Future Development Strategies

Challenges to adopt Open Innovation Practices

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Abstract

Living in the era of globalization and the Internet, the demand for faster innovation cycles is increasing. Thus companies have the aim to explore new innovation strategies. Therefore the basis of this study is to investigate the development from the traditional way of innovation to Open Innovation practices. If companies want to get a benefit of Open Innovation, many structural and cultural changes have to be overcome. The protection of company secrets and the retention of the core competencies are the most elementary factors, which have to be considered if external stakeholders are involved in the innovation process. In addition to that, the purpose of this is to examine and declare the limitations and challenges of Open Innovation strategies.

Through a multiple case study of three companies, including semi-structured interviews with key individuals, who have extensive experiences in the research and development department, the empirical findings are deducted and connected with the framework. Furthermore the gathered data is analysed on the basis of a research model, which was developed from the existing literature. The research model contains the most common challenges when adopting Open Innovation. These challenges are intellectual property, flexibility, internal structure, trust, acceptance and integration. In the course of this study, different significant manifestations of the respective factors were determined. Moreover it can be identified that some factors are related to each other or have several similarities.

This study shows that the structure and the size of a company is the most crucial challenge by adopting Open Innovation practices in the ongoing innovation process. The challenge of company size is affecting the corporate and process structures. This includes the organization of intellectual property as well as the cooperation with companies of different sizes. The second important challenge is the generic term of trust, which is related to the overall acceptance of the company towards Open Innovation. Moreover, the factor of trust is influencing the level of integration of suppliers and customers in the innovation process. To find the right balance between trusting and supporting the internal innovation department and be open for external knowledge is the key factor for success. Additionally, it can be recommended to implement a central innovation department, which is only responsible for Open Innovation.

Keywords: Innovation, Open Innovation, Closed Innovation, Future Trends, Development Strategies, External Knowledge, Intellectual Property, Core Competencies
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1 Introduction

The main purpose of the first chapter is to introduce the reader into the researched topic and give a first insight about Open Innovation. Subsequently, the problem statement, the purpose and the research question will be presented. Finally, the introduction part will be completed by discussing the study’s delimitations and picturing the thesis outline.

1.1 Background and Significance

The dynamic changes in the company's environment forces firms to improve recently established strategies or to opt for new ways to guarantee the sustainable success of the entrepreneurial activity. In the area of business administration, companies have reached the limits of optimization potential, when striving for minimizing costs respectively to maximizing the output. An observable consequence is the trend of companies to shorten their product-life-cycles. Furthermore, the increasing competition enhances the innovation pressure remarkably. The management of dynamics, complexity, and costs can be considered in this context as a central critical success factor, which an enterprise has to face (Dahlander & Gann, 2010)

Due to aforementioned pressures on companies, there is a demand to explore new innovation strategies. The study therefore aims to investigate the way from traditional innovation strategies to Open Innovation strategies. Furthermore, the study places importance on the identification of recommended methods in order to use Open Innovation processes. With the concept of Open Innovation it is possible to identify the company’s incoming and outgoing knowledge and further enables companies to generate innovations by using internal and external marketing channels (Chesbrough, 2006a; 2006c).

Nowadays, within the concept of modern knowledge generation, the awareness of idea hunting outside the current business units of an organization is getting more and more important. The company’s objective is to own ideas and additionally be able to detect ideas from the respective peripheral side (Zerfaß & Möslein, 2009).

The innovation researcher Chesbrough (2006b) deemed as the copyright holder of this open approach and defines Open innovation in the following way: “Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external pathways to market, as the firms look to advance their technology. Open Innovation combines internal and external ideas into architectures and systems whose requirements are defined by a business model” (p.1).

Open approaches shall thereby complement the traditional and closed way of idea generation in a useful way in order to create new potentials. Thus, this study will
declare crucial factors to implement Open Innovation practices and how the challenges are affecting the entire company (Hartweg, Kaestner, Lohmann, Proff, & Wessels, 2015).

1.2 Problem Discussion

By adopting new innovation processes, many companies are starting to take Open Innovation practices into consideration. To involve external knowledge in the company’s innovation cycle is not a completely novelty. Therefore, this study has the aim to investigate the necessity of Open Innovation and analyze if Open Innovation is only a short-term trend. With the framework this study will examine the current situation as well as the recommendation methods of Open Innovation (Gassmann, Enkel, & Chesbrough, 2010).

Nevertheless, in order to get an economic benefit of Open Innovation, companies have to overcome several structural and cultural changes. Moreover, the involvement of further external sources has to be observed, this contains organizations and individuals like customers and suppliers. In addition to that, an enterprise has to investigate how they want to keep their core competencies and to protect their company’s secrecies if external stakeholders are involved in the innovation process. Thus, there is a demand to investigate and declare the limitations and challenges of Open Innovation strategies.

1.3 Research Purpose and Research Question

The purpose of this study is to explore how current innovation processes are organised and to identify the experiences from Open Innovation practices. In addition, the aim is to examine the necessity to apply Open Innovation processes and therefore investigate and the challenges when adopting Open Innovation.

RQ: What are the challenges when adopting Open Innovation practices in ongoing development processes?

1.4 Delimitations

First of all, the study is delaminated to its sample size consisting of 3 particular cases, thereby involving companies from Sweden and Germany. Furthermore, for each company only one department and respondent was uniquely consulted. In addition to that each case was related to the department of research and development or innovation department. Lastly, no further research experts of this topic were involved and therefore this study is focusing only on the industry sector from these specific three cases.
1.5 Layout of Thesis

Figure 1 illustrates the chapters in a numerical order, namely Introduction, Theoretical Framework, Methodology, Analysis and Conclusion. The chapter of Introduction is starting with a background of this study and is informing the reader about the Problem Discussion, the Research purpose and the study’s Delimitations. Subsequently, the Theoretical Framework is investigating the basis of innovation processes and the approach as well as the development of Open Innovation. The frame of reference is finally summed up by a research model consisting of factors regarding Open Innovation, which is based on the study’s theoretical foundation. The chapter of Methodology includes Research Philosophy, Research Design, Research Purpose, Research Approach, Research Strategy, Research Method as well as the Time Horizon and the Data Analysis. Thereafter the chapter of Empirical Findings is presented to the reader. In this section, the collected data will be described and divided into the sections of About the Company, Innovation processes and company culture Innovation processes with partners, Experiences with Open Innovation as well Challenges of Open Innovation and Innovation in the future. Subsequently, the gathered data will be analyzed and investigated. In the conclusion, the empirical data will be summed up in order to fulfill the study’s purpose and to answer the research question. In general, the conclusion consists of the Outcome of the Research Model, Practical Implications, Limitations as well as the section of Future Research.

Figure 1: Layout of Thesis
2 Theoretical Framework

The aim of this theoretical framework is to provide a deep understanding and detailed insight into the relevant research about the development of Open Innovation and Innovation processes in general. Furthermore, on the basis of this framework a Research Model will be developed.

2.1 Innovation

According to Schumpeter (1934) innovation is not only an invention or a technical innovation. From his point of view the purpose of innovation is the process and organizing innovation with the association of novelty products and methods. This novelty, which implies the demand for noticeability, is getting point out in a dynamic comparison to the common products and procedures. The intention and the methods are getting connected in an unprecedented way and have to be proved successful in a practical application. Innovation in the narrower sense is a first time economical application of an innovative matured idea.

The dimensions of innovations could be divided into process innovation and product innovation. Process innovations are characterized by procedures, which have an improved efficiency, and are acting in an optimized by combining factors like costs, time, security and quality. Product innovations are affecting the market utilization, which is noticeable as novelty for the customer with the main aim to improve. Furthermore product innovations have to establish themselves on the market, whereas the establishment of process innovations can be forced by hierarchical power within the company (Walcher, 2007).

2.2 Innovation in a Broader Sense

Generally it means that a procedural dimension is involved in the innovation process. The phases of the problem solution of an innovation process are divided into temporal segments in a linear phase model (Walcher, 2007).
Throughout different models, different types of criteria are used to describe the phases of the innovation process. The most common phases, which are also illustrated in Figure 1, are 'idea creation', 'idea acceptation' and 'idea implementation' (Corsten, Gössinger, & Schneider, 2006).

The early phase of idea creation, which is characterized by high uncertainty, starts with the idea generation and idea evaluation and includes a first formalized approach in a concept form. The level of coordination in this research phase is only marginally coordinated and is mostly unsystematic. The next phase is the phase of idea acceptation also known as the development activity. The purpose here is to work out a concretization based on the concept. In physical developments the prototype creation gets firstly connected before a successful testing phase of the idea realization is getting implemented. In this testing phase an economical realization through a production and marketing launch of the company is conducted (Pleschak & Sabisch, 1996).

The main points of criticism of the ideal-typical phase model are the mechanistic image and the partly arbitrarily differentiation of the phases. Studies of the innovation process are proving that this process is not linear but rather characterized by recursive loops and fractions in the procedure. But for the purpose of handling the complexity, phase models are providing an adequate framework of approximation (Corsten, Gössinger, & Schneider, 2006).
2.3 Development Process of Innovation

The approaches and the organization of innovation can be very different in their strategy. Therefore a development of innovation processes can be observed. Depending on the level of development, the market position or the technology intensity of an enterprise, also the behavior patterns of companies are varying. In the most cases it is only distinguished between supply orientation 'Technology push' and demand driven 'Market pull' strategies. In fact the approaches and organization forms of innovation are more verified. According to Rothwell (1993) and based on the evaluation of different interpretive approaches. The development of innovation frameworks can be differentiated to five different categories, which can be seen as successive generations. The following five generations should explain the complexity of innovation behavior of companies. Nevertheless it has to be mentioned that nowadays still all five concept are being used in the industry.

- **Technology push**: The basis of innovation activities is the technological potential of companies, which are provided through marketing activities to the customer.

- **Market pull**: The basis of innovation activities is the market demands, which are determined by market research instead of generating their demand potential on their own.

- **Interactive innovations**: Parallel usage of 'Technology push' and 'Market pull' strategies, which are cross-checked and coordinated on each other. Instead of relying only on own potentials companies are aligning their activities with the market signals and develop them further.

- **Integrated innovations**: The purpose is to define problems together with supplier, customers, competitors, research facilities and engineering offices and to develop from these problems tailor-made single solutions.

- **System-integrated Innovations**: The next step of integrated innovations with additional extended strategies, which are providing and ensure a continuous and permanent electronical data communication with supplier, customers, competitors, research facilities and engineering offices. The aim is to develop tailor-made system solutions.
2.4 The Role of technological Innovation for Competitive Advantage

According to Tidd and Bessant (2013) competitive advantage is defined as a certain advantage of an organization or company, which is relevant for the performance towards their competitors. These advantages can include for example technological capabilities, cost control or service aspects. The aim is to achieve a lasting competitive advantage, which could not be reached by the competitors for a longer time. There are many further aspects, which are standing for a competitive advantage that are mostly identical with strategic success factors like an important feature of performance for the customer; the advantage must be perceived by the customer; the advantage must have a certain durability. The role of technological innovation for competitive advantage is nowadays one of the most important factors which organizations or companies have to be aware of considering the constantly changing markets as well as the growing demanding customer behavior. When talking about technological innovation, a new product, service or a new process has to lead a strategic advantage (Schumpeter, 1934).

Another significant aspect for technological innovation is the company’s innovation process. Tidd and Bessant (2013) divide the innovation process in different stages. These include the phases of search, select, implement and capture value. Additionally each organization has to investigate and evaluate their personal method to challenge the innovation process. Example for that is an organization focusing on revolutionary or evolutionary changes. This means they are pioneers with radical changes (revolutionary) or focus more on refine and improve established competences like incremental changes (evolutionary). Gaining a strategic advantage is the reason why organizations are continually innovating. There are many possibilities to obtain a strategic advantage for example a novelty in product or service like the Walkman, the mobile phone or telephone bank. Another strategic advantage is the novelty in process with faster or more customized processes like Internet banking or online bookselling.

2.5 Definition Knowledge

When approaching the term of knowledge in a categorized way it is necessary to deal with the contextual source. These sources of data will be transformed by semantic occupation to information. With the purpose getting a pragmatic network, this information has to be connected usefully in order to create knowledge. Knowledge can be characterized as a complex collection of data. Information in detail is only simple and discrete data. Data is a partial amount of knowledge, which is crucial to initiate and formalize knowledge (Gassmann, 1997).

According to Peterson (2013) data, information and knowledge are defined and differentiated in Figure 3.
2.6 Differentiation of Implicit and Explicit Knowledge

Implicit knowledge is associated with a high connection to the individual and thereby it is also known as individual knowledge. It is based on experiences that have been affected by applications and personal practices as well as by independent analysis of cause-effect-relations. Due to its complexity it is hidden in the individual and acting like a subconsciously knowledge. Thus it detracts of the formal expression and is difficult to inform. An element of implicit knowledge is conceptual knowledge, which defines and understands the reality (Wallin & von Krogh, 2010).

The technical element of implicit knowledge is craftsmanship as well as specific know-how. After this kind of knowledge, which is known as informal, difficult to describe and promote, can be processed articulated and interchange in a problem solution, new knowledge is created. This knowledge is characterized as explicit knowledge or codified knowledge. This form of knowledge is not any more linked to the individual but can be used by a large number of users and possibly internalized. Explicit knowledge has become a cheap and anywhere available factor of production, caused by the storage and distribution opportunities, which are provided by the information and communication technology (Gehle, 2006; Klodt, 2001; Faber, 2009).
2.7 Closed and Open Innovation

On the base of Henry Chesbrough’s research (2003a; 2003b) a paradigm shift in the way companies set their innovation effort is recognizable. In particular, high-technology industries changed from a closed innovation model to more open innovation processes. The following chapters will investigate this change of innovation more in detail and explore what differences and opportunities are (Herzog & Leker, 2010).

