TOWARDS IMPLEMENTING SUSTAINABILITY-ORIENTED INNOVATION INTO COMPANIES
— AN ANALYSIS OF INDUSTRY-UNIVERSITY COLLABORATIONS IN THE FASHION SECTOR

Thesis for One-Year Master, 15 ECTS
Textile Management
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Abstract

Purpose
The purpose of this thesis is to investigate how to release the potential of industry-university collaborations promoting sustainability-oriented innovation by analyzing the projects between the University of Borås and the Swedish fashion industry. As a result, it is the aim to develop a model which increases the effectiveness of these project collaborations and thus drives forward sustainability-oriented innovations in order to increase sustainable development within universities and companies. In the scope of this model, factors are identified, which if managed correctly, increase the probability of the collaboration. The outcome is a good practice model for successful industry-university research collaborations.

Methodology
This research follows a qualitative approach, including abductive reasoning. Therefore, a comprehensive literature review is conducted, delivering the basis for semi-structured interviews which provide empirical data. The results of the interviews are coded according to a template discussion, analyzing frequently used words and phrases resulting into focus areas for this research.

Findings
The results show that the sustainability-oriented innovation projects promote the companies’ strategic sustainable development on a long-term perspective. The industry and the university receive comprehensive knowledge which is created through synergy effects. The investigation discovered that the main driver for industry and university is the development of new sustainability-oriented innovative business models and the obtaining of new valuable knowledge. Out of the findings, a model could be created, presenting factors found to have significant impact on the success of the projects.

Contribution
This thesis contributes to academia as well as industry by developing a framework for the release of the potential beneficial impact of industry-university collaborations on strategic sustainable development. Further, the findings support and encourage the collaborative work between the fashion industry and universities towards sustainable development in Sweden. Thereby, this thesis supports the interconnection of different sectors by bundling their capabilities and knowledge to create innovation and progress in society.

Keywords
Industry-University Collaborations; Project Evaluation; Sustainability-Oriented Innovation; Strategic Sustainable Management; Fashion Industry
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1. Introduction

The first chapter of this thesis introduces the reader to the background of the given problem followed by a detailed outline of the problem in focus. Afterwards, the objective of this research is created by the research purpose, gap and research questions.

1.1 Background

Increasing concerns about the depletion of natural resources, environmental pollution, global warming and social inequity (Global Footprint Network, 2018; Darvas & Wolff, 2014), led to the resolution of the common goal to work towards sustainable development (United Nations, 1987). Economy and society are called to actively participate in this transition (United Nations, 2018). In this context, the role of sustainability-oriented innovation (SOI) has received increasing attention in sustainability research (Karakaya et al., 2014). SOI implicate making conscious changes to an organization’s values, products, processes or practices and thus strategy, in order to create environmental, social and economic value (Adams et al., 2016). As SOIs are argued to be multidimensional and thus more complex, riskier and require new ideas as well as information as well as resources that are more distant to the organization’s own environment (Perl-Vorbach et al., 2014; Fichter, 2005), cooperation is perceived to be the optimal strategy to implement such SOIs (Harms and Klewitz, 2013; Klewitz, 2016; Perl-Vorbach et al., 2014). Collaborations exists in various constellations, however, the given thesis focuses on industry-university collaborations.

1.2 Project Case Description

The two discussed project collaboration cases take place between the University of Borås (U) and five companies, all operating in the Swedish fashion industry. Whereas Company A, Company B and Company C are fashion brands headquartered in Sweden, Company D is operating as a B2B with a focus on IT solutions and Company E is a consultant agency. The two projects act independently from each other as they are operating in different areas within sustainability. However, both projects target the promotion of SOI in the fashion business, short-term and long-term. Consequently, the discussed projects can be seen as SOI cases as they intend to make conscious changes to an organization’s values, products, processes or practices and thus strategy, in order to create environmental, social and economic value (Adams et al., 2016).

The first project (Project 1) aims to develop new and innovative business models in the field of circular economy\(^1\). In detail, it targets the development of structures for circular processes which enable the redesign of sorted out fashion items. Main objective is to reduce textile waste long-term and to strive for a prolonged life of fashion products (University of Borås, 2017).

