003b). However, a better definition of B2B open innovation and used for this literature study is defined by West and Gallagher (2006, p. 1). They specified open innovation as *“systematically encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels”*. Figure 2, shows the open innovation model.

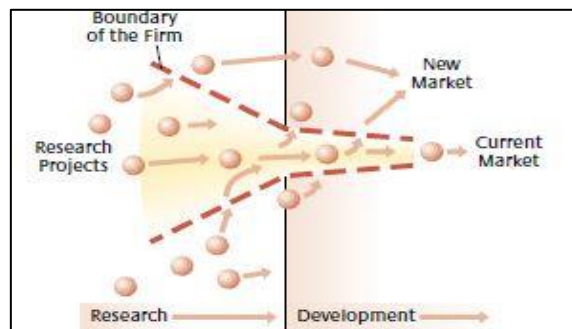


Figure 4: Open innovation model (Chesbrough, 2003a)

Open innovation is a broad concept that has a wide variety of forms (Huizingh, 2011). A clear example of open innovation explained by Kline (2003) is that a company should no longer lock up its Intellectual Property (IP), but instead should find ways to profit from the usage by other firms of their IP. Strategic licensing i.e. sharing core technologies with others, even competitors, and joint ventures are well proved open innovation strategies, which result in significant financial and strategic benefits (Kline, 2003). Moreover, an open innovation business model is the future for an organization to be more efficient and effective this will be explained in the next paragraph.

To conclude, table 1 gives a clear overview of the contrasting principles between open and closed innovation models, which are described in this paragraph. Henceforward, the main focus of this research covers the open innovation principles.

**Table 1: Principles of closed- and open innovation (Chesbrough, 2003a)**

<b>Closed Innovation Principles</b>	<b>Open Innovation Principles</b>
The smartest people in the field work for us.	Not all of the smart people work for our company, so we must find that people and bring their knowledge and expertise into our company (IP in-licensing).
To profit from R&D, we have to do all task by ourselves.	External R&D can create substantial value; Internal R&D is needed to claim some portion of that value.
All the ideas we discover, we will bring to the market first by ourselves.	We do not have to bring all ideas by ourselves to the market to profit of it. (IP out-licensing)
If we are the first to commercialize an innovation, we will be the best.	Improve the whole business model, is better than being the first to the market.
If we innovate and create the most and best ideas in the industry, we will be the best.	Make use of internal and external ideas and we will win.
We should control our IP so that our competitors cannot profit from our ideas.	We should profit from selling some of our IP to others and buy others IP whenever it advances our own business model.

## **2.2. The open innovation business model**

The overall idea is that a firms realization of economic value from their technology depends on the choice of the business model, rather than some inherent characteristic of the technological opportunities itself (Chesbrough et al., 2006). Chesbrough (2006), stresses that these business models are essential for converting ideas and technologies into economic- and customer value. Moreover, open business models enables organizations to be more effective and efficient in creating as well as capturing value (Chesbrough, 2007). It is difficult for a company to start switching their business strategy radically to an open innovation model, but it might have to engage with various types of partners to acquire ideas and resources from the external environment to stay well informed of competition (Laursen & Salter, 2006). Otherwise, it will lose opportunities and it becomes a follower, instead of a leading innovative company (Guiltinan, 1999). *“To get the most out*

*of this new system of innovation, companies must open their business models by actively searching for and exploiting outside ideas and by allowing unused internal technologies to flow to the outside, where other firms can unlock their latent economic potential”* (Chesbrough, 2007, p. 22). Companies have to experiment with their business models to gain the most advantages of open innovation (Chesbrough, 2007). This implies a shift toward inter-organizational relationships and dependencies between companies in a B2B environment (Olsson & Bosch, 2015). According to Davey et al. (2011), the first thing to do is to adjust or rebuilt the business model to handle a significant volume. Subsequently, the business model must obtain “buy in” from key constituencies before being rolled out across the company (Chesbrough, 2007). An important note is that after the development of the business model, the model has continuously to be managed (Davey et al., 2011). There are many different business models; one way to consider the different models is the business model framework (BMF) (Chesbrough, 2006). There are six types of business models, which vary on two dimensions i.e. the depth of investment made to support the business model and, the openness of the model (Chesbrough, 2006). The model helps companies to assess their current business model in relation to its potential (Chesbrough, 2006). Moreover, companies could use the business model to compare it with B2B partners their business model and try to find opportunities for all the stakeholders (Olsson & Bosch, 2015). In addition, Chesbrough (2006) emphasizes, that it helps to define appropriate subsequent steps for the further advancement of that model. However, every person that researches the business model of companies could judge it in a different way (Chesbrough, 2006). Thus, you constantly have to exercise your own judgment.

Chesbrough (2007) stresses, that business models also allow greater value capture by not only use a firm’s key asset, resource or position in their own operations but also in the businesses of other firms. Each firm possess different assets, resources, and market positions and each firm has their unique history (Teece et al., 1997). Because of that, Teece et al. (1997) emphasize that every company looks differently to opportunities e.g. a company will struggle with a concept that requires an unfamiliar configuration of assets, resources, and positions. This resulted in ideas that flow out of places where they do not fit and finally settle in companies that bring them to market; this is a perfect example of how B2B open innovation might create value for companies (Teece et al., 1997; Eidam et al., 2014). The combination of leveraged cost and timesaving with new revenue openings confers powerful benefits for companies willing to open their business models (Chesbrough, 2007). According to Chesbrough (2007), the positive result is that innovations become economically attractive again, even in a technical world with shorter product life cycles. Figure 5 shows the difference in results between closed and open business models. In the next paragraph, the strategies of open innovation will be explained.

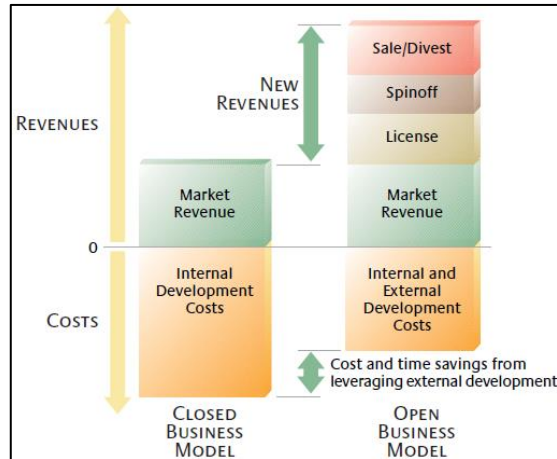


Figure 5: The new revenue model of open innovation (Chesbrough, 2007)

### 2.3. The main strategies of open innovation

There are many strategies for companies to exploiting the principles of open innovation in a B2C as well in a B2B context, the most common areas are: funding, generating or commercializing innovation (Chesbrough, 2003a; Eidam et al., 2014). In particular, is the corporate R&D budget the innovation investor for the company, but nowadays a wide range of other forms have emerged e.g. venture capital (VC) firms, angel investors, corporate VC entities and private equity investors (Chesbrough, 2003a). In contrast, innovation benefactors focus on the early stages of research discovery (Chesbrough, 2003a). Chesbrough (2003b), emphasizes that some companies are offering a portion of their resources to playing the role of benefactor, the purpose of this early-stage funding is to get a first look at the ideas and, through this they can selectively fund those that seems to be favorable for their own industry. The next option is collaborating with generating innovation organizations (Faems, et al., 2010). The article of Chesbrough (2003b) stresses, that these kinds of organizations substitute the corporate R&D laboratories e.g. some R&D parts of huge companies become separate independent business entities with a broad range of expertise. In open innovation this so called innovation explorers can also conduct many research for other companies (Faems, et al., 2010) In addition, there are innovation- merchants, architects and missionaries, which all create advance technologies to serve companies with new innovations (Faems, et al., 2010). Finally, there are two types of organizations those assistances companies with bringing innovations to market: innovation marketers and one-stop centers (Chesbrough, 2003b). According to Chesbrough (2003b), most innovation marketers perform some functions of other types of organizations, although their keen ability is to profitably market ideas. The similarity of innovation one-stop centers and marketers is that they both thrive by selling others' ideas, but they form unshakable connections to the end users (Chesbrough, 2003b). Chesbrough (2003a) stresses that the one-stop centers

increasingly managing a customer his resources to their specifications. These basic principles of open innovation are used for the four open innovation processes in the next paragraph.

#### **2.4. The open innovation processes**

Open innovation can focus in both contexts (B2C and B2B) on inbound and outbound versus pecuniary and non-pecuniary principles (Dahlander & Gann, 2010). Revealing (Outbound Innovation – non-pecuniary) is how internal resources are revealed to the external environment (Dahlander & Gann, 2010). According to Lichtenthaler & Ernst (2009a), this approach deals with how firms reveal their internal resources without directly financial rewards, thus seeking for indirect benefits to the focal firm. The advantage of this open innovation strategy in the previous century was that building on each other's work resulted in a steady stream of incremental innovations across a community of firms (Allen, 1983). The premise is that openness, by voluntarily or unintentionally divulging information to outsiders, does not reduce the chance of being successful (Hippel, 2005; Henkel, 2006). In addition, Henkel (2006) suggests that firms use strategies to selectively reveal some of their innovation or technologies to the public in order to elicit collaboration, although without any contractual guarantees to obtaining it. To conclude, firms with a revealing strategy focusing less on ownership, this increases the opportunities for new innovations, technologies and to gain interest from other parties (Lichtenthaler, 2009). The main disadvantage of this form of open innovation is the difficulty in capturing benefits that accrue (Helfat C., 2006). Besides, competitors can be better positioned with enhanced production facilities and complementary assets to make use of the technological advance (Dahlander & Gann, 2010).

The opposite of revealing is selling (outbound innovation – pecuniary). This type of open innovation refers to how companies commercialize their technologies and innovations through selling or licensing out resources developed in other organizations (Un, et al., 2010). By selling or out-licensing, companies can more fully leverage their investments in R&D, i.e. the most common advantage of this strategy (Hu, et al., 2015). Besides, Dahlander & Gann (2010) suggest, that partnering with actors adept at bringing inventions to the market place. Nowadays it is more common to licensing out inventions, some firms use it as a strategic priority to obtaining financial resources with their IP (Fosfuri, 2006). In contrast, there are many obstacles that prevent companies from selling or licensing-out innovations and technologies (Rivette & Kline, 2000). The most common disadvantage is the significant transaction costs involved in transferring technologies in a B2B environment (Hu, et al. 2015). The negative side effect is that the potential of selling technologies in the market place has still not been fully leveraged, the market for technology could be almost 70% larger if some obstacles will be overcome (Gambardella et al., 2007). In addition, firms have difficulties with

anticipating the potential value of the technologies, they may be over-committed for the reason they already invest many resources (Chesbrough & Rosenbloom, 2002). Chesbrough & Rosenbloom (2002) emphasize, that this could also be an obstacle that prevents firms from out-licensing technologies, thus many firms lack a deliberate strategy.

The opposite of outbound innovation is inbound innovation. The first form is sourcing (inbound innovation – non-pecuniary). This is the most common used method of B2C open innovation i.e. how firms can use external sources for innovations and technologies. According to Chesbrough et al. (2006), firms scan the external environment prior to initiating internal R&D activities, if existing ideas and technologies are available, the firms use them. In most cases, firms that manage to create a synergy between their own processes and externally available concepts may be able to benefit from the ingenious ideas of outsiders to generate profitable new products and services (Dahlander & Gann, 2010). These partners may include suppliers, customers, competitors, consultants, research institutes, universities, or governments (Tether & Tajar, 2008). In addition, Leiponen and Helfat (2010), stress that the parallel-path strategy in innovation, where firms maintain an open strategy of sourcing information together with an ‘open mind’ about the paths to innovation is the most proven implications for success. A potential limitation could be the cultural difference between e.g. Japanese and European firms, it is difficult to harmonize these cultural barriers (Dahlander & Gann, 2010; Cheng & Huizingh, 2014). Another negative effect of sourcing is that firms over-search, there is a curvilinear relationship between innovation performance and their search for new innovations (Katila & Ahuja, 2002; Laursen & Salter 2006). This resulted in that firms come to rely too heavily on external sources of innovation and causing extra searching costs (Rothaermel & Deeds, 2006). Finally, acquiring (inbound innovation – pecuniary) is a form of open innovation. Following Dahlander & Gann (2010), this type of openness refers to searching and acquiring for license-in new input to the innovation process through the market place. Acquiring valuable resources to an innovation process requires much expertise (Dahlander & Gann, 2010). Besides, in order to invest when openness is high, companies need some degree of control over the elements in their networks to make it a successful investment (Zedtwitz & Gassmann, 2002). A disadvantage of acquiring is that in some cases the incorporating knowledge bases too close to what the company already knows (Dahlander & Gann, 2010). This may hamper the positive effect of assimilating external inputs e.g. if knowledge bases are too similar it is difficult to come up with novel combinations (Sapienze et al., 2004). To conclude, the effectiveness of openness is contingent upon the resource endowments of partnering companies and organizations (Dahlander & Gann, 2010). Finally, open innovation and the related business models are changing practice and creating strategic positions that before had not



been clearly articulated (Chesbrough & Appleyard, 2007). Figure 6 gives a clear overview of all different forms of open innovation in every segment.

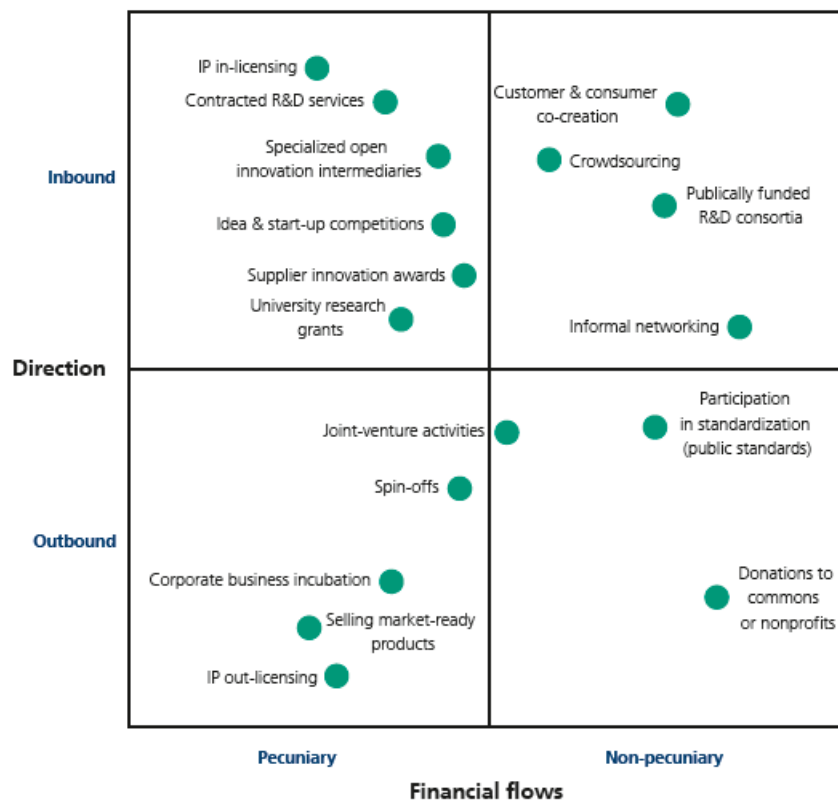


Figure 6: Classification of modes of open innovation (Brunswicker & Chesbrough, 2013)

## 2.5. The most important modes of open innovation

Most of the open innovation literature focuses on B2C inbound processes, whereas outbound processes have received less attention (Mortara & Minshall, 2011). In contrast, one of the most important modes of open innovation with much attention is the firm's IP strategies (Lichtenthaler & Ernst, 2009b). An IP strategy is a strategic use of its technology pool, which is a firm's capacity for innovation output, this is based on in-house R&D or acquired technology from external sources (Motohashi, 2008). This resulted in, that in a world of open innovation, IP licensing becomes an important tool for innovation performances, and it is inbound as well outbound open innovation (Motohashi, 2008).

### 2.5.1. Outbound open innovation

In particular, most of the firms are unable to fully capitalize on their technology internally, and thus the outbound strategy IP out-licensing helps them to capture additional value (Pisano & Teece, 2007). Some pioneering companies have gain significant benefits via IP out-licensing although there are almost no firms that fully focus on out-licensing as core activity of their business (Hu, et al.,

2014). However, many companies are still skeptical about the use of IP out-licensing in the B2B context, while about some of the companies even decided against an open innovation approach (Eidam, et al., 2014). The out-licensing of IP could have two kinds of effect (Motohashi, 2008). As mentioned before, Motohashi (2008) discusses the revenue effect i.e. simply generating licensing revenue from licensees. The other one is the rent dissipation effect, due to the IP out-licensing there arise more competitors in the market this increases, the competition and this resulted in the negative dissipation effect (Motohashi, 2008). However, in a competitive market, where the rent dissipation effect is relatively small, the licensing propensity is relatively high (Arora & Fosfuri, 2000). In particular, there are many factors, which should be taken into account firm's decision on out-licensing or not licensing (Hu et al., 2014). Similarly, spin-offs of companies are also a key mode of outbound open innovation (Dahlander & Gann, 2010). Especially, the unique role of spin-off companies in the economy is heavily discussed in the literature (Lejpras & Stephan, 2011). The study of Lejpras & Stephan (2011) emphasize, that there is a difference in research spin-offs and company spin-offs. One the one-hand research spin-offs are defined as firms originating from e.g. a university of research lab, which have a former member of these institutions as founder (Callan, 2001; Lejpras & Stephan, 2011). On the other hand, company spin-offs are defined as firms created by splitting off from a preexisting company and this could be B2B customers (Callan, 2001). These two types of spin-offs have many different characteristics therefore is it necessary to make a distinction between these two types (Lejpras & Stephan, 2011). The focus of this study will be on company spin-offs, these will receive more support from their parent companies during the production and commercialization phases by e.g. providing supplier and customer information or the availability of already established market segments (Clayton, et al., 1999). This resulted in that spin-offs are more innovative than firms created in other ways, and have better firm performance (Peters, 2006). The literature suggest if there is the possibility of creating spin-offs might consider it, so do not hamper innovative employees by the development of spin-offs, but try to gain advantages of it.