2.7.1 From Closed to Open Innovation

The plan of classic innovation processes follows a stage-gate structure and a hopper with a wide front end is a characterization. The idea creation, which starts the process and the invention, is performed on the front end by the research department. The next step is the idea implementation and development stage (Huizingh, 2011).

That is the task of the development department, which includes realizing and encouraging the ideas. On the next phase the tasks is the commercialization, where inventions are getting convert into innovations and launched on the market (Cooper, 1996).

In the vertical integrated innovation process, which is the traditional way, all responsible research and development functions are centralized and solved within the company. The company’s innovation process believes in in-house knowledge and domestic ideas. From the most promising ideas the companies develops new products and launches the products to the market as well as distributes them. In Chesbrough’s view this is the typical way of closed innovation (Chesbrough 2006; Nedon, 2015).

For many years this method to handle the company’s innovation processes was very effective. High incomes and margins were reached through innovation, which were developed in the in-house research and development department. Therefore the company invested more and more in this department. The advantage of this approach was that the company was able to keep and regulate their sophisticated assets emerged from their own innovation process as well as to increase their base of knowledge (Chesbrough & Brunswicker, 2013; Nedon, 2015).

2.7.2 Closed Innovation

In Schumpeter’s (1934) economical stamped view, innovations are created by enterprises and have to be developed in a closed form of innovation generating. Following this interpretation that successful innovations have the demand on piloting
and control, an enterprise is creating, developing and merchandising their own ideas (Chesbrough, 2006a).

Henry W. Chesbrough (2006c) is summarizing Schumpeter’s view of innovation with the term of ‘Closed Innovation’: “This paradigm counsels firms to be strongly self-reliant, because one cannot be sure of the quality, availability, and capability of others’ ideas: If you want something done right, you’ve got to do it yourself” (p.20).

In Figure 4 the clearly defined barriers of companies with closed innovation processes become obvious. Ideas are examined internally and filtered during the research activities. Ideas with promising potential will be extended and introduced to the market. Each company disposes of its own pool of new developed potentials without sharing this base with others.

![Figure 4: The Paradigm of Closed Innovation (Chesbrough, 2006d)](image)

From this point of view the hierarchy, which is the preferred form of this organization, is playing a significant role. Thus the research and development activities within the corporation are guided through internal rules, successful implementation, and providing new findings with property rights (Chesbrough, 2006d).

### 2.7.3 Open Innovation

Chesbrough’s approach of Open Innovation shows that the permanent opening of corporate boundaries for external potentials is necessary to reach the position as innovation leader. The idea of Chesbrough is that knowledge of internal as well external resources is relevant for the success of an enterprise. Chesbrough has taken into consideration that the critical success factors time, costs, and quality are not
self-controllable by an enterprise, due to the fact of increased pressure of competition. The interaction between the participants in a network including the consumers is getting more profitable. With this approach he is succeeding an alternative plan comparing to the traditional vertical integrated model of innovation. In this model the internal division of research and development leads to internal developed products, which are merchandised by the company itself. Open Innovation is following the progression of implication with strategy, process and organisation, while the differentiation at the sector of innovation generation is tracked by vertical integration. The permanent opening has only an opportunity for success if the required resources are available within the environment (Chesbrough, 2003b; 2003c).

*Figure 5* illustrates a 'landscape of knowledge' with the changed exchange of ideas. The obtained ideas are not only moving within the organization, but also between this organisation and external sources of knowledge (Burmeister, Neef, & Linnebach, 2006).

![Figure 5: The Paradigm of Open Innovation (Chesbrough, 2006d)](image)

The disposability and quality of external ideas is overruling the static of corporate boundaries compared to the closed approach. The result is a diffusion of the research project. Therefore it is not necessarily true that successful developments are only driven by the research and development department (Lundström, Wiberg, Hrastinski, Edenius, & Agerfalk, 2014).
2.7.4 Difference between Closed Innovation and Open Innovation

According to Chesbrough and Vanhaverbeke (2006) the differences between Open Innovation and the traditional theories of innovation are presented in the following list.

- External knowledge has the same importance as internal knowledge.
- The involvement of a business model is significant for the cost- and benefit analysis of research and development departments.
- It is possible to recognize misdeterminations in selecting projects by an application of a business model.
- Aware and output-driven outsourcing of knowledge and technology.
- A landscape of knowledge is available in an abundant way.
- The role of the management of intellectual property is examined and emphasized.
- Knowledge mediators are a part of the business environment.
- The innovation capacity and performance is getting assessable by statistics.

Chesbrough consolidates these tendencies on four main focuses being business model, knowledge, landscape of knowledge, management of intellectual property and operationalization. The highest priority for Chesbrough is the focus on enterprise organization, which he terms as 'Business Model'. The Business Model includes the approach to create value by using internal as well as external sources and to capture a piece of that value by using external and internal sources (Chesbrough, 2003b).

2.8 Comparison of the Principles of Closed and Open Innovation

According to Chesbrough (2003c) the principles of closed and Open Innovation are contrasted and summarized in Figure 6. In this case the concepts of closed innovation are focusing on in-house technology and ideas. The company’s research and development department has the purpose to increase and to push these technologies and ideas as well as to advance the further steps to bring it on the market. Comparing to closed innovation, the principles of Open Innovation are not only taking into account in-house research and development. With an additional investigation for technologies and ideas outside the company’s boarders as well as to offer in-house knowledge for external use, a company is on the right track of Open Innovation practices (Chesbrough, 2003a; 2006d).
2.8.1 The Trend of Open Innovation

Open innovation developed from being only interesting for a few researchers to a major research area. Many management and technology journals are taking Open Innovation into consideration as an important factor for future strategies. The following trends, shift of paradigm with the influence of Open Innovation are apparent (Gassmann, Enkel, & Chesbrough, 2010):

- Changing the principle of industry penetration, from pioneers to mainstream. Examples for industries, which are working with the Open Innovation concept: Software, electronics, telecom, pharma and biotech (Chesbrough, 2003b; Gassmann, 2006).

- Paradigm shift in the intensity of research and development from high to low tech. To use the possibilities in different low-tech sectors with the early integration of the user as well as supplier and universities in the innovation process (Lichtenthaler, 2008).

- Small and medium-sized enterprises are following multinational companies with the approach of using the Open Innovation concept. (Gassmann, Enkel, & Chesbrough, 2010)
• Changing the innovation processes from stage gate to probe and learn with the support of early interaction with supplier, customer and research and development partners (Gassmann, Enkel, & Chesbrough, 2010).

• Changing the structure of research and development departments from standalone to alliances with building partnerships and alliances with purpose to create value (Gassmann, Enkel, & Chesbrough, 2010).

• Use and integrate the knowledge of universities and support them with consequently promotion to get a sustainable outcome. Involve talents of the universities in your own project and research teams (Chesbrough, 2004).

• Change of paradigm with involving the service sector in the innovation processes, thus to get new potentials for example in cloud computing services (Gassmann, Enkel, & Chesbrough, 2010).

• Shift in paradigm of intellectual property from protecting them to see them as a tradable good. New possibilities for companies to trade their knowledge to competitors or partners (Gassmann, Enkel, & Chesbrough, 2010).

2.9 The Network Approach

According to Håkansson (1987; 2015) the network approach could be explained like illustrated in Figure 7 (p.18). The three basic elements of a network are actors, resources and activities. The actors are related together to each other they are building a network. The same process is working with the activities and the resources. Moreover these three network elements are linked to each other. The basic elements are interacting together in an entire network.

Furthermore actors in a network approach can be described as a group of persons, a business unit of a company, one or more companies creating a coalition or as well individuals which are performing functions and tasks or guiding resources. All these kinds of actors can be connected to each other at a different administrative level. The aim of those actors is to increase the control of a network with the experiences and expertise each actor has gained in different resources and activities. The result of such a network is based on a high level of cooperation and networking. An example where different actors are working together is for technical development projects. Many network partners like customers, competitors, research institutes or consultants are including their specific kind of expertise and know-how to acting like a focal company. Another basic element of a network approach are activities which
are managed by actors where different resources are combined, evolved or generated by the use of further resources. The two central types of activities are transformation and transaction. To achieve a performed activity cycle, both kind of activities are necessary. Transformation activities are regulated by a specific actor and are assigned to a specific resource which can be enhanced by other resources. These transformation activities are connected to each other in several methods by transaction activities. Many activity cycles are working in a coordinated and connected system to achieve a functioning network with robust, efficient and repetitive interdependencies between actors and activities. These interdependencies are elementary for a common technical development of all relevant actors with the aim to increase transaction activities. The third main category in a network are resources which are divided into transformation and transaction resources and are dependent on each other. Resources are assets which could have a financial, physical or human value. Physical assets are for example machinery or material, human assets are labour, knowledge or relationships and financial assets are having an economic value. The result of the use of specific resources is mutually on the combined activity cycles and therefore potentially different. The most crucial part of resources are knowledge and experience which can develop new expertise by combining them with new knowledge and experiences. An appropriate way to link these 3 main elements of a network together is the basis for a successful proceeding common development process. (Hakansson & Johanson, 1984)

Hakansson & Johanson (1984) are describing particular forces, which are binding these basic elements of a total network together:

- “Functional interdependence: Actors, activities and resources together form a system in which heterogeneous demands are combined with heterogeneous supply. They are thus functionally related to each other” (p.9).

- “Power structure: The actors base their power on the control of activities and resources. Thus, there is a systematic handling of the different components in relation to each other they are organized by conscious hands“ (p.9).

- “Knowledge structure: The designs of the activities as well as the use of the resources are bound together by the knowledge and the experience of previous and earlier actors” (p.9).

- “Time related structure: The network is a product of its history in terms of experience and investments in relationships, knowledge routines and so
Changes of the network must be accepted by the rest of the network (or at least by some part of it). Therefore most of the changes will be marginal and closely related to the past” (p.9).

Figure 7: The Network Model (Hakansson & Johanson, 1984)

2.10 Three Core Process Archetypes of Open Innovation

2.10.1.1 According to Gassmann and Enkel (2004) three core processes of Open Innovation should be supposed:

- The outside-in process: Enriching a company’s own knowledge base through the integration of suppliers, customers, and external knowledge sourcing can increase a company’s innovativeness (p.1).
The inside-out process: The external exploitation of ideas in different markets, selling IP and multiplying technology by channeling ideas to the external environment (p.1).

The coupled process: Linking outside-in and inside-out by working in alliances with complementary companies during which give and take are crucial for success. Consequent thinking along the whole value chain and new business models enable this core process (p.1).

Based on the research data of Gassman and Enkel (2004), enterprises do not elect similar Open Innovation processes and do not implement each of the core processes in the similar level. Mostly, companies integrate one main process and adopt several components of the other two processes. In Figure 7 Gassmann and Enkel (2004) have summarized the core processes of Open Innovation.

Figure 7: The three Core Processes of Open Innovation (Nedon, 2015)

2.10.2 Outside-in-Process

The main element of the outside-in-process is the process of the integration of external knowledge into the innovation process. Another part is to use the know-how of suppliers, customers and external partners for example universities to increase the quality and speed of the innovation process (Enkel, Gassmann, & Chesbrough, 2009; Nedon, 2015).

The outside-in-processes can be characterized with the following items (Gassmann & Chesbrough, 2009):

- The intensity of knowledge is very high.
- To act as knowledge mediator and knowledge initiator.
- The modularity of products is very intensive.
Theoretical Framework

- A low tech industry for related products.

Gassman and Enkel (2004) are describing the following implementation examples of outside-in-processes:

- To include the supplier early in the processes.
- Integration of customer co-development.
- To use external knowledge sourcing and integration
- Acquisition of patents and in-licensing

2.10.3 Inside-out-Process

This process describes the externalization of internal knowledge. Companies use this process, for example to take royalties for patents and innovations, which they don't use for business operations. The inside-out process makes it clear that the place, which develops knowledge and innovation, does not have to be the place where the innovation is used and transformed into new products (Schaarschmidt, 2012).

With the purpose to earn profit companies are bringing ideas to the market, sell their intellectual property and increase knowledge by transmitting ideas to the external environment. By establishing this kind of process, enterprises have the aim to externalize their know-how and innovation for the purpose to get ideas earlier to the market as through in-house development. With this innovative stream enterprises have the opportunity to generate more income from their innovation (Gassmann & Enkel, 2004; Lichtentaler & Ernst, 2007; 2009).

2.10.4 Coupled-Process

It is a combination of the outside-in and inside-out process. The content is the internalization of external knowledge in connection with the externalization of internal knowledge. The focus is on the creation of standards and the development of markets. The particular environment should be actively involved in the development of innovation and develop simultaneously a market around this innovation through the externalization process. In coupled-processes companies are doing their development practices via co-creation with corresponding partners through joint ventures, cooperation and alliances. In establishing this kind of processes as the focus for innovation strategies, enterprises have on the hand the purpose to gain external knowledge with the outside-in process as well as to bring ideas to the market with the inside-out process (Gassmann & Enkel, 2004; Lichtentaler & Ernst, 2007; 2009).
2.11 Actors of Open Innovation

According to Zerfaß and Möslein (2009) there are three types of different actors of Open Innovation if companies plan to apply Open Innovation processes. These actors of innovations are summarized in groups and described in the following way:

- **Core innovators in companies:** Is dealing with the task of developing new products, processes, services and strategies. Generally this area of responsibility is managed by executives and management board members (Zerfaß & Möslein, 2009).