### **2.5.2. Inbound open innovation**

In contrast, two different but one of the most common forms of inbound open innovation are: crowdsourcing and co-creation (Deck & Strom, 2002). In recent years, many companies in different industries have begun to experiment with outsourcing innovation-related tasks e.g. new product ideation, idea evaluation, and prototype testing or user assistance to "crowds" outside the company (Nabisan, 2009; Nabisan & Baron, 2009). Some companies have attributed great potential to outsourcing idea generation to the crowd especially in a B2C context, others are clearly more skeptical about this business strategy (Poetz & Schreier, 2012). The study of Poetz & Scheier (2012)

reveals that crowdsourcing processes generated user ideas that score significantly higher in terms of novelty and customer benefit, in comparison with traditional R&D ideas, but a bit lower on feasibility. The difference between crowdsourcing and co-creation is that users via crowdsourcing generate and evaluate total new ideas to solve their problems (Hippel, 2005). To illustrate, a company recognized a common need for many users and asked customers to come up with as many as possible ideas to solve this problems. Dell, for example, has launched an initiative platform called Idea Storm, where users from all around the world have been invited to suggest product improvements or total new product improvements online (Poetz & Schreier, 2012). This resulted in more than 10,000 ideas suggestions by customers (Poetz & Schreier, 2012).

As I mentioned before, another form of open innovation is co-creation i.e. *“Working across corporate boundaries to co-develop products and customer solutions is steadily becoming the operative model for R&D in a wide range of industries”* (Deck & Strom, 2002, p. 47). Co-creation refers to collaborative activities between different stakeholders in the innovation system and which combine the inbound and outbound activities, this can be applied in a B2C as well in a B2B environment (Gassmann & Enkel, 2004). Most of the companies only collaborate sporadically, driven by a particular need, on project base (Deck & Strom, 2002). According to Deck & Storm (2002), some companies making co-development an integral element of their business model, this resulted in significant gains in the effectiveness and efficiency of the R&D department. The difference with crowdsourcing is that within co-creation all the stakeholders in the value chain collaborate on the creation of value for all stakeholders (Prahalad & Ramaswamy, 2004a). Instead of only the opportunities for customers to come up with innovative ideas, and thereby gain more value with their ideas (Frank, et al., 2006). In most cases, B2C co-creation is the most widely researched topic (Kärkkäinen, et al., 2011). This study stresses that B2C co-creation is a big trend these days, for the reason that customers want products that better meets their needs e.g. Nike, KLM, McDonalds and Nokia have done co-creation projects with customers and other stakeholders in the last ten years. However, investigation into co-creation in the B2B context is an underexposed research topic (Kärkkäinen et al., 2001; Gouillart & Deck, 2011). In open innovation and especially co-creation, there are several aspects to consider when talking about companies in B2B instead of B2C sector (Eidam et al., 2014). The higher complexity of the buying process in the B2B context and besides the reality that the experiences of most of the stakeholders still get short shrift (Kärkkäinen et al., 2001; Ramaswamy & Gouillart, 2010). This resulted in that stakeholders have no significant say in designing final products or services, although that customers and users in the B2B context may have the motivation of getting the precise product they want. (Ramaswamy & Gouillart, 2010; Nordlund

et al., 2011). According to Gouillart & Deck (2011), B2B co-creation can offer significant opportunities to enhance revenues and profits for all the stakeholders and across the entire value chain. In addition, the stakeholders within a B2B co-creation could be: the company, employees, suppliers, distributors, competitors, customers, and all other firms involved in the process (Kärkkäinen, et al., 2011). However, companies in the B2B open innovation context prefer to engage in innovation initiatives with suppliers (Olsson & Bosch, 2015). Due to the fact that suppliers and customers keep most operational processes cordoned off from each other, they will miss chances for innovation and value creation (Gouillart & Deck, 2011). The primary reason of this problem is, according to Gouillart & Deck (2011), that it is very difficult to predict which interactions will offer the biggest opportunities. Ramaswamy & Gouillart (2010) and Eidam et al. 2014, emphasize that there are four basic principles that have to be applied in any kind of business *before* you can setup a successful B2B co-creation:

- The stakeholders will not wholeheartedly participate in B2B co-creation unless it produces value for them, as well. The approach has to establish a large and diverse community of people inside and outside the firm (Gouillart, 2014).
- The best way to co-create value for all the stakeholders is to focus on the experience of all stakeholders.
- The stakeholders must be able to interact directly with one another. In the next paragraph Gouillart and Deck (2011) give some suggestions to achieve this.
- Companies should discuss about platforms, which are necessary to interact and share their experiences (Gouillart, 2014).

The best way is to start small with B2B co-creation, focusing on it with two or three key stakeholders and on a specific purpose e.g. improving the process speed, or improving order fulfillment (Ramaswamy & Gouillart, 2010). In addition, Gouillart and Deck (2011) and Eidam et al. (2014) discuss five real practices to apply for a successful co-creation, to bring B2B co-creation to the next level with all the stakeholders:

- If you want to achieve success with co-creation in a B2B setting, you have to take the first step. This resulted in that you have to take the risk to making one or more of the processes transparent to your business partners. This creates vulnerability, but this is the price you have to pay to initiate co-creation. Moreover, the fact is that B2B customers most of the time reciprocate when approached in this fashion.

- You have to start with co-creation inside the company. Thus, prepare your own employees for a co-creation process. In particular, make sure that they know how to describe their own functional interactions and experiences in a transparent work environment.
- Use a predefined common language and analytical structure. To illustrate, words such as engagement platform and interaction have a specific meaning in a co-creation initiative. In addition, the co-creation business cases need to quantify benefits for all stakeholders involved in the processes.
- Create governance to co-creation. As the firms involved in the processes, progress in co-creation establish a formal governance system for the effort. This governance structure has to straddle the boundaries of the stakeholders that are involved in the B2B co-creation.
- Finally the creation of engagement platforms. As early as possible in the co-creation process, start developing a co-creation idea management platform that allows stakeholders on all sides to start suggesting new ideas and opportunities for co-creation. This platform will allow stakeholders to expand the scope of co-creation effort wider and wider and the involvement of more strategic interactions. In addition, create targeted operational engagement platforms to enable specific working interactions that add value to the processes.

To conclude, Gouillart & Deck (2011) and Eidam et al. (2014) emphasize that B2B co-creation offers all parties willing to engage with each other a new way to win together. This can result in greater productivity and creativity, reduced turnover and lower costs (Ramaswamy & Gouillart, 2010). There are real examples of companies e.g. Orange, the operating brand of France Telekom, that have significant better results due to B2B co-creation (Ramaswamy, 2010). This company has really learned how to manage the process of creating unique value with customers and other stakeholders, and excellent working engagement programs and processes that enables interaction among all different stakeholders everywhere in the system (Ramaswamy, 2010). However, according to Ramaswamy (2010), firms could also focus only on a few business units e.g. co-creating innovation management, co-creating strategy and decision making and co-creating markets and brands. In particular, the most important part of achieving better results with co-creation, is as mentioned before business model innovation this is vital to sustaining open innovation (Chesbrough & Schwartz, 2007). Moreover, Chesbrough & Schwartz (2007) stress that by assessing others' business models, understanding the own business needs, and the degree of their alignment with the own business model, can result into more valuable co-development partnerships. As mentioned before, the goal of B2B co-creation is to gain more value for all the stakeholders, which has mutual benefits,

in all kind of business processes (Ford, 2011). This may be achieved by effectively standardization efforts, share maintenance costs and engage in open innovation initiatives, while at the same time increase control and accelerate development of differentiating functionality (Olsson & Bosch, 2015). Although, a perception of harmonious co-creation of value can be considered as naïve and simplistic and, in particular in a B2B context, does not consider the complexity of interfirm relationships (Lindgreen, et al., 2012). That is why there is also a dark side of B2B co-creation; the dark side of B2B co-creation refers to those aspects of value added activities that are hidden and include potential risks during co-creation (Chowdhury, et al., 2016). Only a few numbers of studies have discussed the negative effects of co-creation (Echeverri & Skalén, 2011; Edvardsson, et al., 2011). However, these studies take a B2C perspective, which is not that interesting for this study (Chowdhury, et al., 2016). Some examples of the negative side effect of B2C co-creation are employees that may face role conflicts which can result in burnout (Edvardsson, et al., 2011) or consumers may engage in opportunistic behavior, like activism against the firm which can negatively affect the firm revenues (Ertimur & Venkatesh, 2010). Thus, a small number of studies that discuss the negative outcomes of co-creation, only focus on B2C settings (Chowdhury, et al., 2016). There is a lack of studies that focus on the negative aspects of B2B co-creation, thus it is a suppositious research topic (Mitrega & Zolkiewski, 2012; Villena et al., 2011). Representation of the perspectives of suppliers, distributors, buyers, and other stakeholders within the business network is needed in order to investigate the dark side of B2B co-creation (Chowdhury, et al., 2016).

Table 2 and 3 give a brief but clear overview of the positive outcomes of B2B value co-creation. These tables are based on the study of Walter et al. (2001), which focus on value creation in B2B relationships. The value outcomes in table 2 are categorized as *direct value outcomes* (positive effects derived within a given relationship and which influences directly on the stakeholders business performance) and *indirect value outcomes* (which capture connected positive effects in the future and/or in the wider business network).

**Table 2: Direct value outcomes of B2B co-creation (Walter et al., 2001)**

<b>Direct Value outcomes</b>	<b>Definition</b>
Financial value	Favorable business performance and profits.
Brand growth	Contribution to the growth of the companies' brands in terms of market performance.
Creative/media/ activation Communications	Clients and suppliers believe that the main outcome of value co-creation is that it leads to creative/media/activation communications with their stakeholders. This is an expertise, which clients do not have.
Consistency in quality	Delivery of a consistent level of quality by the stakeholders
Time efficiency	Reduction in time spend on production and advertising campaigns
Cost efficiency	Reduction in media/activations costs

**Table 3: Indirect value outcomes of B2B co-creation (Walter et al., 2001)**

<b>Indirect value outcomes</b>	<b>Definition</b>
Client/supplier learning	Stakeholders gaining knowledge and expertise from each other regarding to products, marketing research, business models etc.
Enhanced reputation	Improved company image; makes them more attractive as suppliers and clients
Innovation	New ideas, techniques and application of these ideas during the project implementation
Awareness about competitor tactics	Creating awareness about industry trends and providing marketing intelligence about competitors
Access to other network actors	Being put in touch with other actors in the network or gaining access to the resources of other network actors.

On the one hand, B2B co-creation has many positive direct and in-direct outcomes for the stakeholder on the other hand there are also some negative effects of B2B co-creation. These are described in more detail in the next paragraphs and based on the study of Chowdhury et al. (2016).

#### *The effect of role conflicts and ambiguity on value co-creation*

Most of the actors in the co-creation process are found to experience role conflicts, which created tensions during the B2B value co-creation (Tubre & Collins, 2000). Following Tubre & Collins (2000),

role conflicts occur when there is a mismatch between the expected set of behaviors associated with the role. In addition, role ambiguity occurs when the set of behaviors expected for a role is unclear (Tubre & Collins, 2000). These role conflicts and ambiguity may be faced during the interactions between e.g. suppliers and clients and the agencies and third actors. In some cases, managers faced role conflicts relating to meeting internal standards and guidelines e.g. when clients appeared to choose less effective opportunities. This suggests that engaging in B2B co-creation with customers may lead to disappointments and demotivation, where suppliers face conflicts in meeting their own task objectives and at the same time trying to meet the requirements of the customers. Moreover, suppliers try to deliver what the customers want, but their internal R&D team may not be willing to update the product. Thus due to conflicting job demands, the individual is unable to do everything that is expected.

#### *The effect of opportunism on value co-creation*

The role conflicts, which are described before, may appear to lead to opportunistic behavior. This opportunism refers to actions, which involve self-interest seeking with guile (Williamson, 1985). That is why some of the stakeholders in the process overestimate their own competences. This will result, during the co-creation process, in disappointment and recriminations between the stakeholders and needs unwritten relational norms to avoid these problems (Luo, 2006). Finally, these negative processes may cause the premature end of the B2B co-creation.

#### *The effect of exertion of power on value co-creation*

The power of specific people or stakeholders can be defined as the capacity to influence people and events (Yukl, 2006). Usually, it is common that there were power imbalances in the relationship between all the stakeholders. This is recognized by most of the managers and is not necessarily seen as something negative for the B2B co-creation. However, during the co-creation suppliers may be more aware of which activities will benefit the client than the clients themselves. Therefore, the term “power plays” is used to describe the game-like nature of exertion of power during the co-creation, where stakeholders make sophisticated attempts to influence other stakeholders without damaging their relationship. These findings indicate that dark forces such as power plays are often at work behind the scenes during B2B co-creation and that the value creation is not achieved merely through dialogs, sharing of information and collaboration as suggested by (Aarikka-Stenroos & Jaakkola, 2012; Payne, et al., 2008; Ramaswamy & Guillard, 2010). The study of Chowdhury et al. (2016) presents an example given by an employee about the use of power: “A stakeholder has an allergy about evaluation measures, so the stakeholder don’t want that other people criticize their



way of working positively or negatively. The stakeholder mentioned that their way of working is the correct methodological process". Overall, the B2B open innovation can ensure much value for all the stakeholders, but there have to be clear agreements, otherwise the negative effects of B2B open innovation prevail. The next paragraphs describe the factors that could measure the positive or negative influence of B2B open innovation.

## **2.6. Indicators of innovation performances**

There are studies that emphasize the negative or the positive effects of open innovation on innovation performance. In particular refers innovation performance to the degree of success attained by companies in achieving goals related to new products or services (Henard & Szymanski, 2001; Montoya-Weiss & Calantone, 1994). Following the recommendations of Henard & Szymanski (2001), this research study applies multiple performance measures to assess different aspects of innovation performance. There are four important dimensions, which will be discussed more extensively in the next paragraphs of this literature review. The first one is new product/service innovativeness this refers to the level of novelty of the resulting innovations (Salomo, et al., 2008). The second one is new product/services success, this reflects the ability of a new product/service to compete in the marketplace (Baker & Sinkula, 1999). The third one is customer performance, which covers areas such as customer satisfaction and loyalty (Blazevic & Lievens, 2004). Finally, financial performance refers to the overall financial success of an innovation e.g. profitability (Im & Workman, 2004). This resulted in that open innovation has to be a positive influence on these factors to be successful for companies.

### **2.6.1. Product/service innovativeness**

Recently there have been many interests in product/service innovativeness (Salomo, et al., 2008). In contrast, it seems that people need a much better understanding of what exactly product innovativeness means (Danneels & Kleinschmidt, 2001). In addition, Danneels & Kleinschmidt (2001) emphasize that there is a difference between the product innovativeness from the customer's perspective and the firm's perspective. This literature review focusses on the B2B perspectives so the meaning of product innovativeness is based on business customer's perspective. There are three dimensions of product innovativeness in the business customer's perspective i.e. innovation attributes, adoption risk and behavior change (Danneels & Kleinschmidt, 2001). Rogers (2003) proposed five innovation attributes to be related to whether and when an innovation is adopted by business customers i.e. relative advantage, compatibility, complexity, trialability, and observability. The most important factor for customers is the relative advantage in comparison with competitors of the firm (Rogers, 2003). Some of the innovation attributes are not applicable for all kind off

product/services this depend on the type of product or service (Rogers, 2003). The second dimension is the effect of the adoption risk on the decision to adopt and the timing of adoption of the service or product (Danneels & Kleinschmidt, 2001). Gatigon & Roberston (1991), distinguish different forms of adoption risk. The first one is performance risk, whether the innovation will perform as expected. The second one is social risk i.e. associated with loss of social status by making an adoption mistake. Finally, physical risk is there a risk of physical harm to the user of the service or product. The last dimension is change in established behavior patterns that the adoption of innovation requires (Danneels & Kleinschmidt, 2001). Gatigon & Robertson (1991) distinguish between continuous innovation, dynamically continuous innovations, and discontinuous innovations. Generally, the discontinuous innovation causes the greatest changes in behavior, which requires the adopter to learn how to use or maintain the innovation (Danneels & Kleinschmidt, 2001). Besides another dimensions that measure the product innovativeness is the objectively customer perspective of the degree of innovativeness of the product (Danneels & Kleinschmidt, 2001). If the majority of the business customers judge the product or service as very innovative, you can conclude that the market is seen it as an innovation (Cheng & Huizingh, 2014). In addition, the use of different core technologies and the involvement of technologies that make old technologies obsolete are dimension that influence the innovativeness of the product or service (Cheng & Huizingh, 2014). Finally, Cheng & Huizingh (2014) focusing on the use of new technologies that permit quantum leaps in performance and on technologies that have a significant impact on changes in the whole industry. To conclude there are many dimensions to judge the innovativeness of a product or service, it depends on the setting, which dimensions a company can use by evaluating their innovativeness.

### **2.6.2. New product/services success**

The second dimension to evaluate the innovation performance of a firm is the new product or service success (Cheng & Huizingh, 2014). As mentioned before, new product success is a dimension of performance that involves the companies' ability to adjust to changing conditions and opportunities in the environment (Walker & Ruekert, 1987). Baker and Sinkula (1999) discuss a few dimensions to measure the new product success. The first are the new product success rate and introduction rate relative to the largest competitor in the market. This has to be judged by the employees of the company itself. Besides the degree of product or service differentiation, the first to the market with new applications and the product cycle time relative to the competition are important parts of new product or service success. Finally, the imagine that a company is an innovative supplier of their service in comparison with their competitors is an important factor of

new product success (Cheng & Huizingh, 2014). As said earlier, it depends on the environment, which dimension a company uses by evaluating the product success.

### **2.6.3. Customer service quality**

The customer service quality is one of the most critical success factors (Drew, 1994). There are some customer performance indicators, which are important to measure the quality i.e. customer value, customer satisfaction, customer loyalty and retention, customer equity, customer reputation, and customer turnover, margins, profit etc. all of these will be explained (Meier et al., 2005). Customers choose products or services, which have the highest customer value for them (Meier et al., 2005). They compare the actual value they receive in consuming the product to the value that they expected, and this affects their satisfaction and repurchase behavior (Kotler et al., 2005) According to Kotler et al. (2005), customer value is defined as value creation from a customer perspective. The next indicator is customer satisfaction, from the company's point of view, customer satisfaction can be considered as the company's ability to fulfil the economical, emotional, and psychological needs of its customers (Griffin & Hauser, 1993). Besides from the customer's point of view, customer satisfaction can be defined as the fulfilment of customers' requirements or needs (Griffin & Hauser, 1993). Another important indicator, which is a positive result of customer satisfaction, is customer loyalty (Storey & Easingwood, 1999). According to Storey and Easingwood (1999), they defined customer loyalty as the behavior customers exhibit, when they make frequent repurchases of product or services of the company or they plan do to it so, and if they intend to recommend the company to other people. Direct indicators of customer loyalty are thus re-purchases, number of recommendations, and the duration of the relationship (Storey & Easingwood, 1999). In addition, customer retention means holding on to customer (Peelen, 2005). From a company's point of view it contains all actions, which lead to customer repurchase or cross buying and avoid that customer migrate to competitors (Peelen, 2005). The next indicator is customer equity, there is no consistent definition of customer equity (Aksoy, et al., 2007). However, it can be defined as a synonym of customer lifetime value: *"A firm's customer equity is the total of the discounted lifetime values of all of its customers"* (Rust, et al., p. 4). In this literature review customer, equity is defined as the current total monetary and non-monetary economical value of a customer for a company. Another important indicator is the customer reputation i.e. the reputation of the company relative to the competitors in the market (Cheng & Huizingh, 2014). The last indicators are very clear i.e. customer turnover, margins and the profit. These financial indicators are regularly measured in most of the companies, and this kind of data can be gathered easily from the account or marketing department or is available in an information system (Wouters, et al., 2012).