- **Peripheral innovators in companies:** These are employees who are officially not subordinated to the department of innovation and often are having self-motivation, engagement and conviction for new innovation processes (Zerfaß & Möslein, 2009).

- **External innovators:** Include customers, suppliers and value-adding partners as well as members of universities and research institutes or even competitors. Examples for this kind of actors are lead-user workshops, toolkits for Open Innovation, idea-, concept and innovation contests or Open Innovation communities. An important factor is to forward external innovators is the department of marketing (Zerfaß & Möslein, 2009).

2.12 Instruments of Open Innovation

Over the time five specific groups of instruments became common for supporting Open Innovation practices. These instruments according to Möslein (2009) are defined in the following forms and means:

- **Innovation contests:** In general innovations contests proclaim for competitive solution of concrete problems with prices for the winner. Nowadays the mechanisms of Web 2.0 are giving new opportunities for the companies to use innovation contests as an instrument for Open Innovation. They are various forms of applications, starting from pure idea- and design competitions via concept competitions to those competitions, which have the purpose to gain marketable innovations (Möslein, 2009).

- **Marketplace for industry innovations:** These are virtual places where supply and demand are coming together. They are typically
web-based platforms, mostly with companies that are searching for innovation and providers, which are suggesting concrete problem solutions. More in detail this kind of marketplace is like a mediator between provider for innovation and demanders of innovation (Möslein, 2009).

- **Innovation communities**: Enable innovators to develop ideas together, discuss them and push the development process. Innovation communities are normally internet-based they bound innovators together for specific topics. They are supporting corporate development and predevelopment of innovation concepts (Hallerstede, 2013).

- **Innovation technologies**: Describing the next step from the design of innovation to the step of implementation. Examples for this technology are 3D-scanner, 3D-printer or laser cutting machines. This is the expectation of the process of radical democratization of innovation development with the connection to the trend of ‘personal fabrication’ (Möslein, 2009).

- **Innovation toolkits**: Are providing a user environment by developing concrete innovation solutions. The advantage of this internet-based innovation instrument is the opportunity to integrate a larger number of externals in the concrete and structured innovation processes, even the do not have a specific education in these areas. Referring to Reichwald and Piller (2009) the most common types of innovation toolkits are summarized in Table 1.

### Table 1: The Innovation Toolkits

<table>
<thead>
<tr>
<th>Toolkits for User Co-Design</th>
<th>Toolkits about idea transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim</strong></td>
<td>- Transfer of existing innovation ideas from the user domain (external suggestion scheme)</td>
</tr>
<tr>
<td>- Generate innovative ideas</td>
<td></td>
</tr>
<tr>
<td>- Generate performance characteristics</td>
<td></td>
</tr>
<tr>
<td>- Individualization of performance through product configuration</td>
<td></td>
</tr>
<tr>
<td><strong>Principle</strong></td>
<td>- 'Chemistry set'</td>
</tr>
<tr>
<td>- 'Lego construction kit'</td>
<td></td>
</tr>
<tr>
<td>- 'Black Board'</td>
<td></td>
</tr>
</tbody>
</table>
Theoretical Framework

<table>
<thead>
<tr>
<th></th>
<th>- Very large solution space</th>
<th>- Predefined solution space through technical restriction by the manufacturer</th>
<th>- Unlimited solution space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- High usage costs</td>
<td>- Low usage costs</td>
<td>- Low usage costs</td>
</tr>
<tr>
<td></td>
<td>- Complete trial and error</td>
<td>- Trial and Error only fractional possible</td>
<td>- No Trial and Error principle</td>
</tr>
</tbody>
</table>

User | User with Lead user properties | All customers | User with Lead user properties |

2.13 Approach of 'Internet of Things'

The unprecedented level of development in terms of dependence and importance of the internet was not foreseen a few years ago. Due to the increasing integrate and use of any networking and information media, the development of the internet leads to a dimension which is not conceivable. Nowadays the internet is also called as the 'Internet of people' or the 'Internet of Information'. These new designations include the networking of people with the context of the increasing topicality of information exchange in many different ways. The basis of this modern option is the multiplied availability of smart connected objects, which can be connected to each other (Uckelman, Harrison, & Michahelles, 2011).

Through affiliate control systems, new networks are developed under these new objects. These networks, which are called the 'Internet of Things', have the ability to interact with the internet. Furthermore it is also possible to also integrate inanimate objects to the network. An additional feature of the “Internet of Things” includes the autonomy of the objects. This provides the possibility of autonomous or semi-autonomous acting of the connected objects in the area of their internal network structure. An example for that is an independent building technology with an integrated alarm function in cases of potential system failures. The technological background of the 'Internet of Things' cannot bet clearly assigned to a specific area but rather creates the basis of numerous scientific fields (Schaffers, Komninos, Pallot, Trousse, Nilsson, & Oliveira, 2011).

2.14 The Use of 'Big Data'

The second trend, which is determined in connection with the 'Internet of Things', includes the use of information and knowledge from the generated “Big Data”. It is crucial that from this amount of data, directly useable information is generated which additionally can be processed efficiently. These volumes of data can be made useable using two different methods. The first method considers the implementation of
intelligent methods within the control systems. Thereby it is possible to identify patterns and dependencies in large amounts and to optimize in targeted method machines, material and tool combinations (McAfee, Brynjolfsson, Davenport, Patil, & Barton, 2012).

The second method, which makes bid data useable, includes the reproduction of the reality. In this case various product scenarios are simulated in a virtual model, this model will be gradually enriched with the collected information. Furthermore it is possible to retrieve real-time information on this model. Basically, this model helps to facilitate the value creation process by providing additional information for an improved decision making process. Furthermore crucial information is available for entitled persons if needed, whereby these processes can be optimized in relation to the current conditions (Mayer-Schönberger & Cukier, 2013).

2.15 Different Perspectives of Open Innovation

The approaches of Open Innovation are mostly affecting the department of research and development. Over this perspective the following nine research areas have been developed (Gassmann, Enkel, & Chesbrough, 2010).

- **The spatial perspective:** The purpose is to explore the global area of innovation with the reason of a flat world, in which research, technology as well as product development become more worldwide and thus Open Innovation is more simplified. The benefits are to increase the reception capacity with being local to regional competence centers and to have the availability of the knowledge and competences of global talented people without hiring them (Cohen & Levinthal, 1990).

- **The structural perspective:** The development of innovation is processing to an increasing apportionment of work, especially in alliances and the outsourcing of research and development departments. With the aim of cost reduction and bigger specialization more difficult technologies and products systems are created. Thus the trend of value chains is becoming more important. The Open Innovation approach is having the major priority to look long-term and not only on customer-oriented business units (Hagedoorn & Duysters, 2002).

- **The user perspective:** The approach of mass customization gets developed over the idea to integrate the user into the development of innovation. The idea behind is to recognize customer’s requirements and to use and connect the application knowledge of the users (Franke & Piller, 2003).
• **The supplier perspective:** The pressure to increase the outcome of innovation processes requires an early involvement of the suppliers in the innovation process (Hagedoorn, 2002).

• **The leveraging perspective:** Former innovation practices are focusing on the existing market and business. Open Innovation however use consisting exploration of competencies and intellectual property’s multiplication of new market areas to develop new revenue streams (Chesbrough, 2006d; 2007).

• **The process perspective:** To achieve more openness in the process of innovation, three main processes are representing this Open Innovation practices: The outside-in process which is the most dominated process, the inside-out process as well as the coupled process. Many companies are using these processes in a complementary method (Gassmann & Enkel, 2004).

• **The tool perspective:** The required instruments to integrate externals in the Open Innovation process. For example, customers could develop their own product with a tool kit or the incorporation of knowledge mediators and idea creators in the problem solution (Gassmann, Enkel, & Chesbrough, 2010).

• **The institutional perspective:** The free accumulation of inventions, outcomes, detections and knowledge is certain property of the model of Open Innovation (Gassmann, Enkel, & Chesbrough, 2010).

• **The cultural perspective:** Companies need to adapt a culture with the competencies of know-how and external value competence. Many elements are important for this culture like supplier evaluation lists, communication platforms, management information systems and incentive systems (Bughin & Johnson, 2008).

### 2.16 Recommendation Plans for Innovations Processes

The opening of the innovation processes to external partners is a key element in order to make product development more efficiently and effectively. The characterizations in practice are different. So far Open Innovation is mainly used by large companies in the high-tech industry. A distribution to other sectors and small and medium enterprises is currently in process. According to Enkel and Gassmann (2009), the following recommendations for companies to open their innovation processes are applied:

• Introduce supplier innovation days, where suppliers deliver contributions to product and process improvement.
Theoretical Framework

- Involve customer actively in the early phase on the innovation process with using the open spaces of the pre-development for customer specific innovations. The purpose is to prefer visionary user, lead users and opinion leader. An external moderation increases the objectivity and improves the acceptance by the customer.

- Develop and edit innovation networks actively. With creating systematically innovation networks on defined search fields.

- Use external innovation platforms with a quantitative as well as qualitative size.

- Introduce innovation days with systematically external input.

- Use actively knowledge brokers for example Fraunhofer, CSEM or Porsche Engineering.

- Measure the place of innovation and set standard rates for external impulses.

- The mind-set of Open Innovation must be explicitly anchored and lived in the values and the vision.

- Promote and support diversity and controlled fluctuation, view new employees as particular valuable, as they are not professionally blinkered and therefore bring new impulses.

- The top management should exemplify the Open Innovation philosophy.

It is also important to consider in detail the business strategy as well the individual business. Only someone who creates value for customers and also receives value is innovating successful. Otherwise there is not much profit left for the company. Therefore innovation processes need to be carefully analyzed in terms of their suitability for the opening. The cultural excess profit of capable and opened employees is mostly positive noticeable on the innovation and overall success of a company (Gassmann & Enkel, 2009).

2.17 Declaration of Factors to Implement Open Innovation Practices

In this chapter the purpose is to examine and define the most suitable factors, which companies can consider on their way to become Open Innovation companies. The results are developed from existing studies and based on the theoretical framework of this master dissertation. The following six factors are seen as the most crucial for challenging the problematic situation of Open Innovation (von Dyck, 2015).
2.17.1 Managing Intellectual Property issues

Primarily the motivation to participate in an Open Innovation platform must be created among the potential developers. This can be realized by a suitable incentive system, in which the external participants will be indemnified for time, costs and the transfer of intellectual property. Practical examples are competitions, which are endowed with prize money or the possibility to work together to get a product market ready (Möslein, 2009).

Another aspect mainly relates to meet compliance guidelines. This task includes the clarification of legal and regulatory issues that especially are involving copyright, patent and trademark law. By generating an idea the participants are getting a fixed sum of money or they will be content with a thanksgiving. In disputable cases to protect their own safety, the company should clarify the transfer of rights of ideas with the innovators in advance (Gassman & Enkel, 2004).

The crucial factor is to regulate the quantity and the categories of information to minimize the company’s lawsuit risk submitted small innovator’s capture. Enterprises, which are adopting Open Innovation practices, are able to check the expenses with the usage of an automated method to control submitter’s decision of disclose information (Westerlund & Leminen, 2011).

2.17.2 Flexibility of Fast Adaption

The purpose of Open Innovation is to process ideas fast, flexible and efficient and thereby to submit a high quantity of ideas. The challenge is to manage this quantity of ideas without influencing the process of investigating and making decisions in a prompt way. With a structured screening process, which is filtering between the qualities of the ideas the efficiency for the company should be increased. To measure an enterprises return on innovation, the charges for the process and the expense for declaring the ideas have to be identified. The aim is to push the innovation ideas and thereby to increase the needed time-to-market and the enterprise’s return on innovation (von Dyck, 2015).

To achieve a faster innovation process a possibility is to use and integrate the knowledge of universities and support them with consequently promotion with the aim to get a sustainable outcome. Another possibility is to involve talents of the universities in your own project and research teams (Chesbrough, 2004).

2.17.3 Adapt an Internal Structure

Moreover the external idea generation is useless as long as it is not possible to have a successful internal further development and make them ready to the market. The strategic use of Open Innovation platforms and coordination of these platforms with
the internal research and development department is an elementary key. Another component is to challenge the detail degree of the research request and to choose the research request in a useful way. The balance between creativity and focus should be considered to decrease the proportion of unusable proposals. Generally the aim is to include supporting in-house commitment over appropriate time to achieve profits from adopting Open Innovation practices (Chesbrough & Crowther, 2006).

Programs of a successful internal Open Innovation structure are containing the following elements (von Dyck, 2015):

- Acquire ideas in an effective way.
- Verify ideas in a timely manner.
- Push decisions with the purpose of acting effectively.
- Regular communication with the innovator to update the status.
- Usage of a combination of people and technology.
- Install a specific idea submission portal with a wide range of information how the innovation program is working.
- Set standards with established and enforcing process steps about the Open Innovation stages.
- Use structured questions and responses to regulate submitted content.

2.17.4 Trust and Protection of Core Competencies

In order to ensure a successful Open Innovation culture in a sustainable way the company should conduct a risk classification, so that critical development areas could be protected. Each Open Innovation project granted insights to internal company processes, which are leading to disclosure of information and knowledge gaps. Another part is affecting the problem that employees of the research and development department are seeing it as a personal weakness if they cannot solve a problem themselves. Therefore the company must create incentives in order to get help from outside. Furthermore it is crucial that development managers of an Open Innovation projects do not only net technical knowledge but also expertise of interaction (Reichwald & Piller, 2002).