#### **2.6.4. Financial performance**

Finally, the last dimension of the innovation performance is the financial performance. Considerable indicators of financial performance are: market share, sales, return on investment and profitability (Im & Workman, 2004). All of these indicators are very clear, so a briefly description based on the book of Wouters et al. (2012) will be given. Market share is the percentage of an industry or market's total sales that is earned by a company over a specified period. Sales is an activity related to selling or the amount of goods or services sold in a given time period. Return on investment is used as performance measure to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. The last one profitability is a ratio that is used to asses a business's ability to generate earnings as compared to its expenses and other relevant costs incurred during a specific period of time.

### **2.7. Elements which influence the innovation performances**

This paragraph discusses the business elements that influence innovation performances. The two important elements are the strategic orientations of stakeholders and technological knowledge diffusion. The importance of stakeholders with open innovation experience, which is also has an influence on the innovation performances, is already mentioned in several previous sections of this literature review.

#### **2.7.1. Strategic orientations**

Not only the different forms of open innovation and the business models are important to improve the innovation performance, also the strategic orientation of the firm has a substantial impact on the innovation performance of the firm (Cheng & Huizingh, 2014). Strategic orientations are defined as *“the strategic directions implemented by a firm to create the proper behaviors for the continuous superior performance of the business”* (Gatignon & Xuereb, 1997, p. 78). Strategic orientations are one of the most important firm resources. (Barney, 1991) They reflect how aggressive companies intend to compete in the market and their willingness to explore and develop competencies, products, or markets (Cheng & Huizingh, 2014). The different strategic orientations decide about the different investments in organization resources, and thus an essential part in which open innovation activities are performed (Cheng & Huizingh, 2014). The three most common strategic orientations that are involved with open innovation are: entrepreneurial orientation, market orientation and resources (technical) orientation (Paladino, 2007).

The entrepreneurial orientation (market push) is a companies' attempt to pursue new market chances and to renew existing areas of operation (Hult & Ketchen, 2001). The values and belief of entrepreneurial orientation are highly proactive toward market opportunities, risk tolerance,

openness to innovative ideas, and actively and intensively supporting the innovation process (Matsuno, et al., 2002). The companies with a strong focus on entrepreneurial orientation are constantly scanning their environment to find new opportunities and new information e.g. customer needs, manage their risk taking, and challenge their competitors, to strengthen their competitive positions (Keh, et al., 2007). The entrepreneurial orientation highlights the spirit of creating new business out of ongoing practices and renewing stagnant companies, which is often accomplished through the introduction of radical innovations (Lumpkin & Dess, 1996). Due to the constant searching for new information, entrepreneurial orientated firms performing inbound activities and explore external sources in greater depth, which may lead to greater innovation performance and especially product / service innovativeness and customer value (Keh, et al.,2007). As mentioned before, the entrepreneurial-oriented firms are more open to new ideas, that is why these firms performing new approaches of outbound activities e.g. corporate business incubation and joint-venture activities (Cheng & Huizingh, 2014; Brunswicker & Chesbrough, 2013). However, the risk-taking nature of an entrepreneurial firm, which is willing to devote the necessary resources to opportunities, may lead to costly failures (Naman & Slevin, 1993).

The most important goal of market orientation (market pull) is creating and maintenance a superior value for customers (Narver & Slater, 1990). Openness plays an important role in this strategic orientation, but the core of the concept consists of acquiring, disseminating, and using market information (Kohli & Jaworski, 1990). Some studies suggest that customer orientation is almost the same as market orientation, although market orientation is a proactive strategy in contrast to the responsive strategy of customer orientation (Zhou, et al., 2005). Due to the focus on customer information, competitor information and other market information e.g. suppliers, market orientation is more than being customer led, and it can lead to radical and incremental innovations (Zhou et al., 2005). That is why companies with a market orientation have better insights in customer needs and strategies of competitors (Cheng & Huizingh, 2014). This deeper market insight probably strength the effect of open innovation, as better knowledge of which solutions are needed in a market and thus the improvement of the external search for solutions (Cheng & Huizingh, 2014). Although, Un et al. (2010) stress that R&D collaboration with customers is found not to affect product innovation. Moreover, market orientation tends to focus the search for external information on existing markets and customers segments while firms with an entrepreneurial orientation scanning markets that are distinct to its own markets (Zhou, et al, 2005). This resulted in that the positive effect of market orientation on product/ service innovativeness and success will be probably less strong than that of entrepreneurial orientation (Cheng & Huizingh, 2014). The last strategic orientation is resources (technical) orientation (product leadership) this addresses how firms

resources drive firms performance in dynamic competitive environments (Collis & Montgomery, 1995). The ultimate goal is to increase the performance of the firm by deploying unique and valuable resources to exploit environmental opportunities or to neutralize threats of the market (Peteraf M. , 1993). Moreover, it is concerned with accumulating a unique resource base that is immobile and heterogeneous (Barney, 1991). The technical part of resource orientation is focusing on “technological push” instead of the “market pull” philosophy of market orientation (Gatignon & Xuereb, 1997). Accordingly, Gatignon and Xuereb (1997) stress, that a technical oriented firm advocates a commitment to R&D, the acquisition of new technologies, and the application of the latest technology. This strategy is internal orientated because the focus lies on the deployment of the firm’s internal resources and state-of-the-art technologies (Cheng & Huizingh, 2014; Zhou et al., 2005). Thus, the focus of firms with a resource orientation will be on deliberate investment in internal resources to get greater returns, and it excels in technical proficiency and flexibility, which are critical drivers for breakthrough innovations (Cheng & Huizingh, 2014; Workman, 1993). However, the focus is overall internal, there are some reasons that resource orientation may fit well with open innovation. A firm recognizes that they do not have the resources in treasury, so they realize that another organization has probably resources to create the innovations (Cheng & Huizingh, 2014). These inbound activities probably improve the speed of the innovation project, increase the results, and decrease the cost, although this is very common for open innovation processes, and has no specific greater value for resource orientation (Cheng & Huizingh, 2014). However, the outbound activities could give a great contribution to open innovation, because of the exploitation of such unique internal resources to external organizations e.g. Joint ventures activities. (Cheng & Huizingh, 2014) Furthermore, the successful commercialization and marketing of a technological innovation requires complementary assets (Teece, 1986). Besides, following Cheng & Huizingh (2014), these assets may be heterogeneously distributed among firms, making open innovation effective. Generally, all the strategic orientations might have a positive influence on the different innovation performances, it depends on the situation and the company which one realize the most value.

### **2.7.2. Diffusion of technological knowledge**

Diffusion of technological knowledge among companies and customers is a big issue due to nowadays technology’s complexity and especially the higher complexity of the buying process in the B2B context. (Kärkkäinen et al., 2001; Ahmad, et al., 2014). Firms with a focus outside the company thus e.g. the entrepreneurial and market orientation might acquire more information about industrial products and services (Nordlund et al., 2011; Olsson & Bosch, 2015) The diffusion of

technology is defined as *“the process in which an innovation is communicated through certain channels over time among the members of a social system”* (Rogers, 2003, p. 5). In marketing and communication, diffusion typically has come to mean the communication of an innovation through the people (Mahajan, et al., 1990). Marinova (2004) emphasizes that shared market knowledge helps firms actualize better return for their innovation efforts, and this may be a source of competitive advantage, but only a small number of studies has threatened this process. Most of the products or services are not like a general commodity, due to this, customers often become confused to making the right choice (Ahmad, et al., 2014). According to Ahmad, et al. (2014) manufacturing industry often faces a communication gap with their B2B customers who do not understand the specific technology. When a manufacturer cannot diffuse the technological knowledge of a technical product, a communication gap may be open up between company and customers about technological knowledge (Ahmad, et al., 2014). As a result, this gap often leads to customers choosing less quality products and related services (Ahmad, et al., 2014). In addition, Mansfield (1968) stresses that the higher the cost, the slower the diffusion but, the higher the perceived profit and relative advantage from an innovation, the faster the adoption, i.e. the decision by customers to use or accept a particular idea, method, or attitude, of the product. Ahmad et al. (2014) give the example of a proper diffusion of tire technology to the customer community is related to sales turn over, which in turn is related to the economic benefits. Thus, companies have to improve the technology knowledge diffusion through direct communication with, manufacturers, wholesalers, and customers (Ahmad et al, 2014). This is in accordance with the open innovation principles of Chesbrough (2003b). In addition, the use of ICT tools and the media increases the brand awareness of companies and thus contribute to reducing the communication gap (Ahmad et al., 2014). To conclude, diffusion of technological knowledge among (potential) customers is of significant importance, to gain competitive advantage (product innovativeness), customer value, and financial performance. The next chapter presents the conceptual model, which is partially derived from this literature study and strengthened by hypothesis-generating research. A conceptual model can guide research by providing a visual representation of theoretical constructs of interest (Creswell, 1994).

### 3. Direct and moderating influences on innovation performances

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The literature overview in the previous section discussed the existing theories on open innovation and innovation performances, as well factors that might influence the relationship between them. This chapter describes the hypotheses development of this master thesis, which is mostly conduct from the literature overview. In addition, hypothesis-generating research is applied by means of approximately 10 qualitative informant interviews with different professionals in the B2B project environment, this is done to gather their subjective experiences about the different factors that influence innovation performances and finally use this information to underpin the scientific literature by formulating the hypothesis. The reason to conduct unstructured interviews is to explore in an informal way the respondents their opinion and get more in depth information (Saunders, et al., 2007). The aspects that are discussed during the informant interviews are described in appendix II. First the conceptual model is discussed, which can be used to analyze the effect of open innovation on innovation performance. Second, the specific relations between the concepts that form the model and the derived research hypotheses are discussed.

#### 3.1. The conceptual model

The conceptual model in figure 7, which is based on frameworks that are used by Hussain & Sweeney (2005) and Adams et al. (2006) consist of seven constructs: an independent variable (open innovation activities) five moderating variables (open innovation experience, diffusion of technological knowledge and the strategic orientations: entrepreneurial orientation, market orientation and resource orientation) and a dependent variable (innovation performances). It is proposed that open innovation performance is determined by open innovation activities and moderated by the moderating variables, which are mentioned before.

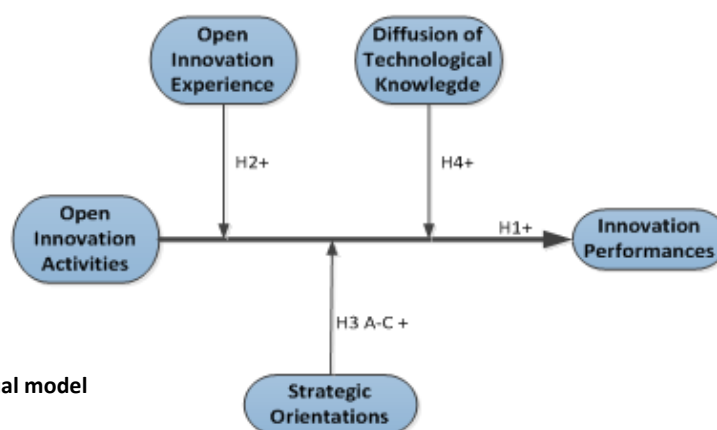


Figure 7: Conceptual model



### **3.2. The hypotheses derived from the conceptual model**

This paragraph presents the six hypotheses, which are derived from the conceptual model. There is one direct effect and five moderating effects.

#### **3.2.1. The direct effect of open innovation activities on innovation performances**

Most studies (e.g. Walter et al., 2001; Chesbrough, 2003; Enkel et al., 2009; Dahlander & Grann, 2010) focus on many different open innovation activities, which lead to a diversity of positive outcomes for companies and consumers. However, it is impossible for companies to have all the knowledge and expertise within their own organization (Kline, 2003). This resulted in that open innovation business models are essential for converting ideas and technologies into economic- and customer value (Chesbrough, 2006). In addition, Chesbrough (2007) states that innovations become economically attractive again for companies due to open innovation activities. Furthermore, Walter et al. (2001) stress that direct value outcomes of a B2B co-creation are: financial value, brand growth, creative communication, consistency in quality and time- and cost efficiency. Moreover indirect values outcomes are: learning activities, enhanced reputation, access to other networks, awareness about competitors and innovations (Walter et al., 2001). More explicitly, Prahalad & Ramaswamy (2004b) emphasize that, it has been proven that B2C open innovation activities have a significant positive influence on the open innovation performances. Finally, involvement in open innovation may enhance the complete business performances (Chaston & Scott, 2012). All the forms of open innovation activities are bundled in this research, thus inbound and outbound are coupled. According to the qualitative interviews with experienced employees in the B2B environment, they emphasize that there is a significant contribution to the innovation performances e.g. the duration of projects might be significantly reduced or due to the collaboration, incremental and radical innovations could be realized. Overall, the way of working is experienced as pleasant during the open innovation activities, because you can intensively discuss with other stakeholders without hiding knowledge, and this may lead to better results. These fallouts of scientific research and qualitative interviews lead to the following hypothesis:

*H1: More intensive open innovation activities lead to an improvement of innovation performances in a B2B project environment.*

#### **3.2.2. The moderating role of open innovation experience**

In the literature review, it is stated that there are many variables, which could influence the direct relationship as mentioned in H1. An important factor of influence is the open innovation experience of companies. Overall Brunswicker & Chesbrough (2013) and Little (2014) stress that many years of

open innovation experience within a company leads to an improvement of the open innovation activities. As mentioned before an important part of the open innovation experience is a well-structured open innovation strategy executed by the involved stakeholders (Koelling et al., 2010). This structured strategy contributes to the collaboration between the stakeholders and therefore has a substantial contribution to the innovation performances (Breuning et al., 2014). Furthermore, Eidem et al. (2014) and Gouillart & Deck (2011) emphasize that stimulation of open innovation activities by the corporate board with e.g. open innovation training sessions and meetings, improves the results of these activities. Thus, more experienced companies have learned from their experiences and will thus be able to manage the open innovation process better (Chesbrough 2003b; Brunswicker & Chesbrough, 2013). According to the professional in the work-field, companies, which have, experience with open innovation activities, might lead the activities and provide guidance through less experienced stakeholders. This is necessary, because the startup phase of the open innovation activities is for most stakeholders not clear, for the reason that in most cases there is no well-structured open innovation strategy available. Thus, the involvement of stakeholders with open innovation experiences is an important condition for improving the performances. Moreover, an experienced stakeholder could give guarantees for quality, stability, and risk mitigation. Hence, the following hypothesis is suggested:

*H2: More open innovation experience positively moderates the relation between open innovation activities and innovation performances in a B2B project environment.*

### **3.2.3. The moderating role of strategic orientations**

In their study, Cheng & Huizingh (2014) have found that strategic orientations of firms have a substantial impact on the innovation performances. For the reason that they are one of the most important firm resources (Barney, 1991). Strategic orientations may moderate the relation between open innovation activities and innovation performance because the achievement of competitive advantages might rest upon strategic orientations in utilizing distinctive innovation capabilities (Walker & Ruekert, 1987; Peteraf, 1993). In this study, there will be tested three types of strategic orientation as moderator namely: the entrepreneurial orientation (market push), the market orientation (market pull) and the resources orientation (product leadership). Due to the constant searching for new inbound and outbound activities, entrepreneurial orientation may cause the greatest innovation performances in comparison with the other two orientations (Lumpkin & Dess, 1996; Keh et al., 2007). In addition, due to this constantly search for new information, entrepreneurial orientation firms explore more external sources in greater depth, which advances

innovation development leads to greater innovation performances (Hung & Chiang, 2010). To conclude the different dimensions of entrepreneurial orientation might works as open innovation drivers (Carvalho & Sugano, 2016). The professionals stress that stakeholders with an entrepreneurial orientation, sometimes come up with total unexpected ideas during the projects, in some circumstances these ideas really contribute to an improvement of the innovation performances. This results in the next hypothesis.

*H3a: Entrepreneurial orientation moderates the relation between open innovation activities and innovation performances in a B2B project environment the most positive in comparison with the other strategic orientations.*

In particular, Zhou et al. (2005) stress that market orientation is much more than being customer led, which can lead to radical and incremental innovations. Deeper market insights might strengthen the effect of open innovation, as better knowledge of what kind of solutions are needed in a market enables a firm to improve its external search for the knowledge needed to provide these solutions (Lichtenthaler U. , 2016). In addition, this resulted in an improvement of the innovation performances due to these companies acquire more information about industrial products and services (Nordlund et al., 2011; Olsson & Bosch, 2015). This resulted in that market orientation facilitates innovations that offer greater benefits to mainstream customers (Zhou et al., 2005). Although, Un et al. (2010) emphasize that R&D collaboration with customers has no significant affect to innovation performances. In addition, Cheng & Huizingh (2014) discuss that the positive effect of market orientation on innovation performance might be less influential than that of entrepreneurial orientation. The professionals suggest that the market orientation is closely related to the market pull principle, therefore it might be the best strategic orientation for B2B project work. For the reason that project work focus on customized products or services, this may be positive related to some parts of the innovation performances because users appreciate products that match their specific needs. Therefore, the following is suggested:

*H3b: Market orientation moderates the relation between open innovation activities and innovation performances in a B2B project environment moderately positive in comparison with the other strategic orientations.*

In their study, Thee et al. (1997) stress that the resources (technical) orientation strategy is the most internal orientated strategy, because the focus lies on the deployment of state-of-the-art

technologies. As a result, that compared to the other two strategic orientations, resource orientation is more internally oriented (Cheng & Huizingh, 2014). Furthermore, Workman (1993) emphasizes that investments in internal resources is a critical driver for breakthrough innovations. However, even the resources orientation might have a positive influence on the innovation performances due to the constant searching for unique resource inside and outside the company to develop breakthrough innovations (Gatignon & Xuereb, 1997). This resulted in the following hypothesis:

*H3c: High levels of resources orientation moderates the relation between open innovation activities and innovation performances in a B2B project environment barely positive in comparison with the other strategic orientations.*

#### **3.2.4. The moderating role of the diffusion of technological knowledge**

A big issue, which might influence the innovation performances, is the diffusion of technological knowledge, due to nowadays technology's complexity and especially in the highly complicated B2B buying processes (Kärkkäinen et al., 2001). This communication of technological knowledge helps firm actualize better return for their innovation efforts, and this may be a source of competitive advantage, which is one of the indicators of innovation performances (Marinova, 2004). Following Ahmad et al. (2014) is a proper diffusion of e.g. tire technology to customers, extremely related to sales turn over, which results in economic benefits. Generally when a company cannot appropriate diffuse the technological knowledge of a technical product, a communication gap may be open up between the companies in the B2B environment about technological knowledge (Nakicenovic, 1991). This resulted in that companies, in a customer role, choosing less quality products and related services (Rogers, 2003). Following the professionals, the diffusion of technological knowledge might deliver more customer value for the end users of the product or service. In addition, this contributes the open innovation process because companies will keep one another up to the mark. Moreover, these discussions with customers during the diffusion of technological knowledge lead to new insights, which meaningful contribute to the quality of the products and thus the innovation performances. For the present study, these relations are used to hypothesize as follows:

*H4: More diffusion of technological knowledge positively moderates the relation between open innovation activities and innovation performances in a B2B project environment.*

The next chapter defines the research methodology of this research study. This methodology will be used to test the hypotheses, which are presented in this chapter.