Another important task is to persuade employees who have been working for a company for many years and hence are very suspicious, when it comes to new work practices. They are arguing that with a high level of transparency and openness a lessening of their value and protection inside the company will be proceed. The anchored values and beliefs of the closed innovation paradigm have to be overcome
and a new organizational culture in the company has to be implemented (Fasnacht, 2009).

2.17.5 Acceptance of Management Board and Employee

The most crucial problem for the management board, which is challenging Open Innovation practices, is the syndrome of “not invented here” (NIH) (Katz & Allen, 1982). To overcome the not invented here syndrome companies or the supporter of Open Innovation practices have to declare an explicit growth gap and demonstrate that only in-house efforts are not sufficient enough to reach the innovation aims. The solution is to install larger structural alignments and commitments to a more open oriented approach. Moreover additional commitments could be achieved by integrate very fast the research and development, if companies recognize outside technologies in order to use in-house development as additional value (Chesbrough & Crowther, 2006).

According to Herzog and Leker (2010) the management has to push the entrepreneurial thinking into the company and support the employees, who are taking initiative. Furthermore the management board has to set a vision to lead innovation efforts. Generally the executive board is responsible to underline and support the right innovation culture.

Chesbrough (2006b) states that employees are caring about their own position inside the company by adopting external technologies. It has to be proved to get positive effects on the internal department by integrating external ideas successfully. This positive effect is resulting from those ideas, which will develop further activities based on the integrated results. The purpose is to implement an Open Innovation culture that the company’s employees are developing trust towards this new innovation approach. The idea behind this new culture is that all employees have to understand the new way of thinking and are able to work in an organized form together to unfold the most of their potential.

2.17.6 Early Integration of Customer and Supplier in the Innovation Process

It should be noted that customers have consumer expertise through which the benefits of a product for a customer can be developed completely. The objective of the customer is to get the best possible solution between the individual preference structure and properties of the product range thus will satisfy the desire for heterogeneous services (Zerfaß & Möslein, 2009).

The starting point for innovative activities is the dissatisfaction of the available solutions on the market. The benefit which is consisting of the costs of participation and the benefits which are expected from it, are acting as a driving force for the participation in the innovation process. If the customer’s knowledge can be integrated with
the adequate integration method at the right time in a project and with the appropriate conditions, the chance for innovation success will be increased. Long-term customer relationships and customer loyalty can be achieved by improving the information base. The accurate market cultivation as well as a reduced sales risk can be reached by minimizing scatter losses (Westerlund & Leminen, 2011).

Another crucial element is the pressure to increase the outcome of innovation processes. This leads to a very early involvement of suppliers into the procedure of innovation (Gassmann, Enkel, & Chesbrough, 2010).

### 2.17.7 Research Model

From the previous chapter the challenges to implement Open Innovation practices are summarized in Table 2 and declared to specific items.

**Table 2: Declaration of the crucial 'Factors of Open Innovation'**

<table>
<thead>
<tr>
<th>Managing intellectual property issues and other legal risks</th>
<th>Intellectual property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing ideas quickly, efficiently, flexibility of fast adoption</td>
<td>Flexibility</td>
</tr>
<tr>
<td>Establishing an efficient internal structure</td>
<td>Internal Structure</td>
</tr>
<tr>
<td>Protection of core competencies and building partnerships</td>
<td>Trust</td>
</tr>
<tr>
<td>Acceptance of management board and employee</td>
<td>Acceptance</td>
</tr>
<tr>
<td>Early integration of customer and supplier in the innovation process</td>
<td>Integration</td>
</tr>
</tbody>
</table>

These specific items are illustrated in Figure 9 and will be used for the further research of this dissertation. The aim of this further research is to explain and to investigate how these different specific items are dealing together as well as conflicting each other. Starting with the discrepancy of combining the early integration of customer and supplier in the innovation processes and the protection of the company’s core competencies, which is as an element of building trustworthy partnerships. This study will investigate how this challenge is affecting the adoption of Open Innovation processes. Furthermore, the theoretical framework has yielded a dependency of several challenges like the challenge of processing ideas quickly, which is the item of flexibility and how an enterprise could manage intellectual property as well the requirements of legal risks by adopting Open Innovation practices. All these challenges are combined to specific items Table 2, which are the base of this research model. Therefore this research model should explain and examine, which
challenges are affecting the enterprises innovation processes and how future Open Innovation processes can deal with it.

Figure 4: Research Model 'Factors of Open Innovation'
3 Methodology

In this chapter, the purpose is to outline the process of the designed and conducted research. The chapter starts with the Research Philosophy, followed by Research Design and Research Approach. Furthermore a detailed Research Strategy will be presented, which includes the Research Method and Time Horizon. Finally, it will be explained how the empirical findings were gathered and analyzed.

3.1 The six Shifts of the 'Research Onion'

In order to develop an appropriate research strategy it is recommended by Saunders, Lewis and Thornhill (2009) to peel off the research onion shift by shift, which consequently helps to cover the different levels, which are illustrating in Figure 10.

The research process of the research onion includes diverse and particular levels, thereby giving the author a more detailed insight and comprehension about the used methods for creating the research strategy (Saunders, Lewis, & Thornhill, 2009).

Figure 5: The Research Opinion by Saunders, Lewis and Thornhill (2009)
3.2 Research Philosophy

The main purpose of guiding suitable research is to create reliable data, which has been developed through methods that are achieved in an expert mode and therefore could be seen, as dependable. In the first step, it is necessary to determine the research philosophy, which is connected to the source and background of science (Saunders et al., 2009).

According to Saunders et al. (2009), the research philosophy can be differentiated into four different views. The different views can thereby be distinguished into positivism, realism, pragmatism and interpretivism. Positivism is an approach which aims to see social reality from a natural scientist perspective. In this context, hypotheses are generated through the usage of theory. These hypotheses are thereafter tested with data gathered through value-free observations (Bryman and Bell, 2010). The base of positivism includes subsequent aspects of phenomenalism, deductivism, inductivism, as well as the approach that science has to be objective and value free. Phenomenalism means knowledge approved by the senses can be justified as knowledge. The principle of deductivism is the intention of analysing hypotheses with the aim to evaluate explanations of laws. The understanding of inductivism is to substantiate knowledge with the collecting of facts (Bryman and Bell, 2010). The view of realism is rather independent of the individual mind. Therefore, the interpretation leads into the path of social conditioning. The research philosophy of pragmatism does not allow discussions about views like truth and reality and emphasizes the significance of the research question over philosophical views (Saunders et al., 2009).

In this the principle of interpretivism is adopted. According to Bryman and Bell (2010), interpretivism has a contrasting understanding. Interpretivism includes the approaches of authors who have a skeptical view of the scientific model to the analysis of the social world. The bases of the authors’ social science view are people and their institutions. Therefore, the research method of interpretivism needs a distinctive logic with the base of the individualism of humans.
3.3 Research Design

According to Bryman and Bell (2011) the Research Design includes the following steps:

- Formulate and develop suitable Research Questions
- Investigate two cases from different industry sectors
- The base of the empirical data will be retrieved through qualitative interviews
- Evaluate and analyse the data
- Formulate a more detailed Research Question on the base of the knowledge
- Discuss findings/conclusions

The research design provides a procedure, which includes the choice of methods, the time horizon, the research strategy as well as the research purpose in order to answer the research question (Saunders et al., 2009).

3.4 Research Purpose

There are three different research purposes, which can be used. The descriptive purpose is setting the focus of research on describing a view of an individual, incidents or specific situations. Descriptive research could also be deemed as a precursor of the two other research purposes, the exploratory and explanatory method (Robson, 2002). The explanatory purpose examines the association between variables, thereby emphasizing on a particular situation or an issue (Saunders, Lewis, & Thornhill, 2009). In comparison to that, exploratory studies are characterized by their focus to explore new understandings and insights about certain phenomena, which are currently less identified (Robson, 2002). If the researcher’s knowledge about the problematic is not well developed the research with an exploratory purpose is practical and can be proved with interviews in the area of the research (Saunders, Lewis, & Thornhill, 2009).

The study’s aim is to gain knowledge about the developing trend of innovation strategies and the possibilities of implementing open innovation practices to already existing innovation strategies. Furthermore, the study emphasizes on comparing Open Innovation strategies with traditional innovation strategies and with the network approach. Due to the aforementioned reasons, an exploratory study is carried out. Consequently, the study aims to investigate the demand for Open Innovation practices and explore the limitations and challenges when implement them. The study further strives to provide new insights about the protection of core competencies and how they relate with the concept of Open Innovation.
In order to fulfill the research purpose and answer the research questions, interviews with several companies related to the study’s topic will be conducted (Saunders, Lewis, & Thornhill, 2009). Every company will characterize as a specific single case.

### 3.5 Research Approach

According to Saunders, Lewis and Thornhill (2009) there are three different research approaches, namely deduction, induction and abduction. Within the deductive research approach hypotheses are generated by using existing theory. Thereafter the different hypotheses are tested by the applied research strategy. In comparison to that, the inductive approach aims to develop new theory by collecting empirical data. This approach is often used when the perspective of individuals have to be investigated (Saunders et al. 2009). Lastly, abduction can be characterized as a combination of deduction and induction. This approach provides the researcher with the possibility to go back and forth between already developed theory and empirical data.

According to Van Maanen, Sørensen and Mitchell (2007), the use of an abductive approach will result in a superior level of qualitative research.

In order to fulfill the study’s purpose, an abductive research approach has been figured out as the most appropriate one. Since literature gaps were identified, the usage of a purely deductive approach becomes not reasonable. On the other hand, the usage of an inductive approach would have been suitable as well. However, this alternative has been rejected since the study’s purpose requires simultaneous collection of theory and empirical data. Consequently, the study’s purpose requires the construction of a theoretical framework at the beginning, which is later on tested against empirical data. This provides the researcher with the opportunity to develop new theories or adopt existing ones.

### 3.6 Research Strategy

Saunders, Lewis and Thornhill (2009) are describing the process of research strategy as crucial in order to pursue a constant procedure while data gathering for the purpose of achieving a specific research objective.

According to Yin (2014) and Saunders, Lewis and Thornhill (2009), there are common research strategies like, grounded theory, action research, survey, an experiment, archival research, ethnography or a case study. In general, Yin (2003) describes a case study research as ‘an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used’. This definition is therefore in line with the purpose since the study aims to investigate the real life context of three selected firms. Furthermore Yin
(2014) mentions that if a study focuses to generate responses to research questions starting with 'why' and 'how', a case study strategy should be chosen.

According to Saunders, Lewis and Thornhill (2009), a multiple case study should be chosen when the aim is to get deeper results and generalizing outcomes of the case. In general, a multiple case refers to the use of more than one case (Saunders et al., 2009). This is in line with the purpose since the study focuses on comparing and evaluating different cases. This approach will in fact deliver more robust findings, which is especially necessary for such an unexplored field.

3.6.1 Time Horizon

According to Saunders et al. (2009) a study can be either cross-sectional or longitudinal. A cross-sectional study can thereby be described as a study of one phenomenon at a particular time. In contrast to that, a longitudinal study is a research over a longer time period. Thus, it provides the researcher to study changes and developments (Saunders et al., 2009).

Due to the fact that strategies can have different impacts over a certain time frame, the ideal approach would have been a longitudinal study. Nevertheless, similar to most research projects conducted for academic purposes, this study is constrained to a particular time period. Therefore, this study will focus on a certain phenomenon at a certain time.

3.6.2 Semi structured Interview

A semi-structured is chosen in this thesis with the purpose to gain an extensive comprehension of the subject and to achieve the point of view from an expert of innovation processes, regarding the understanding of future challenges and limitations of Open Innovation strategies.

Referring to Saunders, Lewis and Thornhill (2009), the focus of this kind of interview is to get deeper into the relevant data with the help of taking notes during the interview and record them for possible future issues. Semi-structured interviews are characterized as not standardized interviews and are a part of the qualitative data research as well as are classified as the best method to understand the research question with 'why' and 'how'.
3.6.3 Interview Respondent

With the aim to collect exhaustive knowledge about a specific phenomenon, it is important to choose an appropriate sample size. Referring to the interpretation of epistemology, a small sample size should be more suitable for this study as it allows in depth investigation and the gathering of subjective meanings (Saunders et al., 2009).

Therefore it was crucial to select the right sample Table 3, with the aim to get a proper overview about the challenges, which companies have to overcome by adapting Open Innovation practices. The following elements were taken by chosen the interview respondents:

- Interview respondent has to work for several years in the research & development department.

- Interview respondent has to be from a Swedish or German company.

- The company, the interview respondent is working for, has to be from a specific industry sector, preferably from the automotive sector.

- Preferably the interview respondent should have already knowledge about Open Innovation.

Table 3: Interview Respondents

<table>
<thead>
<tr>
<th>Interview Number</th>
<th>Company Name</th>
<th>Respondents Position</th>
<th>Interview Date</th>
<th>Type of Interview</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Company B</td>
<td>Innovation Manager</td>
<td>21.04.2016</td>
<td>Phone</td>
<td>50 Min</td>
</tr>
<tr>
<td>2</td>
<td>Company C</td>
<td>Innovation Manager</td>
<td>22.04.2016</td>
<td>Phone</td>
<td>55 Min</td>
</tr>
<tr>
<td>3</td>
<td>SWT Paper</td>
<td>Part Owner of the Company &amp; Manager of the innovation department</td>
<td>25.04.2016</td>
<td>Skype</td>
<td>45 Min</td>
</tr>
</tbody>
</table>
3.7 Research Methods - Data Collection

With regard to the exploratory research purpose as well as the abductive approach of the study, a qualitative research design is selected.

Robsen (2002) argues that qualitative data collection technique can be considered to be the most promising approach, in case the study aims to generate deep knowledge in an unexplored research field. In order to fulfill the purpose and answer the research questions, primary data was used, which was gathered through the use of semi-structured interviews. Generally, semi-structured interviews are applied when the goal is to research a particular in depth (Saunders et al. 2009). Moreover, semi-structured interviews consist of a list of predefined question that a researcher has to ask during an interview, thereby reducing the risk of not keeping the discussion in line with the study’s purpose and topic. However, the order of questions asked can vary from interview to interview. As a consequence, semi-structured interviews are considered to be the most prevailing technique in fulfilling the study’s purpose and meeting the research question.

In order to conduct semi-structured interviews, a guideline was developed which is based on existing theory (Appendix 1). Besides that, having a guideline in place will help the researcher to keep the discussion in line with the purpose and topic of the study (Robsen, 2002). In addition to that, all interviews were conducted though skype or phones call and lasted between 45 and 60 minutes.

With the aim to answer the research questions a multi-method approach of qualitative data collection is chosen, which is includes more than one process for the collection and analysis of data. Regarding the investigation of a less explored field, the approach of multiple methods is suitable (Robsen, 2002).

3.7.1 Interview Guide

The interview guide was created with the aim to process the conversation in accordance with the purpose and the subject of this investigation. To ensure that specific topics of interest were involved during the interview, a list of predetermined questions was applied. These questions could be further separated into four groups and contained of introduction and background, innovation processes inside the company, innovation processes with partners as well experiences with Open Innovation. By using those groups, it was possible to refer the findings to the proposed research question of this investigation. However, the sequence of questions could modify addicted on the course of the discussion as well as on the subsequent questions being asked (Bryman & Bell, 2011).
3.7.2 Data Analysis

Since this study applied a qualitative research method and its data was collected through semi-structured interviews, a qualitative data analysis was chosen. Saunders et al. (2009) suggest three main types to analyze qualitative data:

- Summarizing of meanings
- Categorizations of meanings
- Structuring of meanings using narrative

For this study a combination of data summarizing and categorizing was applied. In the first step all semi-structured interviews were transcribed. In addition to that, a summary of the key points was created by compressing long statements. This procedure facilitated a greater understanding and meaning of the information provided. By summarizing the interviews, the researcher of this study was able to identify relationships between different themes and therefore already contributed to the following categorizing process (Saunders et al., 2009).

The summarizing process was then followed by the categorization of data. This process started by the development of different categories for gathered data. These categories further helped the researcher to assign relevant parts of the interview to the appropriate categories, thereby establishing a comprehensive form (Saunders et al., 2009). Thereafter, the categorized empirical findings were compared in order to find similarities and similarities. According to Olsson & Sörensen (2011), this procedure can be defined as data triangulation.

In the last step, empirical data was analyzed and compared with existing literature. In order to do so, pattern matching was adopted. In general, this approach aims to predict patterns of outcomes, which are based on existing theory, in order to describe expected findings (Saunders et al., 2009). Consequently, the theoretical framework developed in section two was applied in order to compare and match empirical data with existing literature. As a result, existing theory could be confirmed or new findings could be revealed.
3.7.3 Data Reliability

Due to in this investigation the interpretivist research philosophy and a research design with a qualitative approach is applied, data reliability has to cope four major contents. Referring to Lincoln and Guba (1985) these contents are trustworthiness, dependability, transferability and accordance.

Trustworthiness is solving the problem, if the collected empirical data is appropriate enough to explain the research questions and if your study has the same findings and outcomes comparing to other researchers on this subject (Eriksson & Kovalainen, 2008; Lincoln & Guba, 1985). To get a high level of trustworthiness the researcher of this study has used through the whole research part the data triangulation method. Moreover the study’s purpose was the simultaneous collection of theory and empirical data from several different areas. Therefore the author is convinced that this research will have similar conclusions and results at other academic studies.

Dependability ensures accordance during the findings and is given the chance to replicate the study (Lincoln & Guba, 1985). To warrant dependability for this research, the interviews were recorded and all the relevant is preserved and available if requested.

Transferability has the importance that the gathered findings should be generalizable and potentially applicable to the results of the other researches as well in other frameworks (Eriksson & Kovalainen, 2008; Lincoln & Guba, 1985). The author assures transferability by collecting extensive relevant and significant information, as well the documentation and transparency through clarifications of this information.

Accordance ensures the neutral view of a study by not hindering into the results through prejudices, individual feelings or interests (Eriksson & Kovalainen, 2008; Lincoln & Guba, 1985). Accordance in this study is given through the fact that different data gathering sources were taken and the researcher was aware of the necessity of taking an objective point of view. Furthermore trustworthiness and transferability are emphasizing the element of accordance. Nevertheless the researcher was appreciated that all four contents of data reliability are about to have an objective point of view and as well the challenge to prevent completely imagination and subjective impacts during an investigation.
4 Empirical Findings

In the Empirical Findings the chosen case studies will be presented and divided into specific sections. First, some general information about the companies and the respondent will be presented. Following the data are gathered in the sections of internal innovation process, innovation processes with partners, experiences with Open Innovation, and concluding with the Challenges of Open Innovation.

4.1 Case A about SWT Paper AB and the Respondent

SWT Paper AB was founded in 1999 and is located Varberg in the south-west of Sweden. The company is focused on sheeting and coating of paper and paperboard in a wide range from the commercial usage to luxurious packaging of top quality products. The basis of the company’s used materials is ranging from recycled resources to virgin fiber based paperboards. The most important customer for SWT Paper is the world’s biggest furniture retailer “IKEA”. Another significant partner is “Södra”, which is participating in the forest industry. The company is divided into four sub-companies, which are responsible for products, development and the sub-companies of contract converting as well an own sub-company, which is producing the own brand. The respondent was Mathias Frenzel, who is with 50 percent part owner of the company. Mathias Frenzel is the manager of research and development department since 2008. The remit of the research and development department is the material process and product and process development, in which eleven people are employed.

4.1.1 Innovation Processes and Company Culture

According to Mathias Frenzel the company’s core business are innovation processes. With the purpose to focus on innovation, the company separated the research and development department, emphasized by “For us as a small company it was a strategic decision to separate the development department from the production environment”.

Furthermore the company’s innovation process standards are running with a “DPD” concept (Dynamic Product Development). According to Matthias Frenzel approximately three percent of the Swedish companies are using this DPD concept. “The difference is that the product concept is developing whilst the projects are operating in most of the cases only before the engineering begins”.

Mathias Frenzel is mentioning that the company’s innovation processes have a continuous change every year and the company is constantly trying to improve their processes and to systemize them as well as to find new ways of cooperation with
potential partners. “We have changed from the technical focus of innovation to strategic focus and culture, our aim is to go with the time”. Thereby the company set strategic plans for a business culture, how to work and how to communicate with their cooperation partners like customers, suppliers and universities.

A further element of SWT’s company culture is the conviction to own no patents. In Mathias Frenzel’s mind-set patents are old fashioned and not interesting anymore. Moreover the company’s leadership philosophy includes an environment where the focus is only on results thereby the task of controlling is negligible. “Our competence is our work culture” this includes how to report results, we are working with an result only working environment (ROWE), thereby the focus is only on results and we are spending very little time on controlling. This gained time we are trying to use on improving our processes.” With this philosophy SWT Paper is having the purpose to implement entrepreneurial skills and entrepreneurial leadership in an extensive way with the key to understand that concept and to respect it.

4.1.2 Innovation Processes with Partners

Due to the small size of the company, SWT Paper is practicing no in-house research and therefore depended from external partners. The company’s focus lays on process development with a high dependency on their strategic cooperation. Mathias Frenzel describes this scenario in the following way: “We are depending on network partner, we are a small part in a chain for example there is no practical development in our company and there is no capacity for in-house research, therefore we are depending on external partners and universities. In our mind-set the company’s focus is process development. Furthermore we are depending on close strategic cooperation with machine builders because we are not producing anything commercially inside the company.”

In addition to the company’s innovation culture many parties are integrated in the innovation process to work together for a solution, which satisfies the demand of the end-user. An example for a successful partnership is the cooperation with the Halmstad University, which was integrated in specific innovation projects of the company. “Innovation is about taking development products into commercial business we are depending on the end-user, the purpose is to invite the end-user in the process, and our company is only one part in an important chain. The problem is to match the need of the customer concerning all partners in the innovation process”

According to Mathias Frenzel, SWT Paper is working at least since 10 years with their main partners “IKEA” and “Södra”. During this time the partners have built a lot of trust towards each other. Thereby both partners are very much involved in the
company’s innovation process. “Trust is the most important factor for network partner in the innovation process”. Therefore in Mathias Frenzel’s estimation 90 percent of the innovation processes in the network are open.

Nevertheless Mathias Frenzel is mentioning that between the companies’ still secrecy contracts and non-disclosure agreements exists, to be able to keep the intellectual property rights and patents. The reason for that is the difference of leadership between big and small companies. For example a handshake is sufficient in small companies but big companies want to have everything documented. “Big customer and supplier are so square in their thinking” They want to have so much control”.

4.1.3 Experiences with the ‘Open Innovation’ Concept

Generally Mathias Frenzel is optimistic concerning the practices of “Open Innovation, “I’m interested in it, we already have some experiences with Open Innovation, it will go faster and will get more efficient and we will have better results in the future”.

Furthermore SWT Paper is already working with several Open Innovation approaches like the communication platforms Dropbox and Skype as well as they have experiences with marketplaces for innovation. For the future the company is planning to participate on innovation contests and innovation communities.

Another important approach of SWT Paper is to set regular meetings with the strategic partners and project teams which are normally invited every week. Therefore, the company installed especially in-house places in their office. According to Mathias Frenzel the integration in the work to their partner is about 90 percent.

The company has also little experiences in developing together with competitors, but will potentially extend it in the future. “We have one experience but very rare. It is needed in the future but only in certain areas, all companies in the paper industry, to gain products which are more sustainable but it is not possible for product development because it is too close to market. For example in “Green chemistry” we will develop together.”

According to Mathias Frenzel SWT Paper is working in a more network based model to match the innovation processes, in his opinion the Open Innovation approaches are not fully implemented but partially with a high chance to extend these practices in the future. “We will definitely work with this concept in the future. There are a lot of areas where it is possible to work with, for example most the current areas we are working with our partners.”

4.1.4 Challenges of Open Innovation and Innovation in the Future

According to Mathias Frenzel the most important factor to work with an “Open Innovation” strategy is “Trust”. Everybody in a chain has to be convinced to work with an
Open Innovation strategy. “Trust is the most crucial factor to be able to work with Open Innovation, for example our partner “IKEA”, which is a really big company, it is possible you can receive the trust factor of two or three person but IKEA has about 100 project leaders, therefore they want to have agreements and the control about the processes as well as the patents. Their aim is to have the control over the whole procedure thereby it is very difficult to work with an Open Innovation concept with such big companies.”

According to Mathias Frenzel, another problem is that many people want to have control. The reason for that is that the structures are built in the way to have control with regular written reports to leaders. “Open Innovation needs the acceptance by the company leaders”.

In addition to the challenge factor of “Trust” Mathias Frenzel is mentioning that the partners need to feel “Safety” if they will work with “Open Innovation” practices. “The challenge is that our partners will feel that it is safe. It is important that we will have the feeling that we are doing it together in a good cooperation and with a good result”

Another Challenge for Mathias Frenzel is the demand of a system. “Open Innovation has to be systematic you need the feeling that it’s structured”.

Furthermore for SWT Paper it is crucial that you can convince the employees from an innovation concept like “Open Innovation”, people are like to do things they are used to. “A change in the mind-set of the people is necessary to work with Open Innovation because the people don’t want to change their mind-set”.

Referring to Mathias Frenzel the innovation processes in the future of the forest industry have to change and adopt practices from the information technology industry, but it needs a lot of time to transform them. “The forest industry is mature, there will be changes in the future. “Process will be change how the information technology sector is working now!”

Matthias Frenzel has the opinion that it is important to know mainly the budget before start working with an “Open Innovation” concept because most of the companies are planning the project one year in advance. “Generally process and material development are good areas for Open Innovation in a wider meaning, but most project plan are for one year, therefore it is possible only to work in areas where the results are already known.”

4.2 Case B about Company B and the Respondent

Company B is a listed German company with more than 200000 employees and one of the world’s largest tyre manufacturers. Company B evolved over the years from a simple tyre manufacturer to one of the largest automotive supplier. The au-
the automotive sector with about 65 percent is the biggest part in the company. The company is structured into the following five divisions: The division of plastic products, tyres, interior, powertrain as well as the division of chassis and safety. One division can be seen organizationally like an own company. These divisions are divided into specific business units. Respondent B is working in the business unit of research and development from the interior division. Since three years Respondent B has the position of the innovation manager with the area of responsibility to observe, connect and distribute the efforts of new innovation topics in all sub-business units.