## 4. The research methodology

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This research is conducted from a realism philosophy, because the essence of realism is *"that what the senses show us as reality is the truth: that objects have an existence independent of the human mind"* (Saunders, et al., 2007 p. 114). Besides, realism assumes a scientific approach to the development of knowledge (Saunders, et al., 2007). This assumption underpins the collection of data and the understanding of those data (Easton, 2010). The research methodology is based on deduction i.e. the testing of a theory by using scientific research (Saunders, et al., 2007). This approach deducing hypotheses, testing these hypotheses and examining the specific outcomes (Robson, 2002). In addition, deduction emphasizes the need to explain relationships between variables (explanatory research), the collection of quantitative data, a structured approach, and researcher independence (Saunders, et al., 2007). The main research strategy that is chosen for this thesis project, and usually is associated with the deductive approach and explanatory research, is the survey (questionnaire) strategy (Saunders, et al., 2007). The results, conclusions and discussions of this research derived from the questionnaires, might be underpinned by qualitative interviews with professionals in the B2B project environment. For this reason, is the conceptual framework that is hypothesized in the previous section tested by quantitative self-administered questionnaires and qualitative semi-structured interviews with professionals in the B2B project work field. The quantitative questionnaires are taken among business customers of Engie Services, a technical service provider. In addition, the respondents of the qualitative interviews are professionals of Engie Service, facilitated in the Netherlands. Therefore ensures the quantitative questionnaire for the most important data and are the qualitative semi-structured interviews used as support for the quantitative data. The following paragraphs discuss the data sample, the design of the measurement instrument, the method of data collection, and finally the method that was used to analyze the data.

### 4.1. Data Samples

The business customers, of different Engie Services departments, are all kind of companies, which have large technical facilities in their buildings e.g. ASML, ABN AMRO, DAF, and Philip Morrison. These business customers could give an objective assessment of the questions in the questionnaire, which is shown in appendix III. The questions are sampled in predetermined latent construct, which are defined by the use of scientific literature. These constructs will be discussed in the next paragraph of this master-thesis. The respondents of the business customers have different roles in their organization e.g. managing board members, project engineers, facility manager, consultant, or sales manager. The goal is to collect at least 50 complete questionnaires, which is necessary to

statistically analyze the data (Hair et al., 2013). Because the customer base of Engie Services is not gigantic, the response rate has to be higher than the normal response rate for external surveys, which is 10-15% (Fryrear, 2015). The qualitative semi-structured interview, which is shown in appendix IV, is conducted with professionals of different Engie Services departments, who are working in a B2B project environment. These professionals are e.g. directors, project leaders, managers and facility managers, which have many years of experience in the work-field. Furthermore, some of them have also many expertise of open innovation and know how to gain more value out of the open innovation activities. The goal is to conduct at least ten semi-structured interviews of approximately one hour with professionals of different Engie Services departments on different locations throughout the Netherlands. The data during the semi-structured interviews is recorded by note taking, which is according to van Aken et al. (2007) an appropriate method. All these notes may give some general frequently cited information, which might be able to be used to support the results. In addition, the information, which is gathered during the interviews, will be used by developing the first draft of the conceptual tool, which will be presented in the design chapter. Finally, the qualitative interviews probably give new insights, which could be used for the conclusion and discussion chapter and especially for the limitations and future research paragraphs. As mentioned before, the qualitative interviews are only to support the data that is derived from the questionnaires.

#### **4.2. Measurement instruments**

In order to retain construct validity, proven measurements items are adopted from the extant literature where possible (Hair et al., 2013). Some items need a bit more explanation, which is discussed below. The questionnaires will be in the native language of the majority of the respondents, namely Dutch. That is because of the higher response rate in native language (Harzing, 1997). Besides, there is also an extreme response in the native language while non-native language questionnaire produce a stronger midpoint response style (Wyse, 2011; The Market Research Society, 2016). Since the list of questions is quite extensive, most of the items that are measured using a Likert-scale have a 7-point distribution in order to make answering easier for respondents. Previous studies (e.g. Dawes, 2012) have shown insignificant differences between 5- and 7- point Likert- scale measurements. However, in this questionnaire the questions have a 7-point Likert-scale, especially to come up with a bit more differences between the variables. Most of the questions in the questionnaire are self-developed questions. However, some of them are adopted and adapted questions, which are used in other questionnaires, for the reason this is more efficient than developing all new questions (Bourque & Clark, 1994). Some control questions are added to verify

that the respondents fill in the questionnaire honestly e.g. to check if the kind of company type match with the company they actually work for. In addition, some Likert-scales are reversed to check if the respondents not judge each question the same. If all the control questions are answered negatively, the questionnaire will be aborted. The questionnaire is reviewed by two doctors namely dr. Gelper and dr. Cloodt with experience in industrial engineering (open innovation) research and statistics. These persons are asked to comment on all the subjects and questions of the questionnaires. A similar approach to test a comparable questionnaire is used by Anderson and West (1998). Subsequently, some employees of Engie Services including the commercial director and the department manager fill in the questionnaire. These persons give comments on questions in order to make these more clearly and specifically for business customers of Engie Services. The following paragraph discusses all the latent constructs and their associated variables based on scientific literature.

#### **4.2.1. Latent constructs**

*Open innovation activities* – There are many variables that might belong to open innovation activities therefore an overall measurement construct will be used. According to the studies of Deck & Storm (2002), Chesbrough (2003a), Ramaswamy (2010) and Gouillart & Deck (2011), the variables 1-9 may belong to the construct Open innovation activities as shown in table 4.

*Experience with open innovation* – For assessing all the variables that belongs to stakeholders their experience with open innovation principles as a construct. The studies of Brunswicker & Chesbrough (2013), Dong et al. (2013) and Little (2014) suggest that variables 10-13 might appertain to the construct experience with open innovation as shown in table 4.

*Entrepreneurial Orientation* – Following the articles of Collis & Montgomery (1995), Hung & Chiang (2010) and Carvalho & Sugano (2016), different dimensions of entrepreneurial orientation works as open innovation drivers. As a result, that the variables 14-15 belongs to the construct entrepreneurial orientation.

*Market Orientation* – The studies of Narver & Slater (1990), Hult & Ketchen (2001), Lichtenthaler (2016) and Kim et al. (2016) suggest that different characteristics of companies belong to the market orientations. As a result, that the variables 16-17 be appropriate for the construct Market Orientation.

*Resources Orientation* – According to Gatigon & Xuereb (1997) and Cheng & Huizingh (2014) are there not so many dimensions, which resulted in a resource orientation. Although some of them are bundled in the construct, which are the variables 18-19.

*Diffusion of Technological Knowledge* – The assessing of the variables that belongs to the construct of diffusion of technological knowledge and the ensuing communication gap. The studies of Nakicenovic (1991), Rogers (2003), Remneland-Wikhamn et al. (2011), and Ahmad et al. (2014) suggest that the variables 20-25 might relate to the construct diffusion of technological knowledge.

*Innovation performances* – There are unlimited variables present in scientific literature that could indicate innovation performances. The studies of Walker & Ruekert (1987), Im & Workman (2004), Kotler et al. (2005), Salomo, et al. (2008), and Wouters et al. 2012) have been used to define the variables 26-34 for this study.

*Control variables*- Several control variables are measured: the size of the company, the type of company and response options to fill in. These are not presented in table 4.

### **4.3. Data collection**

The commercial director of Engie Services South Netherlands approved the final version of the questionnaire, at 6 September 2016 to send to business customers of Engie Services. On 15 September, the commercial director offered me a list included all the names of the business customers and the corresponding contact persons, email addresses, and project numbers. The total list has 1800 rows, which after research has 400 unique contact persons of approximately 250 unique business customers of the last 5 years. Usually the largest business customers and its major projects in terms of size and finances had more contact persons for one project. Subsequently, a number of possible respondents were removed as a result of dubious email addresses and missing information. Finally, the questionnaires were sent to 332 unique contact persons of the business customers by email between 19 and 22 September. These emails include a unique hyperlink for each respondent to fill in the online questionnaire of 33 questions on Google Forms, in order to match the respondents with the correct project number. In addition, the names of the contact persons of Engie Services with whom the respondents have done business are mentioned to make them hopefully more familiar and confident with the completion of the questionnaire. Approximately 88 emails were not delivered at the email address of the potential respondents, due to they do not work anymore for the company or for the reason they have a new email address. This resulted in that 244 potential respondents had received the hyperlink to fill in the questionnaire. In total 62 of these respondents completed the questionnaire. Six respondents were deleted since the kind of company they answered to work for not match the actual company they work for, or they had answered almost each question the same, as well on the control questions. This resulted in N=56 valid and unique questionnaires at 7 October, which is a response rate of almost 23%. The sample consists of respondents, which work for about 15 different types of businesses e.g. high technical industries, bio



industries, logistics, ICT, and hospitals. Besides, the respondents work for companies that had less than 10 employees or more than 2000 employees. This data is used for the analyzes, which are described in the next paragraph. In the same way, the manager of Engie Services BA Oisterwijk approves the semi-structured interview protocol. Subsequently, the interviews were held between October and December 2016. In total 12 interviews with professionals have taken place on different locations of Engie Service in the Netherlands e.g. in Maastricht and Arnhem.

#### **4.4. Method of analysis**

The original output data is first processed by using R for Windows, RStudio Desktop 1.0.44 and Microsoft Excel 2010. Assessment of the data and model validity is performed using test procedures from Tabachnick & Fidell (2012) and Hair et al. (2013) and the cut-off values are adopted accordingly. For analyzing the conceptual model, different steps are used to test the corresponding hypothesis as, in effect, comparing the collected data with what is theoretically expected to happen (Robson, 2002). As mentioned before this research study will make use of Exploratory Factor Analysis (EFA); this is a statistical approach for dimension reduction that can be used to analyze the interrelationships among a large number of variables (Tabachnick & Fidell, 2012). Within a standard EFA, the factors loadings of the measured variables, should be greater than 0.5 to used together as a latent construct (Peterson, 2000). However, in this research study, specific variables are bundled together according to scientific literature and these form the latent constructs. Thereby is high multicollinearity (vif) between the variables not important issues in this research study, because of the predefined latent constructs by the scientific literature (Tabachnick & Fidell, 2012). The first step of the analysis is detecting multivariate outliers by using the Mahalanobis distance. If there are outliers showed by the boxplot, then these observations have to be removed from the dataset (Hair et al., 2013). In addition, the questionnaire ensures that there is no missing data in the dataset so this is not an issue in this statistical analysis. Subsequently it is necessary to test the reliability of the measurement by making use of the Cronbach's alpha test. In addition, a Cronbach's alpha score of 0.7 or higher indicates unidimensionality of the construct (Cortina, 1993). Moreover, the correlation coefficient and related significance of some variables is tested because the constructs in tables 4 and 5 have not enough different variables to conduct a correct Cronbach's alpha test (Hair et al., 2013). In particular refers the relation of internal validity to questionnaires to the ability of the questionnaire to measure what the research intend to measure, the data must be trustworthy (Saunders et al., 2007). A common way to check validity is to randomly split the data in two parts, and thereafter estimate the Cronbach's alpha score to each data partition separately, and compare these scores (Hair et al., 2013). The scores should be comparable to demonstrate the validity (Hair et

al., 2013). The next step after investigating the customized EFA is to conduct multiple regression analysis. This method is by far the most widely used and versatile dependence technique, which is applicable in almost every facet of business decision-making (Hair et al., 2013). For the reason, that this kind of analyzing fits perfectly to this research study. Multiple regression analysis is a general statistical technique used to analyze the relationship between the depend variable: innovation performances and several independent variables (the other latent constructs). The models that are tested contain always the direct influence of the construct open innovation activities on the construct innovation performances and subsequent the influence of each separately moderator on the previous mentioned direct relation. Due to these checks, also the hypotheses of chapter 3 will be tested. In addition, added variable plots will be used to check if there have to be included quadratic, log-transformation, or other terms to the constructs. Finally, the constant variance of the error term will be tested to prove if there is homoskedasticity this is the so-called Breusch-Pagan (BP) test (Hair et al., 2013). If there is heteroskedasticity, then the ordinary least squares are still valid, but the standard errors are not (Tabachnick & Fidell, 2012). Through this there need to be done changes in the model specifications, this resulted in the heteroskedasticity-robust standard errors and corresponding t-values and p-values are the correct values. This method of analysis is used for the data-analysis in the next chapter. The external validity of a study means the generalizability of the conclusions of a research study to the external environment (Sekeran & Bougie, 2010). This study might be generalizable for other organizations, which work on project base in a B2B context with other stakeholders. To illustrate, in case that open innovation activities significant influences innovation performances, this might be the same for some other companies that are active in a B2B project environment. For the reason that there are about 15 total different types of business involved in this research, which are already mentioned in this chapter. To conclude, this research methodology fits perfectly to the quantitative data, which is derived from the questionnaires. By this methodology, therefore might give significant results in the next chapter of this research study.

## 5. The data analyses to investigate the hypotheses

This chapter first presents the measurement analysis and the multiple regression analysis with corresponding results.

### 5.1. The measurement analysis

In order to assess the validity, scientific literature is used to bundle variables to latent construct. Subsequently, the Cronbach's alpha are used to test the reliability of these latent construct. In addition to ensure reliability the correlation and significance of some variables is given. Finally the data set is split into two randomly partitions to statistically prove validity of the measurement. As you can see in table 4 the Mean and Standard Deviation (S.D.) of the different constructs and variables have no extreme values. However, it is noted that the means of the variables belonging to the construct diffusion of technological knowledge are higher than the other means. This might indicate that the companies overvaluing their own technical knowledge. Besides, variable 13 of open innovation experience is removed because of increased reliability (Cronbach's alpha from 0.78 => 0.90). Moreover, variable 25 of diffusion of technological knowledge is removed because of a relative low mean and increased reliability (Cronbach's alpha from 0.72 => 0.81). In contrast, the correlation of the different strategic orientations is very low and only the correlation of the resource orientation is significant. This is surprisingly, according to the scientific literature might the strategic orientation variables strongly correlate. To ensure validity of the measurement, the two partitions show that the Cronbach's alphas are comparable to each other. Finally, in table 5 are the correlation coefficient and significance of the constructs presented. Between the different strategic orientations is a significant negative correlation, although in this research is it not necessary that these constructs have a correlation. Due to this research supposed to show the different influences of the strategic orientations as moderator on the innovation performances.

**Table 4: Constructs and associated variables.**

Construct Item	Mean	S.D.	Cronbach's Alpha	Correlation and p-value	Partition 1	Partition 2
<b><i>Open Innovation Activities</i></b>	<b>4.22</b>	<b>1.16</b>	<b>0.90</b>		<b>C. alpha 0.86</b>	<b>C. alpha 0.92</b>
1. Satisfaction with the cooperation	4.95	1.44				
2. Provide new insights	4.05	1.26				
3. Understand expectations and needs	4.66	1.47				
4. Co-creation solutions	3.86	1.89				
5. Degree of collaborations	4.57	1.67				
6. Applying of recommendations	4.16	1.42				
7. Involvement of external parties	4.11	1.86				
8. Openness to OI	4.09	1.40				
9. Share of knowledge	3.55	1.56				

<b>Open Innovation Experience</b>	<b>4.17</b>	<b>1.60</b>	<b>0.90 (with variable 13 = 0.78)</b>	<b>C. alpha 0.90</b>	<b>C. alpha 0.91</b>
10. Collaboration experience	4.18	1.70			
11. OI stimulation	4.63	1.81			
12. OI structured strategy	3.71	1.76			
<b>13. NIH syndrome (Item Removed)</b>	<b>4.84</b>	<b>1.52</b>			
<b>Entrepreneurial Orientation</b>	<b>3.60</b>	<b>1.13</b>		<b>Cor. 0.198</b>	<b>Cor. 0.164</b>
				<b>P-value 0.144</b>	<b>P-value 0.405</b>
14. 1st Entrepreneurial orientation	4.00	1.44			<b>Cor. 0.351</b>
15. 2nd Entrepreneurial orientation	3.19	1.47			<b>P-value 0.067</b>
<b>Market Orientation</b>	<b>4.51</b>	<b>1.06</b>		<b>Cor. 0.143</b>	<b>Cor. -0.041</b>
				<b>P-value 0.294</b>	<b>P-value 0.83</b>
16. 1st Market orientation	4.80	1.47			<b>Cor. 0.36</b>
17. 2nd Market orientation	4.21	1.33			<b>P-value 0.06</b>
<b>Resource Orientation</b>	<b>3.89</b>	<b>1.10</b>		<b>Cor. 0.266</b>	<b>Cor. 0.358</b>
				<b>P-value 0.048*</b>	<b>P-value 0.061</b>
18. 1st Resource orientation	3.79	1.33			<b>Cor. 0.016</b>
19. 2nd Resource orientation	4.00	1.44			<b>P-value 0.939</b>
<b>Diffusion of technological knowledge</b>	<b>4.97</b>	<b>1.07</b>	<b>0.81 (with variable 25 = 0.72)</b>	<b>C. alpha 0.88</b>	<b>C. alpha 0.74</b>
20. Functional knowhow	5.30	1.39			
21. Technical knowhow	5.04	1.49			
22. Diffusion during collaboration	4.75	1.60			
23. Technological gap before start p.	4.66	1.38			
24. Technological gap after finishing p.	5.10	1.22			
<b>25. Big gap leads to focus on price (Item Removed)</b>	<b>3.84</b>	<b>1.82</b>			
<b>Open Innovation Performances</b>	<b>4.14</b>	<b>0.84</b>	<b>0.82</b>	<b>C. alpha 0.78</b>	<b>C. alpha 0.85</b>
26. Relative advantage	4.32	1.06			
27. Positive image	4.39	0.78			
28. Change in the way of working	3.16	1.33			
29. Innovativeness of the service/product	3.95	1.00			
30. Differentiation of the product	3.64	1.31			
31. Meet the expectations	4.48	1.44			
32. Customer loyalty	4.20	1.68			
33. Value added service	4.16	1.36			
34. Profit	4.98	1.63			

**Table 5: Correlations of the constructs**

Constructs	OIA	OIE	EO	MO	RO	DoTK	OIP
<i>Open Innovation Activities (OIA)</i>	x						
<i>Open Innovation Experience (OIE)</i>	0.283*	x					
<i>Entrepreneurial Orientation (EO)</i>	-0.204	-0.006	x				
<i>Market Orientation (MO)</i>	-0.012	0.067	-0.492***	x			
<i>Resource Orientation (RO)</i>	0.219	-0.058	-0.548***	-0.458***	x		
<i>Diffusion of technological knowledge (DoTK)</i>	0.476***	0.408**	-0.241	-0.033	0.278*	x	
<i>Open Innovation Performances (OIP)</i>	0.807***	0.159	-0.205	-0.088	0.294*	0.459***	x
Significance codes:	*** =0	**=0.001	*=0.05				

## 5.2. The results of the multiple regression analyses

The conceptual model that represents the hypotheses is assessed by means of multiple regression analyses. This multiple regression analysis tests six different models to accept or reject the hypothesis. First, all the models will be assessed via the Breusch-Pagan (BP) to ensure that there is evidence for homoskedasticity. As a result, the values of the ordinary least squares regression output are valid. However, if the Breusch Pagan test demonstrates that there is heteroskedasticity then the heteroskedasticity-consistent standard errors of the multiple regression models will be given.

### 5.2.1. The direct influence on innovation performances

Model 1 tests the direct influence of open innovation activities on the open innovation performances. The model suffers from heteroskedasticity (BP = 7.083; df 1; p-value 0.00778) so the heteroskedasticity-consistent values of model 1 can be found in table 6.

**Table 6: Results of model 1**

<b>Model 1: Direct influence of OI activities on innovation performances</b>				
<i>Coefficients</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
(Intercept)	1.6629	0.3266	5.0907	4.646e-06***
Construct OI Activities	0.5874	0.0689	8.5236	1.422e-11***
R squared	0.6516	Adjusted R Squared	0.6451	

The p-value of open innovation activities is lower than 0.05, (the significance codes are the same as mentioned in table 5) so this provides supporting evidence for hypothesis 1. We can conclude that open innovation activities have a significant positive influence on the innovation performances. This is in accordance with the scientific literature and the qualitative interviews. In the next chapters will be explained how companies in the B2B project environment might gain the most value out of these open innovation activities.

### 5.2.2. The moderating effects on innovation performances

The first moderator that might influence the direct relationship between open innovation activities and open innovation performance is the open innovation experience of the stakeholders. Model 2 is homoskedastic (BP = 6.3994; df = 3; p-value = 0.09372), so all the values of the multiple regression model in table 7 are correct.

Table 7: Results of model 2

<b>Model 2: Direct influence of OI activities on innovation performances moderated by OI Experience</b>				
<i>Coefficients</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
(Intercept)	2.0398	0.5597	3.645	6.18e-04***
Construct OI Activities	0.5355	0.1326	4.037	1.78e-04***
Construct OI Experience	-0.1199	0.1471	-0.815	0.4186
Construct OI Activities x Construct Experience	0.0189	0.0329	0.573	0.5690
R squared	0.659	Adjusted R squared	0.6393	

The p-value of the moderator (Construct OI Activities x Construct Experience) is higher than 0.05 so there is no supporting evidence for hypothesis 2. The R<sup>2</sup> and adjusted R<sup>2</sup> are almost equal to model 1 thus, there is no difference in the fit of the models. Surprisingly we can conclude that this result is not in accordance with the scientific literature and the qualitative interviews. The impact of open innovation experience in the B2B environment might be less influent the performances than previously assumed. According to the literature, it could positively influence the collaboration process but finally this has not a significant stimulus on the innovation performances.

The second moderator that might influence the direct relationship between open innovation activities and open innovation performance is the entrepreneurial orientation of the stakeholders. Model 3 is also homoscedastic (BP = 5.8767; df = 3; p-value = 0.1178), so all the values of the multiple regression analysis in table 8 are correct.

Table 8: Results of model 3

<b>Model 3: Direct influence of OI activities on innovation performances moderated by Entrepreneurial Orientation</b>				
<i>Coefficients</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
(Intercept)	3.8819	1.0632	3.651	6.06E-04***
Construct OI activities	0.0977	0.2400	0.408	0.6851
Construct Entrepreneurial Orientation	-0.6120	0.2852	-2.146	0.0367*
Construct OI Activities x Construct Entrepreneurial Orientation	0.1373	0.0660	-1.312	0.0425*
R squared	0.680	Adjusted R Squared	0.6615	

The p- value of the moderator (Construct OI Activities x Construct Entrepreneurial Orientation) is lower than 0.05 this provides supporting evidence for hypothesis 3a. The R<sup>2</sup> and adjusted R<sup>2</sup> are slightly higher than the previous model so it fits a bit better. We can conclude that the entrepreneurial orientation positively moderates the direct relation between open innovation activities and the innovation performances. This is in accordance with the literature, which stated explicit that stakeholders with the entrepreneurial orientation contributes the most to the innovation performances. Therefore, the choice for stakeholders with the entrepreneurial orientation positively influences the final performances of the project.

The third moderator is also a strategic orientation namely the market orientation. This market orientation may moderate positively the direct relationship between open innovation activities and open innovation performance. Model 4 suffers from heteroskedasticity (BP = 13.402; df = 3; p-value = 0.0038). This resulted in that the heteroskedasticity-consistent values of model 4, which can be found in Table 9.

**Table 9: Results of model 4**

<b>Model 4: Direct influence of OI activities on innovation performances moderated by Market Orientation</b>				
<i>Coefficients</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
(Intercept)	1.8334	22.840	0.803	0.4256
Construct OI Activities	0.6145	0.5067	1.213	0.2307
Construct Market Orientation	-0.0382	0.5217	-0.073	0.9419
Construct OI Activities x Construct Market Orientation	-0.0059	0.1145	-0.052	0.9588
R squared	0.6579	Adjusted R Squared	0.6382	

The p-value of the moderator (Construct OI x Construct Market Orientation) is higher than 0.05, so there is no supporting evidence for H3b. In addition, the R<sup>2</sup> and adjusted R<sup>2</sup> are lower thus, also the model fit is not improved. We can conclude that this result is not in accordance with the literature and qualitative interviews, which suggest a slightly positive effect of stakeholders with a market orientation on the innovation performances. However, this effect is already suggested to be not so strong that is why this result is not total unexpected. The market orientation does not influence the performances and is through this not an important condition for the stakeholders.

The last strategic orientation is the resource orientation, which also might moderate positively the direct relationship between open innovation activities and open innovation performance. Model 5 is

homoscedastic (BP = 8.1475; df = 3; p-value = 0.05103), so all the values of the multiple regression analysis in Table 10 are correct.

**Table 10: Results of model 5**

<b>Model 5: Direct influence of OI activities on innovation performance moderated by Resource Orientation</b>				
<i>Coefficients</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
(Intercept)	0.3152	0.8677	0.363	0.7178
Construct OI Activities	0.8402	0.2160	3.890	2.86e-04***
Construct Resource Orientation	0.3746	0.2220	1.687	0.0976
Construct OI Activities x Construct Resource Orientation	-0.0705	0.0537	-1.312	0.1954
R squared	0.6769	Adjusted R Squared	0.6583	

The p-value of the moderator (Construct OI x Construct Resource Orientation) is higher than 0.05 so there is no supporting evidence for H3C. In addition, the R<sup>2</sup> and adjusted R<sup>2</sup> are almost equal to the previous models. We can conclude, which is also suggest by the literature, that the resource orientation has the lowest impact on the innovation performances, although this result is not significant. As a result, the resources orientation does not influence the innovation performances and is through this not an important condition for stakeholders.

The last moderator is the diffusion of technological knowledge. Model 6 is homoscedastic (BP = 6.7824; df = 3; p-value = 0.07917), so all the values of the multiple regression analysis in table 11 are correct.

**Table 11: Results of model 6**

<b>Model 6: Direct influence of OI activities on innovation performances moderated by the diffusion of technological knowledge</b>				
<i>Coefficients</i>	<i>Estimate</i>	<i>Std. Error</i>	<i>t-value</i>	<i>p-value</i>
(Intercept)	1.0947	1.0578	1,035	0.3056
Construct OI Activities	0.6462	0.2834	2.280	0.0267*
Construct Diffusion	0.1449	0.2209	0.656	0.5147
Construct OI Activities x Construct Diffusion	-0.0186	0.0556	-0.334	0.7396
R squared	0.6594	Adjusted R Squared	0.6398	

The p-value of the moderator (Construct OI Activities x Construct Diffusion) is higher than 0.05, so there is no supporting evidence for H4. In addition, the R<sup>2</sup> and adjusted R<sup>2</sup> are almost equal to the



previous models. Surprisingly we can conclude that this result is not in accordance with the scientific literature and the qualitative interviews. Almost all the literature and qualitative interviews expected that intensive diffusion of technological knowledge effectively contribute to an improvement of the innovation performances. In addition, there is a strong positive correlation between the construct diffusion of technological knowledge and innovation performances. However, diffusion of technological knowledge is a time consuming activity it might be this has a negative effect on the innovation performances. The results in this chapter will be used, inter alia, to develop the conceptual management tool in the next chapter.

## 6. Design of the conceptual management tool

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Apart from the previous results, are the most important sources for this conceptual management tool the standard project plans and -approaches of Engie Services, which are adapted to add opportunities for open innovation activities. In addition, the literature review, the qualitative interviews, and the focus-group meeting provide in making of the flowchart in figure 13. The flowchart is thus a partly self-developed conceptual management tool. To clarify: *“A conceptual management tool is a structured, model based way of proceeding to improve the problem solving or decision making process either individually or for a group in an organizational context. A conceptual tool achieves this by providing thought structures, action steps, and representation formats to facilitate convergent (analytical) or divergent (creative) thinking”* (Eppler, 2000, p. 2). This flowchart can be used by all types of companies in the B2B project environment. The first draft of the flowchart visually displays interrelated information e.g. events, steps in a process and information functions, in an organized fashion, such as sequentially or chronologically (Harris, 1999). The draft of the flowchart and related 2x2 matrixes, which in fact are parts of the flowchart, are discussed in a focus group meeting with seven project leaders and managers of Engie Services, which can use this flowchart as tool for project management. The information in the 2x2 matrixes are just like the entire flowchart based on the scientific literature, the quantitative data, the qualitative interviews, and this focus-group discussion. In a focus-group meeting share employees, their thoughts and experiences on a set off topics in the flow diagram (Morgan & Spanish, 1984). As a resulted, the dialogues in the focus-group have contributed to the final flowchart and 2x2 matrixes, which are also approved by the employees. The reason to develop a flowchart is that all kind of companies in the B2B (open innovation) project environment can use this as **decision making tool**, or just as **information/guideline source** during their projects (Fryman, 2001). For example, a new project triggered by the focal firm itself, for the development of a new ICT program. The flowchart reminds the firm to think about open innovation opportunities and to consider the different strategic orientations to carry out during the project. In order to provide the users of the flowchart with additional information sources, are the 2x2 matrixes (figure 8-12) developed. The 2x2 matrixes and the specific project information, in figure 13 are they showed as the data boxes with thick outlines that are horizontal connected to the vertical sequential steps in the flowchart. Figure 8-12 shows the details of these data boxes. These can be used by project managers as information sources and discussion tools to define the appropriate strategy for a specific project. The 2x2 matrixes structure information according to two behavioral criterial, which are subdividing into two levels such as high and low or positive and negative (Lowy & Hood, 2010). Figure 8 is used to give an example about the

2x2 matrix. For instance, the project managers of different stakeholders discuss that they will invest in open innovation activities during this project. Thus in the 2x2 matrix in figure 8, is the left variable open innovation activities, in this example project high. Besides, the project managers also try to achieve huge innovation performances, thus the focus on innovation performances is also high in this example project. This resulted in that in this example the right upper surface of the 2x2 matrix of figure 8 should be sought. According to this complete research study and the scientific literature will this strategy lead to overall significant higher results. The project managers use the details of this specific 2x2 matrix of figure 8 and 9 at the first decision point (the rhombus figure: Project has huge OI prospects?) of the flowchart. With the result that this additional information source might influence the project managers choice to conduct this project in a **not standard** way, which is shown on the left side of the flowchart (Define the Strategy). Now the link between the flowchart and the 2x2 matrices is clarified, some important remarks about the flowchart will be explained:

- The first step is a new project which could be triggered internal, or by external organizations.
- The focal firm assesses first the value of the project for their organization.
- With the aid of the 2x2 matrixes (fig. 8-9) and the OI information about the project will all stakeholders make the decision if the project has huge OI prospects.
- The answer is no, the standard project procedures will be followed.
- The answer is yes, the specific strategy for this open innovation project will be defined.
- The 2x2 matrixes of the strategic orientations (fig. 10-11) give the stakeholders extra information to consider if they want to pursue high levels of a specific orientation.
- The 2x2 matrixes of diffusion of technological (fig. 12) knowledge give the project stakeholders extra information by the making of the action plan.
- The evaluation of the projects with all stakeholders will be used in the future to compare various projects with diverse strategic orientations and as advice for new projects.
- The resource orientation is not included in this flowchart for the reason that it has according to the results and the interviews no positive influence on the innovation performances.

The goal of this complete conceptual management tool is to provide managers of organizations, active in the B2B project context, new information, and guidelines, which can help them by their decision-making procedures. Due to the fact that not all the results of this research study are significant, is it necessary for managers to discuss their decisions in specific circumstances. Through this is it in some projects, therefore, for example necessary to diffuse more intensively technological knowledge than other projects. Thus, this tool gives managers extra information and guidelines to conduct these important choices and decision-making procedures with other stakeholders.