4.2.1 Innovation Processes and Company Culture

The task of the business unit in which Respondent B is working is to observe and analyse innovative trends as well as the influence of the new mobility behaviour from the beginning of a project. Furthermore the business unit is responsible for innovation accelerator with the purchase of start-ups and the development of new cooperation. Referring to Respondent B it is necessary to include very early future topics and the influence of the customer. “This topic increased over the last years at the beginning the responsible people in the area were very naive with the topic to change the innovation process and to include the influence of customer very important because supplier company”.

Referring to Respondent B the company secrets and core competencies are crucial elements in the philosophy of the whole enterprise. “Most of the projects are already known because the customer is giving the direction what he wants, for external the company secrets are closed, this very important. Therefore only few people know them. The topics are known because the future trend of this sector is general known.”

4.2.2 Innovation Processes with Partners

In the working field of new or innovative topics Company B has close cooperation with universities as well as the business unit is developing together with professors of universities in specific trend areas. Generally Respondent B is describing that the company’s purpose is that competencies and knowledge are already in the company and use innovation accelerator of external partner if necessary. “The aim is that the knowledge is already inside the company and the company already knows what the customer needs”.

Referring to Respondent B the most important factor of the innovation processes is to involve the customer in the innovation process with the reason that the customer affects future innovation steps. “Customer describes the future ideas which are the base for future steps, starting from the area of project management.” Furthermore
Respondent B is mentioning that partnerships are the focus in the innovation management area.

Respondent B is describing that the relation to customers is very open. “We are working with the principle of open network based with open communication with the customer”.

### 4.2.3 Experiences with the ‘Open Innovation’ Concept

Respondent B is describing an in-house platform, which is only focusing on new trends. “We are having a platform on which employees can write down their ideas which will be evaluated from the innovation management”.

In addition to that the company provides an internal social media platform as well as an in-house newspaper for employees, where innovation projects and actual innovation trends will be communicated.

Furthermore Respondent B is describing regular meetings of experts with the purpose to support new trends and possibilities. “We have regular meeting of innovation experts to exchange on new trends or ideas and to search for start-ups, which could be worthwhile to support.”

According to Respondent B all these mentioned innovation approaches are not under special topic. “These activities are happening unconsciously not under the topic of Open Innovation”.

Respondent B denies that his assigned division is having experiences developing together with competitors but mentions that are already thought to do that in the future in connection to consider the competition law.

Moreover Respondent B is describing that the company’s purpose is to adapt the innovation processes in the specific markets or countries. “The focus is on the customer in the specific country, but main processes are existing already”.

Generally in the view of Respondent B the company’s innovation processes are network based. “We are not working with an Open Innovation” our processes are more network-based”.

### 4.2.4 Challenges of Open Innovation and Innovation in the Future

Respondent B is describing that there is demand to change the innovation processes in the future and to consider the subject of “Internet of Things”. “We need a change of the classical view of innovation to consider faster the new trends. Very important is the subject “Internet of Things”, to connect everything which is already
known. We need a faster exchange of information, so it is necessary to be open towards this trend.

In addition to that Respondent B is mentioning to use external partner for innovation processes to manage the demand of changing the innovation process. “A big problem is that the knowledge of how to understand the new way of innovation exists only on a few experts. Thereby it is necessary to involve new competencies and knowledge to the company in areas where the competence in the company is not good enough like for the software department”.

Respondent B is describing that Open Innovation needs the acceptance by the board of direction. “The board of direction, internal management is the biggest challenge to adopt Open Innovation practices because they are not ready for Open Innovation.”

Furthermore Open Innovation needs more flexible structures to consider current problematics, emphasized by Respondent B. “The thematic must develop to a more flexible way to consider the dynamic markets and the “Internet of things”. Further development in the area of software is necessary”.

Respondent B has the suggestion that the company needs to open the innovation processes for faster innovation cycles in the future. “The company has to open the innovation process and to involve more external knowledge, faster cycles in the innovation process are necessary. Acceleration of development will become more and more important in the future”.

4.3 Case C about Company C and the Respondent

Company C is a listed car and commercial vehicle manufacturer from the south of Germany with about 280,000 employees. Furthermore Company C is a provider of financial services. Respondent C is working in the area of trend research, which is focused on investigating influences of social development, which are promoted through technology. The purpose is to find out the potential effects for the customer’s use of the vehicle. Respondent C is working since the end of last year in this position with the working content instruct studies and extract topics of the collected data. The last 15 years Respondent C was working in the innovation management department of pre-development with the remit to develop new ideas and find possibilities to implement them. This process takes place in the context of internal innovation workshops with the participation of lead user.

4.3.1 Innovation Processes and Company Culture

According to Respondent C, Company C changed the innovation process from a standardized development process to a stage gate process. The reason for that was
to consider more future topics. “In the past the focus was on standardized development process, a few years ago it changed to a stage gate process, with a high degree of maturity and milestones until the start of production. This model of stage gate gets extended to consider more the future topics before production launch and serial production.”

According to Respondent C, Company C started a new innovation workshop concept “Innovation-management 1.0” with the purpose to push faster new ideas. “Innovation-management 1.0 were innovation workshops were experts from different areas inside the company were working together with the aim to push future innovation topics”.

With the innovation workshop concept “Innovation-management 2.0” Company C introduced a program with the focus to look outside to company as well as in other branches for technological solutions, emphasized by Respondent C: “Innovation-management 2.0 was the development of new innovation areas like technology-management and technology-monitoring with the objective to create a regular cross-thematic approach counteracting to the growing complexity of innovation processes.”

With the concept of Innovation-management 3.0 Company C starts to lead with matrix organization to improve the efficiency of the innovation processes with the purpose to develop with modules and to reduce redundant development. “Daimler realized that it is not possible to organize and develop everything individual for every car therefore it’s necessary to include external knowledge in early phases of development.”

Through Innovation-management 4.0 Company C tries to influence the business cultures with an Open Innovation approach with another form to work together “These were innovation workshops how it is possible to work together with huge working groups and new ideas out of these groups.”

According to Respondent C very important for company secrets is to work in advance. “The challenge is that the product car is having a long development process until market launch. The purpose is to protect activities which you have to manage ten years before market launch and not disclose these secrecyes.”

4.3.2 Innovation Processes with Partners

Referring to Respondent C, Company C is using innovation workshops to include supplier directly to innovation topics as well as lead user workshops to invite stakeholder from other branches to work on new topics together. Furthermore experts of universities and knowledge mediators are also included to this lead user workshops.
“The focus of Innovation concepts lays on strategic alliances and networking, in contrast research projects with universities are focused more on specific topics or areas.”

Company C has already started several years ago to work in collaboration with suppliers on innovation contests and to include participants from different industry sectors into the innovation process. “15 years ago it has started to crate innovation contest with the supplier, not in general but from to time to time. Also they started 15 years ago to include participants from different industry sectors like a producer of watches in the innovation process. The challenge was to include these developed topics in the internal process. But nowadays the process landscape is better developed for these things.”

4.3.3 Experiences with the 'Open Innovation' Concept

In Company C several idea platforms are already used where employees can set and discuss their ideas. “Since over 20 years we have a portal for suggestion for improvements.”

The general instruments of Open Innovation are mainly used in company C. “All of these instruments are already used in the company, but there is lack which is connecting all these data for further steps, demand of a big data tool.”

About ten years ago Company C bought an Open Innovation tool with a surprising success. “An Open Innovation tool was used one time, and the output was surprisingly good of getting out a big amount of new ideas and information”.

Concerning the topic of innovate together with competitors Respondent C mentions the problem of competition law. “We have the problem of competitive advantages. It is general prohibited because of competition law, to bypass the competition law every car manufacturer has to participate. Consortiums are already used for standard developments. In the early phase of innovation development, the companies are developing individual.”

According to Respondent C the Open Innovation approach is mandatory in the areas of predevelopment and research. “For the areas of predevelopment and research Open Innovation is a mandatory tool which will be connected with the topic of human resource with the aim to find the right employees for our company”.
4.3.4 Challenges of Open Innovation and Innovation in the Future

According to Respondent C a challenge is to convince the employee of new innovation concepts. “Employees are used to work with the general concept for many years and don’t want to change it.”

In addition to that the new innovation concepts have to be pushed by the human resource management. “Employees are seen the new concepts as a barrier because they are used to the old concepts. The new concepts have to be accompanied with the human resource management with training of the manner of new working”.

The knowledge inside the company concerning the new innovation methods is missing. “New education courses for the company’s employees are necessary to work with these new concepts.”

According to Respondent C a transfer problem between motivated and comfortable employees regarding the new innovation practices is arising. “Motivated employees are open for new concepts but most of the people prefer the old conservative hierarchical way of working.”

Regarding the Open Innovation tool, which was already used within the company, Respondent C is mentioning missing process structures. “The problem was the company neglected in advance how they will handle the possible output of this new method. They realized that the tool will work but the area of pre-development was missing to process these new ideas, thus the company stopped to work further with this tool.”

According to Respondent C major contracts or agreements are a big challenge to adopt new innovation practices. “The biggest barriers are to change processes were the company has major agreements or contracts. It is easier to work with partners where agreements or contracts already exist.

Moreover Respondent C is mentioning that the time-factor is a challenge for Open Innovation. “On the other side it is a big effort to make new contracts before working with new partners on a topic, the time factor is crucial. The company wants to have a hedge before working with new partners.

Disclose secrecies and to keep property rights are also big factors for implement Open Innovation processes. “Also the factor of property rights is important and how the company is willed to disclose secrecies. The fear of disclosing too much information is the company’s management board”.

Referring to Respondent C it is possible to include in a long-term perspective a more Open Innovation approach. “New innovative employees which are characterized for a more innovative and communicative way of working will develop the company’s
processes in the future, thus the border of the company will be more open in the future."

Very crucial for future innovation processes is to set a central innovation strategy emphasized by Respondent C. “There is a lack of a central innovation strategy where all company departments are screened and connected together and with the power to decide if worked out results are good enough or not”.

The company has the demand of a central innovation management to connect the areas in a better way. “There is a lack of transparency on the working content if other areas are working maybe on the same innovation topic. We need a better connection between the different areas or departments. The solution could be to install a central innovation management” which are connecting the different topics, areas or departments.”

Summarized by Respondent C the most important factors for Open Innovation are to gain the knowledge of how innovation processes are working and to include external knowledge into these processes and also the demand of specific departments which are responsible for that.

“The purpose is to understand the innovation process and how new ideas are getting developed. “We need to connect all the small ideas to an idea concept and to include further know-how for a consistent process. Moreover we need an individual area, which is transferring these topics and processing these ideas for further steps to have an efficient procedure.”

Another significant element by adopting these new Open Innovation practises is the balance between trust and the necessity of contracts. “It is important to gain a relationship of trust with strategic partnerships but it is also necessary to have contracts regarding the legislation. In general it has to be documented that development processes are very broad and happen over many years.”

Furthermore Respondent C is mentioning the size of Company C as problem for Open Innovation methods. “The challenge is the size of the company and the integration of all the specific data from the particular departments, there is a tool missing for matching this problem".
5 Analysis

The Analysis chapter will show the data analysis and interpretation of the collected findings in combination with the theoretical framework. First, all three cases will be analyzed individual, subsequent a cross-case-analysis will be created on the basis of the research model, which was carved out in the framework.

5.1 Case A in General

Generally SWT Paper is on the right track in the process of having sustainable innovation processes, with the strategic decision to separate the research and development department the company sets innovation processes as their core business. According to Zerfaß and Möslein (2009) this is an important acting factor to extend their Open Innovation processes, which describes the task of the core innovation processes as the area of responsibility from the executive and management board members.

Furthermore SWT Paper has already gathered positive experiences with the actor external innovators which is also a crucial element in the process of extend Open Innovation processes (Zerfaß & Möslein, 2009). The company’s approach is to have no internal research area and therefore there are including the area of research from external partners normally from long-term network partners or from universities. The company’s purpose of this approach is to invite the end-user in the innovation process which referring to Frank and Piller (2003) is a significant research area of Open Innovation.

Moreover the company used several Open Innovation instruments and approaches in the past and also is planning to extend this area in the future. The inclusion of these instruments and approaches are important elements for supporting Open Innovation practices (Reichwald & Piller 2009).

With the consequent integration 90 percent of strategic partners into the innovation process, SWT Paper is including a major perspective of Open Innovation. Gassmann, Enkel and Chesbrough (2010) are describing this shift of paradigm with the demand of changing the structure of research and development departments from standalone to alliances with building partnerships and alliances with the purpose to create value.

In the company’s innovation culture many parties like the Halmstad University are integrated into the innovation process with the purpose to satisfy the needs of all partners in the innovation process. Referring to Gassmann, Enkel and Chesbrough (2010) the involvement of several different perspectives is crucial to manage future Open Innovation practices.
SWT Paper has a special company culture with the purpose to implement entrepreneurial skills and entrepreneurial leadership over the whole company to understand the company’s innovation concept. With this company culture SWT Paper sets the basis for future innovation practices emphasized by Bughin and Johnson (2008) which mention that companies need to adopt a culture with the competencies of know-how and external value competence.

Summarized the company works in a network-based model for handling the innovation processes with the aim to open their innovation practices in the future. The company’s challenges to adopt Open Innovation processes for the future are to convince their strategic partners of these new practices to gain more trust and make their partners feel safer. The problem is that big companies are used to have the control about the processes and with Open Innovation they have to involve external partner in secrecy. According to Reichwald and Piller (2002) as well as Chesbrough and Crowther (2006) crucial elements in finding the right Open Innovation strategy can solve this challenges of trust and safety.