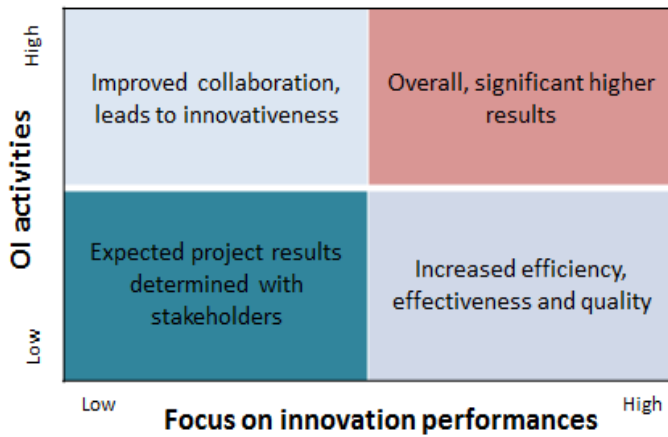


Figure 8: 2x2 matrix OI activities x Focus on innovation performances

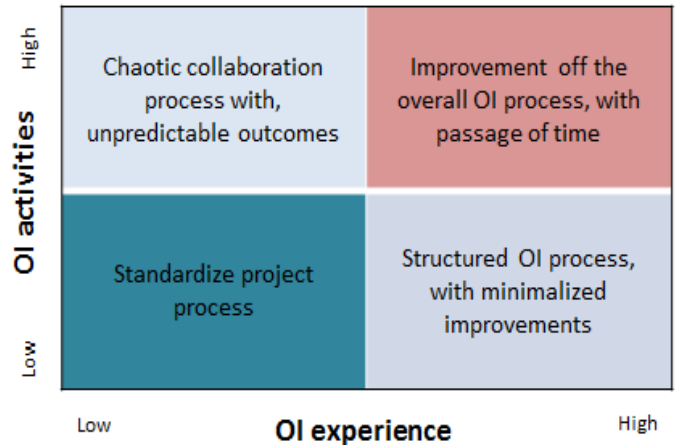


Figure 9: 2x2 matrix OI activities x OI Experience

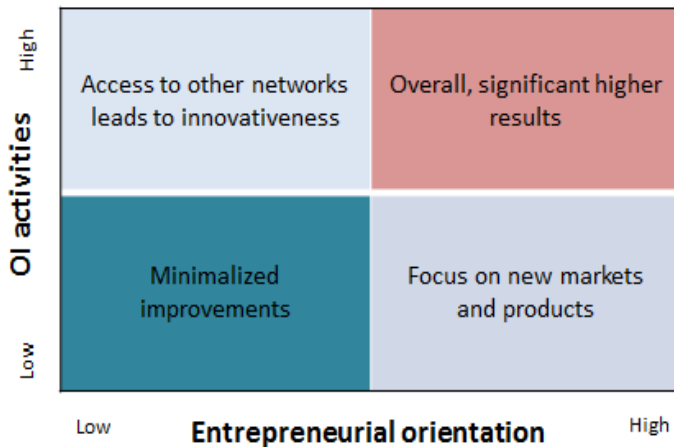


Figure 10: 2x2 matrix OI activities x Entrepreneurial orientation

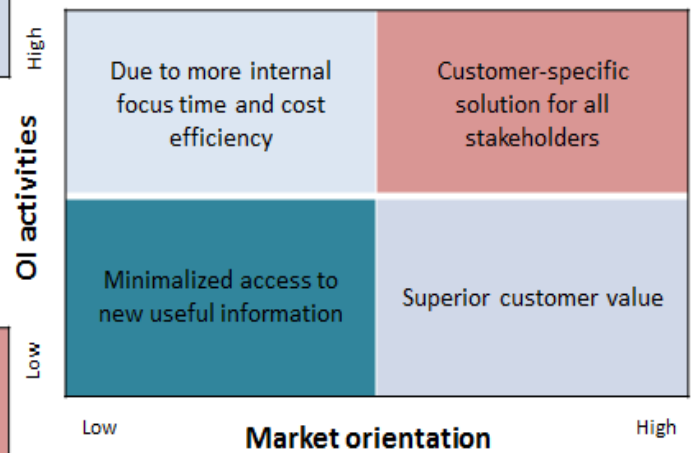


Figure 11: 2x2 matrix OI activities x Market orientation

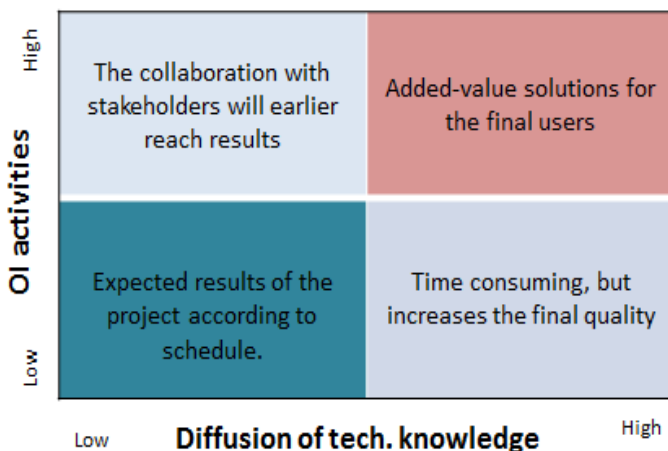


Figure 12: 2x2 matrix OI activities x Diffusion of tech. knowledge

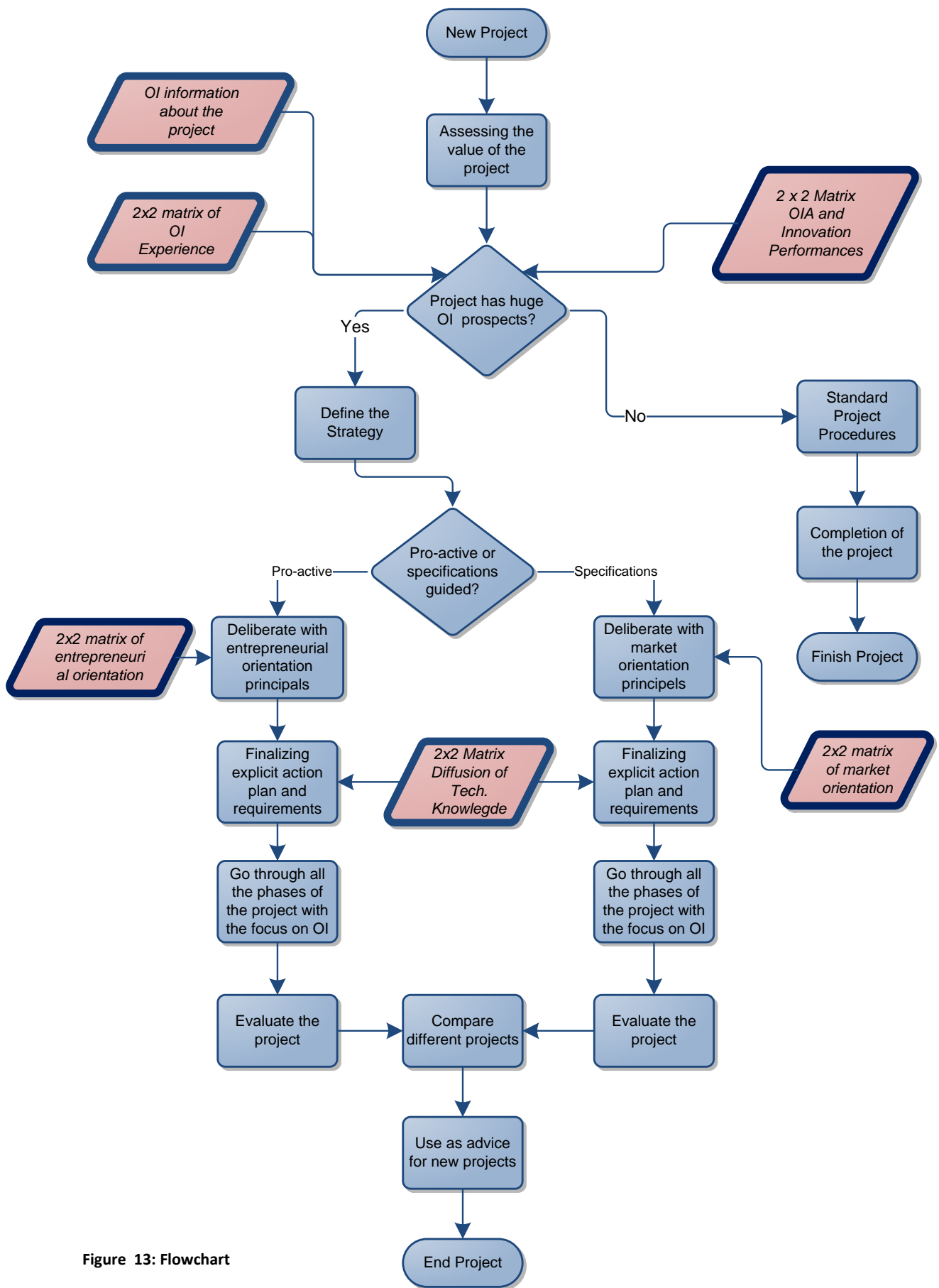


Figure 13: Flowchart

## 7. The contribution of this study to the industrial world

The motivation of this study is to better understand the impact of open innovation activities on the innovation performances in a B2B project environment, and to investigate the moderating role of open innovation experience, strategic orientations, and diffusion of technological knowledge. Moreover, the author aimed at filling the literature gap concerning support for B2B open innovation activities. As mentioned before the research question of this study is: *How can companies in a B2B project environment gain the most value of open innovation activities and improve the innovation performances?* This chapter firstly discusses the major findings of the empirical model and derivative conclusions. Second, the theoretical and managerial implications of this master thesis are discussed. Lastly, the limitations of the current study and directions for future research are presented.

### 7.1. The main conclusions of this research

The main focus of this chapter is the interpretation of the results, which are presented in the previous chapters and summarized in the empirical model in figure 14 (Saunders, et al., 2007).

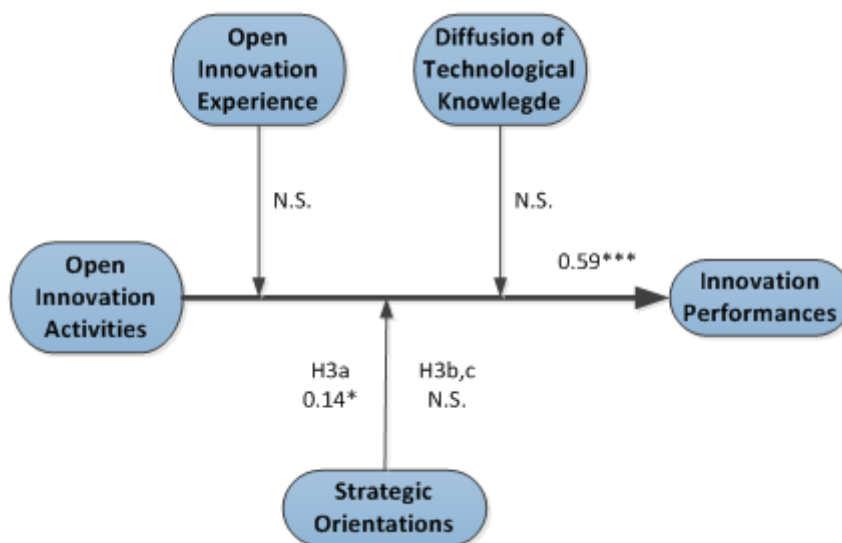


Figure 14: Empirical Model

As a general conclusion, it can be stated that intensive open innovation activities in a B2B project environment are significantly and positively related to the innovation performances and thus enhances the performances. This is a broad range of innovation performances indicators namely: product/service innovativeness, new product/service success, customer service quality, and financial performance. For example the development of new ICT software by the focal firm for specific business customers. Due to intensive open innovation activities, such as IP in-licensing and co-creation with stakeholders during all the phases of the project, will increase the innovation

performances for all the stakeholders. This might be an increase of profit for the main developer of the software, an increase of customer satisfaction for the users as well enrichment of knowledge for other stakeholders. However, this conclusion asks for several attenuating and more elaborate remarks. In particular, is the positive influence of open innovation activities on innovation performances, applicable to all kind of companies of any size in a B2B project environment. Although due to the limited sample size and the wide variety of companies is the data not representative enough to control what type or size of the companies have the most positive and significant influence on the innovation performances. This could be one of the reasons why some companies might gain more value out of the open innovation activities in comparison with other companies. Besides, due to the improvement of the innovation performances will increase the value for the end-users (Cagan & Vogel, 2002). For example a client of a company with new customized ICT software, will gain due to the new software much more value, but this end-user is not involved in the B2B open innovation activities. As a result, the users (B2B) and end-users (clients of the companies) gain more value, which leads to an increase of loyalty to the main company (Woodruff, 1997).

Not only the open innovation activities are essential to improve the innovation performances, also the strategic orientations of stakeholders have an essential contribution to the performances. Especially the entrepreneurial orientation, which has the strongest moderation effect in comparing with the other orientations. The proactive market push focus, which is part of the entrepreneurial orientation, ensures that this orientation has similarities with the open innovation activities and provides besides new information and opportunities for all the stakeholders. In contrast, the other strategic orientations namely, market and resources orientation do not positively contribute to the innovation performances. To illustrate, some aspects of the market orientation might have a positive influence on innovation performances such as deeper market insights and acquiring of new information, although due to being mainly customer led are the positive effects attenuated. In addition, the range of focal outside entities (generally business customers) may be too limited for strengthening the effect of open innovation. Moreover, the resource orientation is too much focused on the development of technologies and therefore especially internally orientated. In the same way is the impact of the open innovation experience also almost negligible. This experience could according to the qualitative interviews help in organizing and directing of the open innovation activities but has finally no positive influence on the innovation performances. However, a few stakeholders with open innovation experience are highly desirable to make a good start with the open innovation activities and ensure a minor failure of stakeholders. Surprisingly, does also the diffusion of technological knowledge not contribute to an improvement of the innovation performances. Due to diffusion of technological knowledge will increase the value for the users as

well end-users of the product (Ahmad et al., 2014). However, it appears that diffusion of technological knowledge take so much effort and time which could result in a decrease of the innovation performances, because a change in priorities and division of labour of the stakeholders. In particular, is intensively conducting all types (inbound, outbound, and coupled) of open innovation activities essential to achieve the greatest innovation performances in a B2B project environment. It is also important that the stakeholders, who are involved in the open innovation activities, doing business from an entrepreneurial orientation point. This will ensue the exchange of many new ideas between all the stakeholders, which might be used within the final project. In addition, stakeholders with clear expertise in open innovation should guide the collaboration process between the stakeholders. To conclude, project work could be more innovative if there is compliance with the open innovation activities and due to a constant search for new opportunities within the project guidelines. This conclusion is used for the theoretical and managerial implications in the next paragraphs.

## **7.2. Discussion of the theoretical implications**

The target of this study is to provide quantitative support for the positive impact of open innovation activities on the innovation performances in the B2B project environment. Since this topic had not yet been addressed in the extant literature, the main contribution of this study is to provide further understanding of open innovation and its consequences (Kärkkäinen, et al., 2011). The most important finding is that the results of this paper provide support for the hypothesis that intensive open innovation activities increase the innovation performances. This finding is an external validation to most stakeholders in a B2B project environment. Especially the coupled open innovation activities thus both inbound as well outbound e.g. co-creation and IP out-licensing contribute together to an improvement of the innovation performances. Due to this, only coupled open innovation activities could be proven as a significant positive influence on innovation performances and therefore could be used as scientific information for other research studies. As a result, researches could argue that coupled open innovation activities enlarge: product/service innovativeness, new product/service success, customer service quality, and financial performances. However, this research makes no distinction about, which performances indicators is influenced more by coupled innovation activities in comparison with another performances indicator. Therefore, this research could only claim that the four performances indicators generally improve. Besides, in line with earlier studies (e.g. Cheng & Huizingh, 2014), this study prove the positive moderating effect of a clear strategic orientation on the relation between open innovation and innovation performance. However, to the author his best knowledge, no positive influence of the



moderator entrepreneurial orientation on the relation between open innovation and innovation performances in a B2B project environment is shown in recent literature. Thus, this study adds information to the scientific literature that organizations with an entrepreneurial orientation obtain the best results through the open innovation activities, and thus strengthening the effect of open innovation.

Contrary to what is claimed in literature, has experience with open innovation no specific contribution to the innovation performances. The experienced stakeholders could give guarantees for quality, stability, and risk mitigation (Little, 2014). These might give the involved stakeholders handhold during the collaboration process, although these guarantees are not sufficient for a significant increase in the innovation performances. Thus, stakeholders with open innovation experiences might ensure better cooperation in the B2B project environment, but the effects on the final results are unknown. In the same way is the not significant moderating influence of the market orientation also inconsistent with the scientific literature. This may be caused due to the too much customer led focus of this orientation. Thereby will the innovation performance component customer service quality, definitely increase. However, the results of the other components namely product/ service innovativeness, new product/ service success and financial performance might be underexposed by this strategic orientation. In order to investigate this, is it necessary to change the context of this research, and check if market orientation significantly increases the customer service quality. As mentioned before is the resource orientation too much internally focused to contribute to the open innovation activities, this is in partially agreement with the scientific literature. Only when a company develop radical innovations or IP and share this with other stakeholders might this orientation contribute to the innovation performances. This explains why there exists almost no literature about the positive influence of resource orientation on innovation performances. Similarly, even intensive diffusion of technological knowledge has no significant positive influence on the innovation performance, which is not in accordance with the scientific literature. Literature claims that diffusion of technological knowledge always leads to a reduction of the communication gap between businesses and thereby an increase in customer value. However, it might be that a too small technological communication gap between the focal company and stakeholders, in some circumstances has a negative influence on the innovation performances. The literature assumes in every case, before the diffusion of technological knowledge actually starts, a large communication gap, but in some circumstances is the communication gap small and therefore it could have a negative effect to diffuse in this situation more technological knowledge. So there is more information, about the communication gap between the stakeholders, needed to test with different scenarios the usefulness of diffusion of technological knowledge.

### **7.3. Discussion of the managerial implications**

As stated above this study contributes to the literature. From these theoretical conclusions of this study and the qualitative interviews, also some managerial implications considering the context of this research can be derived. Several recommendations will be given to project managers in the B2B environment, which should take into account when looking for opportunities to increase their innovation performances. In chapter 6 is already, due to a focus group meeting with professionals, an overall conceptual management tool developed. This tool can managers, in a B2B project environment with the focus on open innovation activities, use as guideline. This chapter will give more specific managerial implications, which can be used independently of each other. First, the positive effects of open innovation on multiple innovation performances supports managers who intend to further open up their company's business model. These open business models are essential for converting ideas and technologies into economic- and customer value. Moreover, due to the company's open business model can managers be more effective and efficient. Second, the open innovation activities might give managers handhold to continue projects with little profit and low expectations. Because via the open innovation activities might gain these projects unexpected positive results, which will never, be achieved via the traditional way of carrying out a project. According to the professionals in the work field, there is still a lack of Central Information System (CIS) or engagement platforms, which create information sharing and transparency between the stakeholders in a project. This CIS ensures that stakeholders know from each other what the other parties have to offer and therefore rather use this information instead of trying to find the solutions by themselves. By showing the positive effects of open innovation may there is less resistance to the formation and use of a CIS. Fourth, the different modes off open innovation activities are all important to improve the performances, although it seems to be that IP in and out licensing, contracted R&D services, co-creation, networking, and selling market ready products provide the most value at this stage of open innovation activities. The other modes are more radical such as creating spin-offs, the results of this study are not significant enough to ensure the positive impact of all open innovation activities on the innovation performances. That is why managers should start with the more common modes off open innovation activities. Fifth, the finding of the positive moderating effect of the entrepreneurial orientation, highlights ones more the importance of having a clear strategic orientation. This underscores the importance of harmonizing various management tactics and creating a governance to open innovation activities, as performances is the result of the whole combination of approaches and not so much of a single managerial act. Sixth, it is important for the manager to focus on the experiences of the stakeholders in the open innovation activities to create the most value (Ramaswamy & Gouillart, 2010). However, this study not significant

demonstrates the importance of open innovation experience is it according to previous studies e.g. Eidam et al. (2014) useful in order to make use of predefined common language and analytical structure. Managers should involve experienced stakeholders, which are aware of these protocols. Finally, the diffusion of technological knowledge has no significant positive influence, there it mainly depends on the kind of project if managers should diffuse much technological knowledge to stakeholders. Through experience with diffusion of technological knowledge might managers know in the future, which projects may benefit from the diffusion of technological knowledge. This and other subject for further research will be described in the next paragraph. In addition, there are some specific recommendations for the collaboration of Engie Services BA with internal business customers. These recommendations can be found in appendix V. These interviews are conducted together with the semi-structured interviews of Appendix IV.

#### **7.4. Limitations of this study and opportunities for future research**

To this research are, as to every research, limitations and it opens opportunities for future research. First of all, the sample of only 56 usable respondents is rather limited in size. However, there are no previous studies available, which focus on open innovation in the B2B project environment, to compare the number of respondents. Nevertheless, future research in B2B open innovation should aim for larger sample sizes such that more extensive and accurate analysis can be performed. As mentioned before in this research, a negative effect of the small sample size is that it is almost impossible to investigate for different types and sizes of companies if there are significant changes in the results. Future studies should focus on only a few types and sizes of business, or gather a plurality of respondents to check the influence of type and size on the innovation performances. Furthermore, in the future should suppliers and external consultants such as university also be involved in the research. In addition, the respondents off the questionnaires have not always the same function in a business e.g. all respondents are senior project engineer. As a result, this may lead to more uniform responses. However, it is almost impossible to find respondents with exactly the same work tasks and responsibilities.