Referring to SWT Paper, future challenges of Open Innovation practices can be old-fashioned employees who prefer to do things they already know and they are used to it. The purpose is to convince the employees from these new innovation concepts and eliminate the employees’ worries to lose their own position in the company if the company uses external knowledge. The idea behind this new culture is that all employees have to understand the new way of thinking and be able to work together and to unfold the most of their potential (Chesbrough, 2006a; 2006b).

Furthermore, the company needs a systematic Open Innovation structure to convince the company’s employees of changing their mind-sets in the way of how to think about innovation practices. Herzog and Leker (2010) are describing this as an important element of Open Innovation with the demand to underline and support the right innovation culture.

5.2 Case B in General

Primary Company B can be seen as a very innovative enterprise, which has the purpose to include future topics and the influence of the customer very early in the process. In addition Company B has recognized that the topic of including the customer early in the innovation processes gains significant importance. Referring to Westerlund and Leminen (2011) the successful integration of the customer in the innovation processes will increase the chance for innovation success.

In the area of innovate with partners Company B has the main philosophy that competencies and knowledge are already in the company and the usage of innovation accelerator of external partner is only taken into consideration if necessary. According to Chesbrough and Vanhaverbeke (2006) in Open Innovation practices external
knowledge has the same importance as internal knowledge. Thus Company B is not typically oriented towards Open Innovation processes.

For Company B, the most important factor of innovation processes is to involve the customer in the innovation process, which is the basis for the company’s future ideas and steps. The relation to the customer is like an open network with open communication. Franke and Piller (2003) are describing the user perspective with approach of mass customization as an element of Open Innovation. With this approach Company B is using a crucial perspective of Open Innovation.

Furthermore Company B is already applying several instruments and tools of Open Innovation like an in-house platform, an internal social media platform or an in-house newspaper. Referring to Gassmann, Enkel and Chesbrough (2010) the tool perspective is also an important factor of Open Innovation. By using these instruments Company B is engineering the early integration of future innovation topics.

With the involvement of regular expert meetings to support new trends and possibilities as well as to adapt the innovation processes in the specific markets Company B is using further components of Open Innovation. According to Chesbrough (2006) the leveraging perspective with supporting the core business consequently and the cultural perspective (Bughin & Johnson, 2008) with adapting the culture are significant areas of Open Innovation.

The most crucial challenges for Company B are to install faster and more flexible innovation cycles in the future with the purpose to involve more external knowledge as well as the challenge to convince the management board of the new practices. Furthermore a new understanding of future innovation processes has to be integrated into the company with the involvement of new competencies. Referring to Chesbrough and Crowther (2006) to overcome the not invented here syndrome for the management board, the adoption of an internal structure is required for more Open Innovation practices. In addition to that Company B is seeing the challenge to consider the subject “Internet of Things” which is according to Uckelman, Harrison and Michahelles (2011) a significant challenge for future innovation practices.

Summarized Company B is a very future oriented enterprise but they are still not applying their innovation strategy under the concept of Open Innovation. Generally the company’s innovation processes can be seen as innovation processes that are network based with a huge involvement and importance of the customer.
5.3 Case C in General

Due to the increasing complexity of innovation development, Company C changed the innovation processes from standardized development processes to a stage gate process. Gassmann, Enkel and Chesbrough (2010) are describing a demand for adopting more Open Innovation practices in changing the innovation processes from stage gate to probe and learn. With early interaction of supplier, customer and research and development partners in the innovation process.

With the adoption of the innovation workshop concept “Innovation-management 1.0” Company C started to involve experts from different areas. Enkel, Gassmann and Chesbrough (2009) are describing the outside-in-process as the necessity to include external knowledge in the innovation process.

Complementary to the innovation workshop concept “Innovation-management 1.0”, Company C started with “Innovation-management 2.0” to focus more to look outside to company as well as in other branches for technological solutions. Referring to Chesbrough and Vanhaverbeke (2006) in Open Innovation practices external knowledge has the same importance as internal knowledge and thus it is a key element of Open Innovation.

Company C emphasized this involvement of external knowledge with the innovation workshop concept “Innovation-management 3.0” and “Innovation-management 4.0”. Further components of these innovation workshop concepts were to improve the efficiency of innovation processes and to reduce redundant development. These new innovation concepts of Company C are elements of the adaption of internal structure towards Open Innovation practices (van Dyck, 2015).

Considering the long development process of the product car and have the aim to develop more in advance the company’s purpose was to protect the core activities and seccresies. Herzog and Leker (2010) are stating that a crucial part for Open Innovation is that the company’s management board has to set a vision to lead innovation efforts.

With the use of innovation workshops, Company C includes supplier directly to innovation topics. Furthermore Company C invites stakeholders from other branches to work together on innovation topics. Also experts of universities and knowledge mediators are participating on these lead user workshops. Zerfaß and Möslein (2009) are determining external innovators as a significant actor of Open Innovation. The involvement of customer, supplier or universities over lead-user workshops will be an actor to extend Open Innovation processes.

Moreover Company C is also applying innovation contests as well as several in-house idea platforms to generate innovation. Besides that the common Open Innovation instruments are already used and Company C had experiences with an Open
Innovation tool that was bought in addition. Referring to Reichwald and Piller (2009) innovation toolkits are providing the user with an environment to develop concrete innovation solutions.

The company’s challenges in extending Open Innovation practices are to persuade their employees and solve the transfer problem between motivated and comfortable employees. Chesbrough (2006b) characterizes the company’s purpose should be to implement an Open Innovation culture that the company’s employees are developing trust towards this new innovation culture.

Further challenges are that the human resource management has to push the new innovation concept as well as to install new education courses for company’s employees to gain external knowledge (Chesbrough & Crowther, 2006).

Also the subjects of disclose secrecies and to keep properties are future challenges of Company C by opening the innovation processes. In addition to that Company C has to consider major contracts and agreements in this subject. Another elementary component of adopting Open Innovation practices is the balance between trust and the necessity of contracts. The overall problem of all these challenges is the size of the company and to fulfill all the needs of all the participants and stakeholder in this big network. Gassmann and Enkel (2004) are describing this as the aspect meeting the compliance guidelines for Open Innovation.

In summary Company C is seeing the importance for an Open Innovation approach especially in the area of predevelopment and research. Moreover the human resource department has to be linked in this topic with the aim to hire the right people who are having this kind of competence to increase the process and the time-factor. Van Dyck (2015) describes these components and states that the purpose of Open Innovation is to process ideas fast, flexible and efficient and thereby to submit a high quantity of ideas and to support it with the right knowledge. Concerning the Open Innovation tool which was already used in company c, the problem of the missing structures to utilize the surprising positive outcome of this Open Innovation tool could be solved with the adaption of the right structure.

The biggest factor for Company C is to understand the innovation process and how new ideas are getting developed. The purpose is to connect all these ideas with an appropriate system. In this system it is necessary to involve external knowledge with the expertise how innovation processes are working. This should be implemented with a central innovation strategy to increase the transparency on the working content (van Dyck, 2015).
## 5.4 Cross-Case based on the Research Model

### 5.4.1 Managing Intellectual Property

Concerning the factor of managing intellectual property all companies have recognized to include future topics early in the innovation process. Furthermore all companies already have experiences with Open Innovation approaches und instruments but normally not under the topic of Open Innovation. When it comes to a joint development process with competitors, all three cases have rather small to almost no experience. Regarding the subject of core competencies, SWT Paper from case A has the philosophy to own no patents and to focus on process innovation. In Case A and Case B, company secrets and core competencies are elementary components of the company’s philosophy. Company B has the main aim that the knowledge is generally inside the company, nevertheless Company B as well the other companies are involving external knowledge from universities. Company C, which is comparing to company C, more focusing on future innovation practices, has recognized a transfer problem between motivated and comfortable employees.

*Table 4: Cross-Case ‘Managing Intellectual Property’*

<table>
<thead>
<tr>
<th>Case A</th>
<th>Case B</th>
<th>Case C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation processes are the company’s core business</td>
<td>Recognized the necessity to include future topics earlier</td>
<td>Company secrets are crucial because of the long development process until market launch</td>
</tr>
<tr>
<td>Claim to improve innovation processes continuously</td>
<td>Core competencies and secrets are the company’s major elements</td>
<td>Universities and knowledge mediator are part of the innovation concept</td>
</tr>
<tr>
<td>The company’s philosophy is to own no patents</td>
<td>Aim that the knowledge is already inside the company</td>
<td>Innovation contests with supplier and participants from different industry sectors</td>
</tr>
<tr>
<td>Strong relationships with universities</td>
<td>Close cooperation with universities</td>
<td></td>
</tr>
<tr>
<td>Already working with several Open Innovation instruments/approaches</td>
<td>Innovation instruments are used under the topic of Open Innovation</td>
<td></td>
</tr>
<tr>
<td>Small Experiences with developing together with competitors</td>
<td>No experiences to develop with competitors because of competition law</td>
<td></td>
</tr>
</tbody>
</table>
5.4.2 Flexibility of fast Adaption

Regarding the challenge to adopt Open Innovation practices fast, there is a huge difference between Case A and the other two cases. SWT Paper has the possibility to apply with faster innovation cycles because of their strategic decision to separate the innovation department from other departments. Generally all three companies are adapting their innovation practices on foreign markets. Company B and Company C have identified that there is a necessity to involve new knowledge in their innovation practices to consider the development of dynamic markets. In the example of case C, the company started continuously to counteract the development of innovation methods with installation of innovation workshops. The problem for Company C was that there was a lack of connection between the innovation department and projects within the company. Furthermore, the company was lacking knowledge to process new ideas in order to use the new innovation concept in an efficient way. Further problems were the size of the company and the derived time factor to make contracts before starting to work with new partners. A solution could be to set a central strategy for the human resource management with the purpose to find new knowledge and the right qualified employees.

Table 5: Cross-Case 'Flexibility of fast Adaption'

<table>
<thead>
<tr>
<th>Case</th>
<th>Details</th>
</tr>
</thead>
</table>
| Case A   | - The company separated the innovation department to have faster innovation cycles  
          | - Adapt innovation practices on foreign markets                          |
| Case B   | - Company’s focus is on the customer in the specific country with general processes for the basis  
          | - Company recognizes the necessity to involve new knowledge  
          | - Consideration of dynamic markets, demand of more flexible structures   |
| Case C   | - Adoption of 'Innovation-Management 3.0' to improve the innovation processes and reduce redundant development |
• With ‘Innovation-Management 4.0’ the company changed the business culture to work more open in huge working groups
• Lack of connection of all innovation department and innovation projects inside the company
• Demand of connection the human resource department with the purpose to find the right knowledge or employees
• Missing knowledge on the innovation methods
• Time factor to make contracts before start to work together with new partners
• Size of the company is a big challenge

### 5.4.3 Establish an Internal Structure

SWT Paper has already the possibility to adopt more open development practices, by changing the focus of innovation from technical to strategic focus and adapting the culture. Nevertheless SWT Paper is mentioning that there is a demand of a structured system to adopt this Open Innovation strategy. Company B as well as Company C, are using in-house platforms to provide and support future innovation topics. For both companies a significant challenge is to process and connect “Big Data” to manage future innovation strategies. Thus both companies are mentioning that a demand of faster innovation cycles inside the company is crucial. A central innovation department, which processes the new ideas, could be a way to handle this problem. Considering the experiences that Company C made with their “Open-Innovation tool”, a central innovation strategy should be implemented.

*Table 6: Cross-Case ‘Establish an internal structure’*

| Case A | • The company changed the innovation structure to Dynamic Product Development (DPD)  
• Changed the focus of innovation from technical to strategic focus and culture  
• Demand of a structured system to adapt Open Innovation |
|---|---|
| Case B | • Use of in-house innovation platforms to provide development processes  
• Regular meetings of experts to support new trends and possibilities  
• Challenge to consider ‘Big Data’ and ‘Internet of Things’  
• Demand of faster innovation cycles, development accelerator will increase their importance |
| Case C | • The company changed to stage gate process to consider more future topics before start of production |
• Adoption of 'Innovation-Management 1.0' to work with different experts from diverse areas inside the company
• Adoption of 'Innovation-Management 2.0' to develop new innovation areas
• Over lead-user workshops different stakeholder from other branches are invited to work together on future trends
• Demand of a tool which connects and push further innovation steps, challenge of big data, experience with “Open Innovation-tool”
• Introduction of training to teach the new Innovation practices to the employees
• Lack of a central innovation strategy or a central innovation department which processes the new ideas

5.4.4 Protection of Core Competencies and Building Partnerships – Trust

For SWT Paper, partnerships with their big partners are significant elements of the company’s success therefore regular meetings with the main partners are crucial. The limitation of their partnership is that their partners still want to have the feeling of being safe and having the control over the whole process. Paraphrased, the big partners want to keep their property rights and patents. In contrast to SWT Paper, Company B as well as Company C is a big company with a lot of power. Nevertheless both companies are using an open communication approach towards their strong partners. On the one hand, the challenge is the lack of trust when it comes to new projects, which the company wants to keep in-house and on the other hand there is the fear to disclose too much information. Thus the company wants to have detailed agreements before they start to work with partners. The big challenge is to find the right balance between the necessity of contracts and trust.