Another limitation of this research is that the inbound and outbound open innovation activities are not tested separately. Future research should thus focus more specific on the different modes of open innovation and investigate which modes delivers the most value. The presumption is that the more subdued open innovation activities deliver in the beginning the most value, though this is an assumption and needs further investigation, especially for the B2B environment (Dahlander & Gann, 2010). In the same way, the four performances indicators are due to the limited sample size also tested together. It could be interesting for future research which performance indicator will be

influenced the most by the open innovation activities and which one is almost not influenced. In contrast, the moderators, which are used in this research, are tested separately. A recommendation for future research is to test the moderators simultaneous, although this makes the conceptual model more complex and probably no credible representation of the reality. However, it is certainly possible to test at least two moderators simultaneously. Besides, there are many other moderators that might have an influence on the direct relationship of open innovation activities on innovation performances for example; the level of R&D activities within businesses, the number of stakeholders, the influence of marketing activities, the use of end-users in the B2B open innovation activities and the willingness of employees to change. All of these moderators might be interesting for future research, it depends on the research setting which moderators are appropriate. Moreover, the questionnaire has some limitations, one of them is the descriptions of the different strategic orientations. For future research it will be better to test, the different dimensions of the several strategic orientations instead of describe them and ask the respondents witch description match with their strategic orientation. As a result, there is now no clear correlation between the questions about the same strategic orientation. However, this question about the dimensions extends again the length of the questionnaire and a negative side effect could be less respondents. Future research can, based on general open innovation measures, develop measures that are more refined for each of the open innovation activities to further enrich the understanding of open innovation effectiveness. In addition, some case studies need to be done to test in which specific circumstances diffusion of technological knowledge contributes to the innovation performances. On the other hand, the negative influences of open innovation activities on innovation performances in the B2B project environment are also a topic with little attention in scientific literature and in this research study. For future research, it could be interesting to research the negative effects of role conflicts-, opportunism on value- and exertion of power on value in open innovation activities. These effects might influence open innovation activities negatively in B2B co-creation but it is not proven in scientific literature that these effects influence all the open innovation activities negatively in a B2B project environment (Chowhury et al., 2016).

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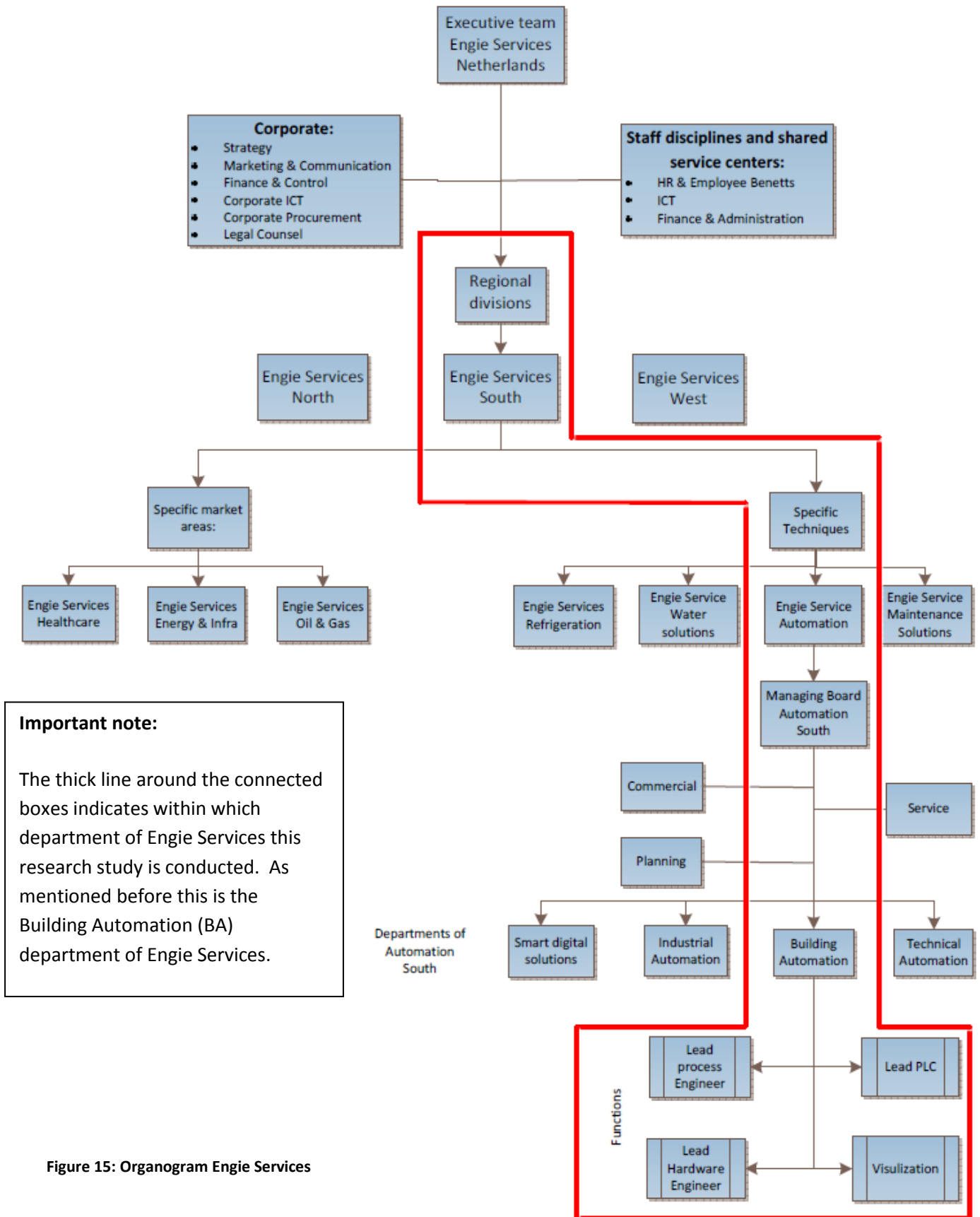
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## Appendix I: Organigram Engie Services



### Important note:

The thick line around the connected boxes indicates within which department of Engie Services this research study is conducted. As mentioned before this is the Building Automation (BA) department of Engie Services.

Figure 15: Organigram Engie Services

## Appendix II: Informal Interviews

Tijdens dit informele interview, met als doel om de hypothese te vormen, leg ik aan u eerst uit hoe het conceptuele model precies in elkaar zit en wat de verschillende variabelen betekenen. Daarna ga ik u vragen waarom en op welke manier de verschillende variabelen volgens u invloed hebben op de innovatie performances. Het is hierbij de bedoeling dat we bij een bepaald antwoord steeds verder doorredeneren en daarbij tot een duidelijk argument komen.

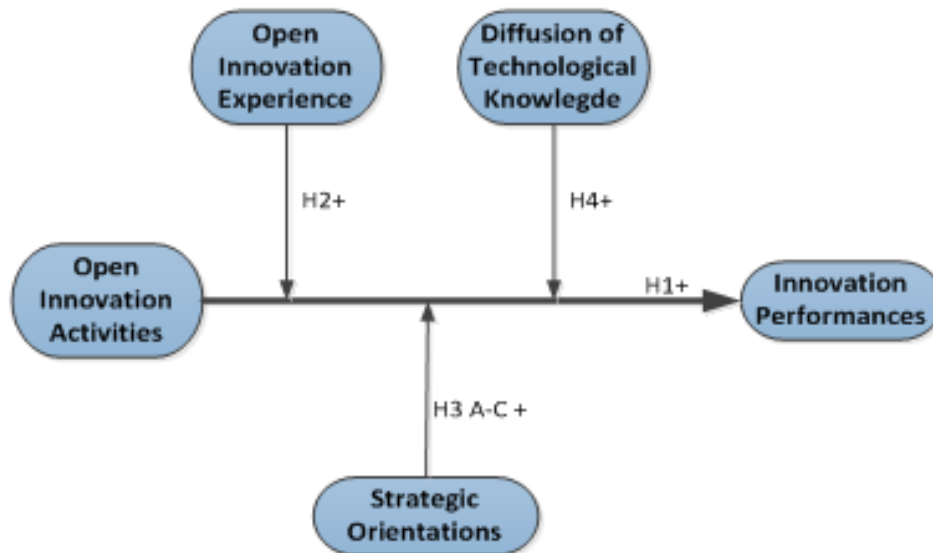


Figure 16: Conceptual model

### Enkele voorbeeld vragen:

- Doet u zelf veel aan OI activiteiten? Hoe verloopt dit proces binnen het bedrijf? Wat zijn de voor en nadelen? Zou u een advies kunnen geven hoe deze activiteiten moeten plaats vinden? Heeft het volgens u invloed op de resultaten of alleen op de klanttevredenheid? Is het een oplossing voor meer innovaties binnen projectmatig werken?
- Hebben stakeholders met veel OI ervaringen volgens u een positieve bijdrage aan het OI proces en daarmee ook op de performances? Op welke manier dan wel? Welke performances verbeteren? Waar blijkt dit uit?
- Bent u als bedrijf er voorstander van om veel kennis te delen met klanten en andere stakeholders? Wat zijn u ervaringen hiermee? Kunt u wat meer vertellen over hoe dit in zijn werk gaat? Heeft dit invloed gehad op de performances? Voor de user of voornamelijk voor de end-users?
- Bent u bekend met de verschillende strategische oriëntaties en waarom zou een bepaalde oriëntatie meer waarde leveren dan een andere en op welke manier? Hebben deze oriëntaties volgens u eigenlijk wel invloed op de performances? Of alleen op het proces?

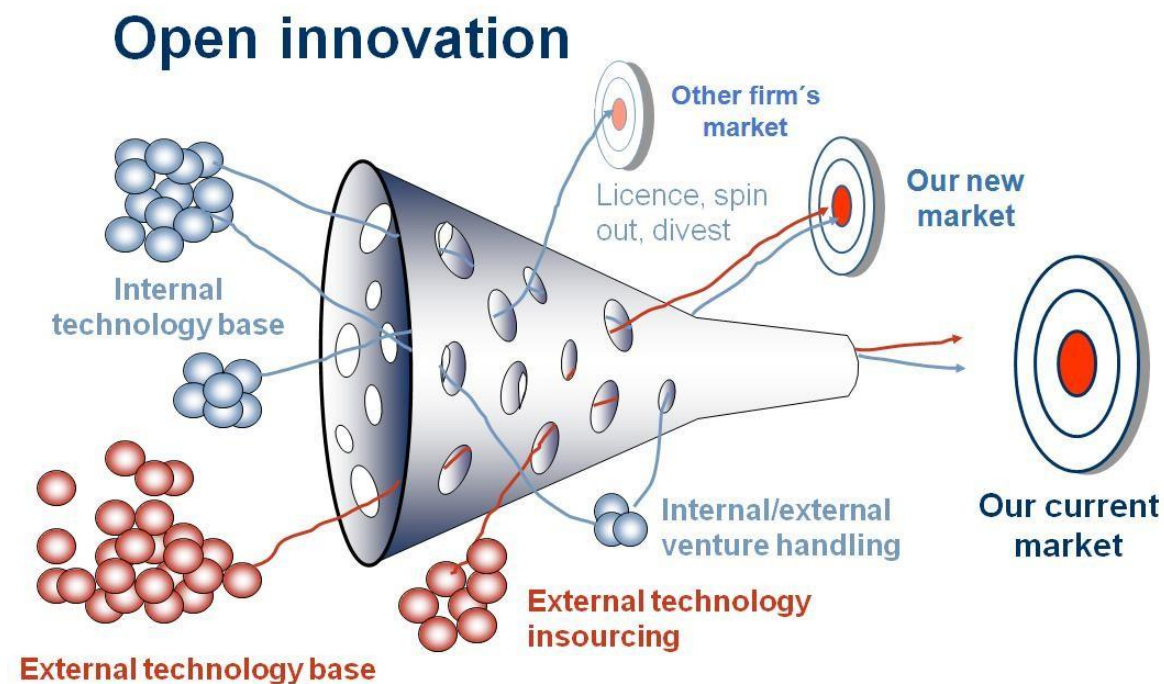
## *Appendix III: The Questionnaire for business customers of Engie Services.*

### **De samenwerking tussen Engie en externe klanten.**

Ik ben Koen van Dael, master student Innovation Management aan de Technische Universiteit Eindhoven. Momenteel doe ik voor mijn afstudeer-scriptie een onderzoek naar Open Innovatie. Met het invullen van deze vragenlijst, helpt u mij met het onderzoek en daar ben ik u zeer dankbaar voor. *\*Vereist*

#### **Open Innovatie**

Open innovatie is tot stand gekomen omdat bedrijven er voordeel uithalen om innovatieve ideeën met stakeholders te delen. Het is tevens het aantrekken van externe kennis, omdat niet alle innovatieve mensen binnen het eigen bedrijf werken. Daarnaast kan externe R&D nieuwe inzichten opleveren voor de eigen R&D afdeling. Dus je zou kunnen zeggen: open innovatie is het intensief samenwerken met stakeholders waarbij kennis wordt aangetrokken



*Stolen with pride from Prof Henry Chesbrough UC Berkeley, Open Innovation: Renewing Growth from Industrial R&D, 10th Annual Innovation Convergence, Minneapolis Sept 27, 2004*

1. Bij welk soort bedrijf bent u werkzaam? \*

Markeer slechts één ovaal.

- Energie productie
- Datacenter
- Vrije tijd / Horeca
- Overheidsinstanties
- ICT & Telecom
- Logistiek
- Maak industrie (High Tech)
- Maak industrie (Low Tech)
- Infra
- (Petro) Chemie Voeding
- & Agricultuur
- Diervoeding (Feed)
- Banken & Verzekeraar
- Afvalverwerking
- Bio./Farm. Industrie
- Maritiem/Scheepsbouw
- Olie & Gas (up, mid)
- Papier
- Bouw
- Facility Services
- Vastgoed
- Hulpverlening
- Water
- Overige

2. Heeft u overig aangeklikt? geef dan een korte omschrijving.

-----

3. Wat is de grootte van uw bedrijf? \*

Vink alle toepasselijke opties aan.

- 1-10 medewerkers
- 10-50 medewerkers
- 50- 500 medewerkers
- 500-2000 medewerkers
- Meer dan 2000 medewerkers

4. Heeft uw bedrijf veel ervaring met Open Innovatie en Co-creatie? \*

Co-Creation is een vorm van samenwerking, waarbij alle stakeholders invloed hebben op het proces en het resultaat van dit proces, zoals een advies, service, plan, of product.  
Markeer slechts één ovaal.

Veel te weinig ervaring      1      2      3      4      5      6      7      Heel veel ervaring

5. Wordt Open Innovatie binnen uw bedrijf gestimuleerd? \*

Markeer slechts één ovaal.

Veel te weinig gestimuleerd      1      2      3      4      5      6      7      Heel veel gestimuleerd

6. In hoeverre is er een gestructureerde Open Innovatie strategie aanwezig binnen uw bedrijf? \*

Markeer slechts één ovaal.

Totaal geen structuur      1      2      3      4      5      6      7      Volledig gestructureerd

7. Is er sprake van het Not Invented here Syndrome binnen uw bedrijf? \*

Het Not Invented here Syndrome betekent dat alles wat door uw bedrijf zelf ontworpen wordt goed is, en dat alles wat door externe partijen wordt aangedragen zeer kritisch beoordeeld wordt en vrijwel altijd van mindere kwaliteit is volgens uw bedrijf.  
Markeer slechts één ovaal.

Sterk aanwezig      1      2      3      4      5      6      7      Helemaal niet aanwezig

### **De samenwerking met Engie Services**

De onderstaande vragen gaan over de samenwerking, op welke manier dan ook, waarbij de waarde voor beide bedrijven zou moeten toenemen..

8. Hoe tevreden bent u over de samenwerking met Engie? \*

Markeer slechts één ovaal.

Geheel ontevreden      1      2      3      4      5      6      7      Zeer tevreden

9. In hoeverre heeft Engie, uw aanbevelingen en nieuwe inzichten verschaft om uw gebouw te verbeteren? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Veel te weinig inzichten verschaft	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heel veel inzichten verschaft

10. Heeft Engie de behoefte (needs) en verwachtingen van uw bedrijf goed begrepen? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Helemaal niet begrepen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Volledig begrepen

11. Bent u door Co-Creation met Engie tot oplossingen gekomen? \*

Co-Creation is een vorm van samenwerking, waarbij alle stakeholders invloed hebben op het proces en het resultaat van dit proces, zoals een advies, service, plan, of product.

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Geen input geleverd of gevraagd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Gehele proces betrokken geweest bij ontwikkeling

12. Wat was de mate van samenwerking? \*

Als uw bedrijf geen behoefte had om intensief samen te werken, kunt u deze vraag overslaan.

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Veel te weinig samenwerking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heel veel samenwerking

13. Zijn de ideeën, nieuwe inzichten of aanbevelingen die uw bedrijf heeft gedaan, ook daadwerkelijk door Engie toegepast? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Geheel niet toegepast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Volledig toegepast

14. Zijn er externe partijen betrokken geweest bij het overleg / ontwikkelproces zoals; leveranciers, ingenieursbureaus, distributeurs etc.?

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Vrijwel nooit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Altijd



15. Moet de verantwoordelijke persoon van Engie, meer open staan voor Open Innovatie en zich hier meer in verdiepen? \*
- Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Volledig intern georiënteerd, dus veel meer verdiepen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Hele werkwijze gericht op Open Innovatie

16. In welke mate heeft Engie kennis / producten aan uw bedrijf overgedragen met de mogelijkheid om deze zelf verder te kunnen ontwikkelen? \*
- Dit kan bijvoorbeeld een ~~een~~ eerste toepassing van een (half) product of proces zijn, dat door het bedrijf verbeterd of op een andere manier toegepast kan worden om uw prestaties te verbeteren. (Kan zijn dat deze vraag niet van toepassing is voor uw bedrijf)
- Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Veel te weinig overgedragen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heel veel overgedragen

### **Strategische oriëntatie van het bedrijf**

Tijdens mijn onderzoek hou ik rekening met 3 soorten strategische oriëntaties die uw bedrijf kan nastreven namelijk: de ondernemers oriëntatie, de markt oriëntatie en de technische oriëntatie. Ik zou graag willen weten welke van de 3 strategische oriëntaties het meeste overeenkomt met die van uw bedrijf. Eerst beschrijf ik deze en daarna kunt u invullen welke van de oriëntaties ten opzichten van elkaar het best bij uw bedrijf past.

#### De ondernemers oriëntatie (Market push)

De ondernemers oriëntatie heeft als doel om voor het bedrijf nieuwe marktkansen te creëren. Het bedrijf is pro-actief ten aanzien van: risico tolerantie, openheid voor innovatieve ideeën en actief ondersteunen van het innovatie proces. Daarnaast scant het bedrijf voortdurend de omgeving op zoek naar nieuwe kansen en nieuwe informatie, ook buiten de bestaande eigen markten en omgevingen. Market push, nieuwe producten/diensten ontwikkelen en daarna hiervoor een markt zoeken.

#### De markt oriëntatie (Market Pull)

Het belangrijkste doel van de markt oriëntatie is het creëren en het onderhouden van een superieure klantwaarde. De klant is het belangrijkste in het bedrijfsproces en deze moet tevreden gehouden worden. Daarnaast heeft een bedrijf met de markt oriëntatie aandacht voor de omgeving dit kunnen zijn: concurrentie, leveranciers en overige stakeholders. Market Pull betekend klantvraag gestuurd.

#### De technische oriëntatie (Product Leadership / Quality)

De technische (resources) oriëntatie streeft erna om een product te ontwikkelen met een zo hoog mogelijke kwaliteit. Het bedrijf heeft unieke technische eigenschappen die bijdrage aan de kwaliteit van de producten. Tevens hanteren de meeste bedrijven een technology push strategie, waarbij ze met producten op de markt komen zonder dat hiervoor een specifieke markt vraag is. Het bedrijf doet interne investeringen om betere financiële resultaten te behalen.



17. Streeft uw bedrijf naar een ondernemers oriëntatie of naar een markt oriëntatie? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Volledige Ondernemers Oriëntatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Volledige Markt Oriëntatie

18. Streeft uw bedrijf naar een technische oriëntatie of naar een ondernemers oriëntatie? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Volledige Technische Oriëntatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Volledige Ondernemers Oriëntatie

19. Streeft uw bedrijf naar een markt oriëntatie of naar een technische oriëntatie? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Volledige Markt Oriëntatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Volledige Technische Oriëntatie

### ***De verspreiding van technische kennis naar klanten***

Tegenwoordig is verspreiding van technologische kennis onder klanten belangrijk vanwege de complexiteit in de technologie. Deze verspreiding van kennis draagt bij aan het verkleinen van de communicatie kloof tussen Engie en uw bedrijf. Graag zou ik met onderstaande vragen willen weten of er een grote communicatie kloof is tussen uw bedrijf en Engie en in hoeverre Engie kennis verspreid en of dit volgens u positief bijdraagt aan het innovatie proces.

20. Heeft uw bedrijf inhoudelijke kennis, van de functionele (wat- vraag) oplossingen die Engie voorstelt? \*

De wat - vraag is; wat moet er precies in het gebouw komen, heeft uw bedrijf daar kennis van of laat u dit volledig invullen door Engie?

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Veel te weinig kennis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heel veel kennis

21. Heeft uw bedrijf inhoudelijke kennis, van de technische (hoe - vraag) oplossingen die Engie voorstelt? \*

De hoe - vraag is; hoe moeten de functionele oplossingen technische met elkaar in contact staan om het gebouw volledig automatische te laten werken. Heeft u hier enige kennis van of laat u dit volledig invullen door Engie?

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Veel te weinig kennis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heel veel kennis

22. Deelt Engie technische kennis met uw bedrijf over de producten of oplossingen die Engie voordraagt? \*

Markeer slechts één ovaal.

Deelt veel te weinig kennis      1    2    3    4    5    6    7      Deelt heel veel kennis

23. Hoe groot is de technische communicatie kloof tussen uw bedrijf en Engie bij aanvang van het project? \*

Markeer slechts één ovaal.

Gigantisch      1    2    3    4    5    6    7      Vrijwel nihil

24. Hoe groot is de technische communicatie kloof tussen uw bedrijf en Engie na afloop van het project? \*

Markeer slechts één ovaal.

Gigantisch      1    2    3    4    5    6    7      Vrijwel nihil

25. In welke mate bent u het eens met de volgende stelling : "Een grote technologische communicatie kloof, leidt tot een focus op prijsvriendelijke producten (lees laagste prijs)"? \*

Markeer slechts één ovaal.

Helemaal mee oneens      1    2    3    4    5    6    7      Sterk mee eens

### ***De innovatie prestaties***

Er zijn verschillende indicators om het succes van innovaties te meten, en hiermee het verband met open innovatie aan te tonen. Uw mening over de innovatie prestaties van Engie, nadat u gebruik hebt gemaakt van het product of de service, zal in de volgende vragen behandeld worden.

26. Hebben het product / de service van Engie volgens u een relatief voordeel ten opzichte van de concurrenten? \*

Markeer slechts één ovaal.

Absoluut Nadeel      1    2    3    4    5    6    7      Absoluut voordeel

27. Heeft de keuze voor Engie een positieve of negatieve invloed gehad op uw imago? \*

Markeer slechts één ovaal.

Geheel negatieve invloed      1    2    3    4    5    6    7      Geheel positieve invloed

28. Is de manier van werken van uw bedrijf veranderd door het product / de service van Engie? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Totaal veranderd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Geheel onveranderd

29. Beoordeeld u het product / de service van Engie als innovatief in vergelijking met concurrenten? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Totaal niet innovatief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Gigantische innovatief

30. Zo ja, zou u een of meerdere voorbeelden kunnen geven waarom u het product / de service van Engie innovatief vindt?

31. Vind u het product / de service van Engie gericht op technologische differentiatie of is het gericht op prijs? \*

Technologische differentiatie is het uitzonderlijk willen zijn door het aanbieden van nieuwe producten of services, waarbij de prijs van ondergeschikt belang is.

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Uitsluitend op prijs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Uitsluitend op technologische differentiatie

32. Heeft de actuele waarde van het product / service van Engie voldaan aan u verwachting? \*

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Veel te weinig voldaan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Voldoet volkomen

33. Heeft de samenwerking met Engie u loyaal gemaakt aan het bedrijf? \*

Ben u van plan meerdere keren samen te werken met Engie, en Engie aan te bevelen aan andere personen?

Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Totaal niet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Erg loyaal

34. Hebben de volgens Engie innovatie oplossingen, ook echt een meerwaarde voor uw dienstverlening naar uw klanten? \*
- Markeer slechts één ovaal.

	1	2	3	4	5	6	7	
Veel te weinig meerwaarde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Heel veel meerwaarde

## *Appendix IV: Semi-structured interviews with professionals of Engie Services*

De semi gestructureerde interviews met professionals van verschillende Engie Service afdelingen worden, waar mogelijk, gebruikt om de resultaten uit de questionnaire te onderbouwen. Tevens verschaffen deze interviews mogelijk inzicht in het ontwikkelen van een conceptuele management tool en extra informatie voor het conclusion and discussion hoofdstuk. Daarnaast wordt gevraagd welke onderwerpen de personen interessant lijken om verder te onderzoeken.

*Deze interviews zijn gecombineerd met de interviews in Appendix V. Waarbij de problemen in de samenwerking tussen Engie Service BA Oisterwijk en andere Engie Services vestigingen is onderzocht.*

De vragen hoeven niet bij elk interview allemaal behandeld te worden, daarnaast wordt er grondig doorgevraagd als een persoon een interessant antwoord geeft op een vraag.

1. Geef ten eerste eens u mening over open innovatie in het algemeen
2. Hoe verloopt een project precies en op welke manier kan hier invloed op uitgeoefend worden?
3. Zijn er tools die het project proces zouden kunnen verbeteren en waarom?
4. Moet dit tot een andere kijk op projecten leiden volgens u? En op welke manier?
5. Vertel eens hoe een gestructureerd open innovatie plan binnen jullie organisatie eruit ziet?
6. Worden open innovatie activiteiten gestimuleerd binnen u afdeling?
7. Op welke manier helpt dit plan daadwerkelijk bij de open innovatie activiteiten?
8. Hoe draagt dit bij aan het verbeteren van de innovatie performances?
9. Op welke manier verlopen de OI activiteiten als er meer stakeholders met ervaring bij betrokken zijn?
10. Kun jij aangeven waarom dit volgens u wel of niet bijdraagt aan het verbeteren van de prestaties?
11. Welke open innovatie activiteiten worden binnen u organisatie allemaal gedaan?
12. Welke dragen volgens u het meeste bij aan de performances?
13. Wat zijn volgens u de voor en nadelen van het gelijktijdig uitvoeren van zowel inbound als outbound open innovatie activiteiten?
14. Denkt u dat inbound of outbound meer bijdraagt aan de performances en waarom?
15. Ziet u in het algemeen open innovatie activiteiten meer als een last of als een zegen en leg uit waarom?
16. Welke van de performance indicators is voor u het meest van belang en waarom?
17. Wordt deze ook het meest positief beïnvloed volgens u door open innovatie activiteiten?
18. Hoe staat u zelf tegenover diffusion of technological knowlegde?
19. Op welke manier draagt dit bij aan het bevorderen van de performances?
20. Indien dit niet bijdraagt wat zijn de nadelen van diffusion of technological knowlegde?
21. Is een grote technologische kennis kloof tussen u en uw klanten een belemmering voor het samen werkingsproces en de open innovatie activiteiten?
22. Zou u zelf juist wel of geen diffusion of technological knowlegde toepassen als u dit mocht bepalen en waarom?
23. Er zijn verschillende strategisch oriëntaties? Welke is toepasbaar op uw afdeling?

24. Kunt u zeggen welke volgens u ervaringen de meeste positieve invloed heeft op de performances en welke de minste?
25. Denk u dat een duidelijke strategisch oriëntatie echt bijdraagt aan het verbeteren van de innovatie performances en op welke manier?
26. Als u de keuze heeft welke management tool ik voor de open innovatie activiteiten zou ontwikkelen wat voor soort tool zou volgens u dan bruikbaar zijn en waarom?
27. Heeft u ook voorbeeld hiervan beschikbaar?
28. Tevens zou ik u willen vragen welke onderwerpen van open innovatie u graag onderzocht ziet worden in een vervolg onderzoek en waarom die volgens u belangrijk zijn?
29. Geef u mening over BA Oisterwijk en noem alle voornamelijk negatieve zaken die spelen tijdens de samenwerking.
30. We gaan nu dieper in op alle negatieve zaken.

## *Appendix V: The negative experiences of collaboration with Engie Services*

In deze bijlage worden de grootste problemen die projectleiders van andere Engie Services vestigingen ervaren bij de samenwerking met Engie Services Building Automation (BA) Oisterwijk opgesomd. Dit vraaggesprek vond gelijktijdig plaats met het interview in Appendix IV, de enigste vraag die tijdens dit interview werd gesteld is geef u mening over BA Oisterwijk en hier is telkens op doorgevraagd. Voor deze problemen wordt ook een mogelijke oplossing voorgedragen. Natuurlijk zijn er ook zaken waarover ze (zeer) tevreden zijn, echter dit onderzoek focust zich met name op de negatieve ervaringen, met als doel om dit te verbeteren. De problemen zijn hieronder weergegeven:

1. BA Oisterwijk heeft een specifiek stappenplan dat altijd doorlopen moet worden, hierdoor is de organisatie niet erg flexibel en neemt het ook meer tijd in beslag voordat ze overgaan tot actie in vergelijking met concurrenten. Tevens wordt het afstemmen van de plannings op elkaar hierdoor vermoeilijkt.
2. De verwachtingen en needs van de interne klanten worden niet altijd goed begrepen. Met het negatieve gevolg dat de mate van samenwerking daardoor verminderd.
3. Externe meet en regel partijen hebben meestal iets meer tijd en ze weten meteen op de werkplek zelf wat ze moeten doen. Dit is ook een gevolg van het probleem 1.
4. Kleinschalige projecten is niet de specialiteit van BA en hier zijn ze ook minder in geïnteresseerd.
5. De prijs van BA Oisterwijk is hoger dan van de meeste concurrenten dit komt door het hoge uurloon van de engineers, die meestal al jarenlang werkzaam zijn binnen Engie Services. Echter door de totaal oplossing die Engie Services aanbieden hebben ze wel degelijk een voordeel t.o.v. concurrenten.
6. De producten en service van BA zijn niet erg innovatief in vergelijking met de concurrentie.
7. De houding van BA is te formeel en soms zelfs arrogant en ze zouden meer betrokkenheid moeten tonen naar de interne klanten toe. De interne klant moet dezelfde behandeling krijgen dan een externe klant en dit gebeurt momenteel te weinig.
8. BA kan sommige werken niet aannemen omdat ze hiervoor hardware cursussen van leveranciers zoals Siemens moeten volgen. Dit wordt echter niet altijd gedaan en daardoor moet het project uitgevoerd worden met een extern automation bedrijf.
9. De werknemers van BA zijn te veel op zichzelf gericht als technici achter een pc in plaats van dat ze een haal en breng plicht hebben en zaken toelichten, aanbevelingen geven of de discussie aangaan. Ze doen te veel een verplicht nummer en drive en verantwoordelijkheid is vaak ver te zoeken.
10. Een aantal jaar geleden had elke projectleider zijn eigen team van engineers, dat werkte beter dan tegenwoordig omdat nu personeel moet worden aangevraagd voor een bepaald project. Hierdoor wordt het bedrijf log en kunnen ze niet snel inspringen op problemen, de wachttijd groeit.

11. De werknemers zijn soms bang om advies te geven omdat ze daardoor denken ergens verantwoordelijk voor te zijn. Echter ligt de verantwoordelijkheid bij de projectleider die vraagt namelijk om advies en gebruikt dit.
12. Er heerst een bepaalde cultuur binnen BA die leidt tot het Not Invented Here syndrome (NIHS). Dit leidt tot het probleem dat kansen over het hoofd worden gezien.
13. De business unit BA mist de aansluiting in de markt met de vrije producten, dit komt omdat ze informatie niet delen met klanten en deze weten daardoor soms niet wat BA allemaal te bieden heeft.
14. Door te weinig kennisdeling is de afdeling niet innovatief genoeg, laatste jaren blijkt ook dat de Scada engineers innovatiever zijn dan de PLC en proces engineers.
15. BA mist in sommige gevallen trends omdat ze producten niet verder ontwikkelen, als ze goed idee hebben ontwikkeld blijft dit na 1 project liggen en wordt niet verder gebruikt.
16. BA ontzorgt de interne klant veel te weinig, ze zouden ondersteuning moeten bieden maar het samenwerken met BA levert juist risico's op. Ze doen namelijk minder moeite voor deadlines en afspraken.
17. BA haalt geen projecten op binnen de organisatie, ze wachten tot er om advies wordt gevraagd. Ze zijn gedeeltelijk in zichzelf en dit leidt tot wrijving binnen de organisatie.
18. Het inhuren van een BA Oisterwijk engineer vanuit een andere Engie Service afdeling verloopt niet soepel doordat de begeleiding en kennisoverdracht op dit gebied matig is. De externe projectleider weet namelijk niet precies wat hij moet calculeren voor de kosten en het werk van de engineer van BA Oisterwijk.
19. Soms is de afstand tussen verschillende afdelingen van Engie Services eigenlijk te groot om bij elkaar over de vloer te komen en dus is de kennisoverdracht te beperkt. Dus hier moet goed naar gekeken worden.

Voor al deze problemen worden een aantal oplossingen voorgedragen die er voor moeten zorgen dat de samenwerking tussen BA Oisterwijk en interne klanten van Engie Services beter gaat verlopen, veel oplossingen kunnen worden gezocht in het nastreven van open innovatie principes:

1. De organisatie zou flexibeler moeten zijn, dus ervoor zorgen dat niet altijd het gehele stappenplan doorlopen hoeft te worden. Ze kunnen voor kleinschalige projecten ook beginnen bij de laatste stap en van hier uit terug werken. Hierdoor zullen ze sneller te werk kunnen gaan en dit zorgt ervoor dat het proces beter zal verlopen.
2. Veel meer kennis delen met interne klanten, vaak begrijpen ze elkaar slecht en daardoor kunnen ze niet op hetzelfde "niveau" met elkaar praten en samen tot oplossingen komen.
3. BA Oisterwijk moet meer de market push strategie nastreven, ze wachten momenteel echt op werk terwijl ze hier ook achteraan kunnen gaan en interesse tonen bij andere afdelingen wat er speelt in de markt. Dus de oriëntatie van de afdelingen moet meer van de market push principes bevatten, natuurlijk blijft de belangrijkste drijfveer de market pull, maar het verschil in intensiviteit moet zeker verkleind worden.
4. Het positieve gevolg van de market push oriëntatie is dat het gevoel van betrokkenheid en verantwoordelijkheid wordt vergroot bij de interne klant, hierdoor beleefd deze dat ook als het ontzorgen van de klant.



5. De samenwerking van BA met interne klanten moet op precies dezelfde manier verlopen als met externe klanten, of in ieder geval zo worden beleefd door de interne klant. Dus met dezelfde contracten, financiële regels en dezelfde intensiteit van contact.
6. Het uurloon van de engineers is te hoog, om de kosten te verlagen zullen deze engineers effectiever en efficiënter moeten werken. Tevens moet het verloop binnen de organisatie toenemen. Hierdoor dalen de personeelskosten ook trek je hopelijk personeel aan dat meer betrokkenheid toont naar interne klanten en een nieuwe mindset heeft.
7. Sommige onderdelen van Engie Services zijn veel te duur in vergelijking met concurrenten, zoals panelenbouw. Er moet over nagedacht worden om te dure takken van het bedrijf af te stoten of een mogelijkheid te vinden om deze goedkoper te maken. Mogelijk door meer samenwerking met de leveranciers van de onderdelen.
8. Om innovatief te zijn moet er meer open innovatie plaats vinden met de andere stakeholders in het project, zoals is aangetoond in het master-thesis onderzoek. Vooral met leveranciers kan de samenwerking intensiever door bijvoorbeeld bepaalde concepten door te ontwikkelen. De samenvoeging van een market push oriëntatie en open innovatie activiteiten moet leiden tot innovatievere oplossingen. Hiermee kan gestart worden in een pilot project of projecten die risicoloos zijn zodat ervaringen opgedaan wordt en hierdoor zal het open innovatie proces steeds beter gaat verlopen.
9. Het inhuren van engineers door andere vestigingen van Engie Services verloopt moeizaam omdat ze in de meeste gevallen elkaar niet kennen en omdat de calculatie van de prijs meestal een probleem is. Dit zou eigenlijk door een projectleider of verantwoordelijke persoon in Oisterwijk gedaan moeten worden zodat deze persoon een eindblad zonder winst meteen door kan sturen naar andere vestigingen waar de projectleider op de betreffende locatie dit opneemt in zijn berekening. Dit moet dus goed op elkaar af worden gestemd maar dat is tot op heden niet het geval, de samenwerking is niet efficiënt en dit kan zeker beter. Dus als er in de toekomst weer gebruikt wordt gemaakt van een projectleider met zijn eigen team van engineers dan kan dit ook beter aangestuurd en begeleid worden.
10. Het personeel moet worden gestimuleerd om meer inzet te tonen en echt voor het bedrijf te gaan, misschien kan dit doormiddel van een beloningsysteem en het basisloon daarom iets aan te passen.