Table 7: Cross-Case ‘Protection of Core Competencies and Trust’

<table>
<thead>
<tr>
<th>Case A</th>
<th>Case B</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Secrecy contracts with big partners to keep property rights and patents</td>
<td></td>
</tr>
<tr>
<td>• Partnership since ten years with their main customers</td>
<td></td>
</tr>
<tr>
<td>• Regular meetings with strategic partners</td>
<td></td>
</tr>
<tr>
<td>• Trust is not enough, still necessity of agreement to have the control</td>
<td></td>
</tr>
<tr>
<td>• Strategic partner need the feeling that Open Innovation is safety</td>
<td></td>
</tr>
<tr>
<td>• Principle of open network based with open communication</td>
<td></td>
</tr>
<tr>
<td>• Innovation processes are network based with a strong partnership</td>
<td></td>
</tr>
<tr>
<td>• No trust towards new practices, company has the aim to do it on their own</td>
<td></td>
</tr>
</tbody>
</table>
5.4.5  Acceptance of Management Board and Employees

Regarding the factor of acceptance of Open Innovation strategies, SWT Paper is planning to extend Open Innovation practices in the future. The challenge for SWT Paper is to convince the strategic partners from Open Innovation processes. Furthermore SWT Paper’s employees have to gain new knowledge to be able to process and use the outcome of Open Innovation. In Contrast, the other companies with their huge company structures have the challenge that the management board is not accepting Open Innovation because they fear to lose control over the processes and consequentially lose power. Moreover company B and company C are also mentioning the demand of a system to transfer the know-how to their employees.

*Table 8: Cross-Case ‘Acceptance of Management Board and Employees’*

| Case A | Company is planning to extend Open Innovation practices in the future  
|        | The challenge is to convince the partners from Open Innovation  
|        | The company’s employees have to learn the new knowledge |
| Case B | Missing acceptance of the management board, fear to lose control  
|        | Demand of new knowledge to push the new innovation methods  
|        | Employees need the knowledge of how to understand the new way of innovation |
| Case C | Challenge to convince the employees from the innovation concepts  
|        | Open Innovation needs the acceptance by the management board, to push it from the top-down |

5.4.6  Customer and Supplier Integration in the Innovation Process

For SWT Paper the company’s purpose is to invite the end-user into the innovation process. The integration of their main partners into the innovation processes is around 90 percent. Furthermore SWT Paper is having no in-house research department, what makes them completely dependent on external partners. For Company B the customer is giving the direction of future topics and thus it is very significant to integrate the customer in the innovation process. Company C is inviting suppliers to lead user workshops and work together on innovation topics. Additionally they
are working together with suppliers on innovation contests for over 15 years now. Summarized, each company recognized that it is essential to involve suppliers as well as customers in the innovation process.

Table 9: Cross-Case ‘Customer/ Supplier Integration into Innovation Process’

| Case A | • No internal research area in the company, full dependency on external partners  
|        | • 90 percent integration of partners in the innovation process  
|        | • Company’s purpose is to invite the end-user in the innovation process |
| Case B | • The customer is giving the direction of future topics  
|        | • Most important factor to integrate the customer in the innovation process |
| Case C | • Supplier are invited over lead user workshops to work together on innovation topics  
|        | • Working together with supplier on innovation contests since 15 years |
6 Conclusion

To answer the research question in an appropriate way, this chapter will present the results, which were developed by analyzing the empirical findings in combination with the generated theoretical framework. Additionally the outcome of the created research model with its most crucial elements will be evaluated and pointed out. Moreover this chapter will show the practical implications as well as future research, which evolved out of the limitations of this investigation.

The objective of this study was to investigate the challenges of adopting Open Innovation practices in ongoing development processes. These challenges are related to the experiences of former Open Innovation practices. The most crucial factors, which were created in the theoretical framework, are intellectual property, flexibility, internal structure, trust, acceptance and integration. In the course of this investigation different important manifestations of the respective factors were determined. In addition to that, some factors are related to each other or have several similarities.

Therefore the research question can be answered by connecting the identified factors of the theoretical framework with the assessed findings from the conducted examination.

By challenging the factor intellectual property the aim should be to create a motivation to participate in Open Innovation practices among the potential developers. A further crucial element is to regulate the quantity and the categories of information to minimize the company’s lawsuit risk. During this study the increasing relevance of managing intellectual property could be identified. Nevertheless, there are huge significant differences regarding the transfer problem between motivated and comfortable employees to use future innovation practices. Furthermore there are variances concerning company secrets and owning patents, which can be derived from the size of the company. Thus this study shows that small companies are focusing more on process innovation instead of owning patents and focusing on technical innovation.

The flexibility to adopt Open Innovation processes fast and efficiently is challenging the process of investigating and making decisions in a prompt way. The aim is to push the right innovation ideas and thus to improve the needed time-to-market and the company’s return. Generally it can be identified that companies are attempting to counteract the dynamic development of innovation processes. By adopting Open Innovation processes the same problems are arising, which are affecting the company size. Smaller companies again have more opportunities to act with faster innovation cycles, for example to separate the innovation department from the overall company. In contrast to that it can be determined from this study that big companies
have to cope larger barriers to adapt Open Innovation processes in the existing innovation process structures. The major barriers are the demand of a central innovation strategy, which is connected to the human resource department with the aim to find employees with a high innovative knowledge as well the time factor. This time factor includes the duration and the effort to make contracts before starting to work together with new partners.

The challenge of adapting the internal structure to Open Innovation processes is to have an efficient internal further development. The balance between creativity and focus is essential, where the aim is to decrease the proportion of unusable proposals. This study shows that for big companies a crucial issue is to process and connect ‘Big Data’ in managing future innovation strategies. Smaller companies have better possibilities to change the process structures towards a new focus. However from this investigation it is apparent that new efforts are proceeding in establishing an efficient internal structure. With the implementation of a central innovation department, which is processing the new ideas, big companies can make a step towards overcoming those obstacles. Furthermore there is a necessity to teach the new innovation practices to the own employees. Nevertheless for all examined companies, it can be identified that there is demand for a structured system to adopt Open Innovation strategies.

Open Innovation projects are granting insights to internal company processes, which are leading to disclosure of information and knowledge gaps. Therefore the challenge is to gain trust and protect the company’s core competencies. In addition to that it is necessary to overcome the uncertainty of the internal innovation department towards new innovation practices and to convince them of the need for new innovation processes. Thereby the anchored values and beliefs of the closed innovation paradigm have to be overcome to be ready to implement a new organizational culture. From this study, it can be determined the limitation between having the control over the whole process and agreements, which are on the basis of trust. With the fear in disclosing too much information big companies generally have the necessity to make contracts before they start to work with new partners. Hence the big challenge is to find an appropriate balance between the necessity of contracts and trust.

Concerning the challenge of acceptance, it is affecting to overcome the not invented here syndrome, which is seen mostly as a weakness by the management board as well the employees. Thereby it is necessary that companies have to declare an explicit growth gap and demonstrate that only in-house efforts are not sufficient enough to reach the innovation aims. In this study it was identified that the not invented here syndrome mainly exists in big companies compared to small companies, which are planning to extend Open Innovation practices. Thus small companies have to convince their big partners from Open Innovation strategies, which are
seeing the risk to lose the power over the whole process. Furthermore, from the point of view of the management board of small companies, there is a demand to transfer the know-how of Open Innovation to their employees.

An early integration of the customer and the supplier in the innovation process is the last main challenge, which was determined in this investigation. The purpose by integrating the customer is to involve consumer expertise in the development process. Moreover, it is crucial to achieve long-term supplier relationships by improving the information base and very early integration in the overall innovation process. Generally this study shows that the company’s aim is to invite the end user into the innovation process, which is giving the direction for future topics. Furthermore all companies are having strong relationships with their suppliers and working together with them on future innovation topics. Hence the challenge of integrating the suppliers and the customers in the innovation process is largely processed.

By challenging all these factors and implementing a sustainable innovation strategy, Open Innovation will give companies a competitive advantage. Nevertheless there is still a demand to investigate the extensive effects of all these challenges and how they influence each other. From this study it can be determined that the most crucial challenge is the size of a company. The size of company is affecting the corporate and process structures, how to deal with intellectual property as well as the cooperation with companies of different sizes. The other significant challenge is the factor of trust, which is influencing the challenges of the integration of customers and suppliers as well as the acceptance of employees and the management board inside the company. To find the right balance between trusting and supporting the internal innovation department and be open for external knowledge is the key factor for success.
6.1 Outcome of the Research Model

This study shows that the challenges from the generated research model can be divided into two sectors, which are illustrated in Figure 11. The first sector is the major challenge of internal structure which is influencing the management of intellectual property and the flexibility of the internal structure. The second sector has the generic term of trust, which is related to the overall acceptance of the company towards Open Innovation and the integration of suppliers and customers in the innovation process. How all these factors in Figure 11 are connected and influencing each other could be summarized in the following way:

- Creation of a high motivation level to adopt Open Innovation processes is needed, to solve the factor of intellectual property.
- Managing the transfer problem between motivated and comfortable employees is the connected challenge to the consisting internal structure.
- Focus should be on process and technical innovation.
- The flexibility to adopt Open Innovation practices should be pushed through a central innovation strategy to counteract obsolete internal process structures.
- The necessity of including external knowledge is elementary to improve the internal data transfer.
- Overcoming the uncertainty of implementing a new organizational culture is essential, to develop a high level of trust towards granting company insights and sharing internal knowledge.
- In addition to that companies have to overcome the not invented here (NIH) syndrome and to accept that with powerful strategic partners the way to Open Innovation practices is more effective, therefore the factor of trust is crucial from this point of view.
- The specification of an early integration of the customers and suppliers into the innovation processes, is also connected to the factor of trust, but still the basis of strong partnerships.
- To reach a competitive advantage with Open Innovation, it's necessary to find a balance towards all of these challenge factors, which are connecting and influencing each other.
6.2 Practical Implications

In this study it was identified that there is a strong dependency between small companies and their powerful partners, when it comes to Open Innovation practices. Mostly, big companies want to have the control over the whole process and thereby smaller companies are not able to work individually with an Open Innovation concept. Thus a suggestion can be to give more scope of action to the less powerful partner if companies are planning to apply Open Innovation strategies.

Moreover it can be advised to install a central innovation department, which is only responsible for Open Innovation. The remit shall include to push and to provide Open Innovation knowledge throughout the entire company as well as to find the right employees with an appropriate knowledge in Open Innovation.
6.3 Limitations

By interpreting the findings, the conclusion as well as the practical implications, some limitations have to be considered.

First of all, the findings are only representing data from specific Swedish and German industry sectors. Due to the large size of the German companies, only one department and one respondent of each company was interviewed. Hence there are no relevant benchmarks from inside the companies. Furthermore it has to be pointed out that the German companies are not from the same industry sector as the interviewed Swedish company. In addition to that that, there was only one company interviewed in Sweden, thus there is no comparative data for this Swedish industry sector. Also there was no interview with a small or medium sized company in Germany and thereby it is not possible to evaluate and to analyze the data in very detailed way.

Overall it has to be referred that the findings of this study are not tested in practice or in other investigations.

6.4 Future Research

To contribute to the existing literature on Open Innovation practices, further research has to be conducted in order to prepare companies to solve the challenges in adopting Open Innovation strategies. This comprehensive research would be beneficial for the confirmation and differentiation of the findings.

As the focus in this study was only to investigate the challenges of Open Innovation strategies, further research should examine the far-reaching effects of adopting Open Innovation processes and how the challenges are influencing each other in practice.
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Annex 1 [Interview Guide]

Questions for a semi-structured interview

Introduction of background of master thesis / Theory
- Investigate the developing trend of innovation strategies
- Comparison of traditional innovation strategies and open innovation
- Comparison company network with open innovation concept
- Possibilities of implementation of open innovation concepts
- Is there a demand for open innovation or is it only a short-term trend?
- Limitations and challenges of Open innovation?
- Protect company secrets and core competencies

Research Questions
→ How open innovation practices differ from more traditional innovation?
→ In what way Open Innovation processes have changed the way innovation is organized? When is it suitable to use Open Innovation processes?

→ What are the challenges of companies to adopt open innovation practices?

About the interviewing partner:
I. What is your position in the company?
II. What is your working area?
III. For how long are you working in this field?

About the company
1) How is the company handling the innovation processes in general?
2) How does it change over time?
3) Is it more In-House innovation based or more with network partners like universities or external consulting companies?
4) How suppliers, universities and other partners are integrated in the innovation process?
5) Is your innovation strategy focusing on strategic alliances and partnerships?
6) Have you heard of the concept open innovation?
7) Have you already had some experiences with open innovation? The company?
8) What is your personal experience? Where do you think are future challenges of innovation processes and open innovation concept?
9) Are the following open innovation approaches already implemented?
A) Communication platforms
B) Innovation days for supplier/Customer
C) Management information systems
D) Incentive systems

10) Are the following instruments of open innovation already implemented?
   A) Innovation contests
   B) Marketplace for industry innovations
   C) Innovation communities
   D) Innovation technologies
       a. 3D printer
       b. 3D scanner

11) How is the degree of secrecy of innovation in the company?
12) What are your core competencies? How are you protecting them?
13) In which areas are you elaborating with partners?

14) Are these areas, areas where you think it is possible to work with an open innovation concept?
15) Have you experiences in developing together with competitors?
16) Who are your main partners?
17) How are they involved in the innovation process?
18) How long is your relationship with these partners?
19) How much of the innovation work is done in Sweden?
20) Are they working in a network or more in an open innovation concept?
21) Are there any experiences with competitors in developing together?
22) Do you think the concept of open innovation is already implemented or is it more networks based?
23) What do you think how innovation processes will develop in the future?
24) What are good areas to implement the open innovation concept?
25) What do you think are the challenges for open innovation concepts?
Tobias Schink
14.11.1986