\(^1\) Within circular economy, it is the aim to be able to fully reuse the used resources again after the lifecycle of a product. Precondition for this are closed recycling cycles of products (Ellen MacArthur Foundation, 2017).
The project is divided into sub projects since it is adjusted individually for Company A and Company B.

Project 2 targets the development of a digital demonstrator for virtual mass customization\textsuperscript{2}. which is designed to facilitate an agile and faster response to customer demand. The aspired tool is supposed to pave the way for a removal of overproduction, the elimination of stock-outs and the reduction of return rates in e-commerce (Re:texture, 2018). Until now the project is solely put into operation by Company C. Company D and Company E take in a supporting role in the development of the digital tool, nevertheless, they are playing an ancillary role in the application phase.

As already mentioned above, Project 1 as well as Project 2 are both conducted in collaboration between the University of Borås and Swedish companies, operating in the fashion business. In order to clarify the relationship between these companies and the university, it is important to outline that all parties have a Swedish background wherefore same cultural values are shared. According to Högberg and Adamson (1983) the cultural and educational background of the Scandinavian countries enables efficient work in project groups of equals. Further, they add that Scandinavians are more adapted to work in project organizations where the overall achievement of the group is important. This can be lead to the fact that Scandinavians are seen less ‘individualistic’ with strong ties to the group to which they belong. Small power distances and a less authoritative organizational systems are common in Scandinavia. Högberg and Adamson (1983) summarize that due to the Scandinavian project culture, new effective working procedures can be implemented. Taking a closer look at the project culture of the given cases, it has to be outlined that the University of Borås has a strong business and research network within the Swedish fashion industry (University of Borås, 2018).

1.3 Problem Statement & Research Gap

As stated in theory, there is a growing trend for stronger alliances between academia and industry (Barnes et al., 2002; Perkmann et al., 2001; Santoro & Chakrabarti, 2001), collaborations between industry and university are predominantly portrayed as an increasing enrichment for both parties (Barnes et al., 2002; Moilanen et al., 2015). More precisely, they are presented as highly beneficial for the development of SOI (Selsky & Parker, 2005; Bryson et al., 2006; Harms & Klewitz, 2013; Klewitz, 2016). However, it cannot be generalized that the expected benefits can be transferred to all types of industry-university collaborations across all branches. There is also scientific evidence, that these collaborations are not always an optimal solution approach, leading to a win-win situation (Fadeeva, 2004; Newig et al., 2011). For instance, an increase in the number of actors involved can for instance be an inhibiting factor for the successful implementation of a decision and therefore for the achievement of the aspired goal, in this case sustainable development (Newig et al., 2011).

\textsuperscript{2} Mass customization describes the individual design of products and services through high process flexibility and integration (Da Silveira et al., 2001).
Due to the diverse nature of organizational structure, differences in the project development and implementation within the partnership between industry and university may occur. So far it has not been researched what discrepancies in regard to SOI project collaborations of university and industry exist and how to overcome them. Barnes et al. (2002) evaluated the findings of six collaborative research projects in order to identify factors which are supposed to increase the probability of a collaboration being perceived as successful by academic and industry. However, those factors are not focused on SOI. Jones et al. (2017) examined the role and effect of industry – university interactions on innovation outcomes and firm performance in SOI in small and medium-sized enterprises, without putting emphasis on project management evaluation. Within the research conducted Klewitz (2017) it was explored how industry – university collaborations can form a company’s strategic orientation, moreover, network-patterns were observed. Hence, also this research is mainly outcome oriented, absent from concerning the discrepancies and their solution.

Moreover, existing research of this kind was not conducted so far in relation to the fashion sector. The research that does exist investigates SOI such as circular economy, zero waste etc., sharing economy only as such (Todeschini et al., 2017). However, the relation to industry – university collaborations is missing. This is despite the fact that collaborations are claimed to offer a great potential to promote and support SOIs and the fact that there is high interest in academia and practice to transform the fashion industry towards being more sustainable. The purpose of this research is to begin to address this gap by examining how the potential beneficial impact of industry-university collaborations on strategic sustainable development can be released, using the case of the collaboration between the University of Borås and the Swedish fashion industry. Literature clearly states, that evaluation and performance measurement are beneficial for both parties for the project success (Linzalone & Schiuma, 2015; Todorovic et al., 2014). In contrast to this, these project collaborations have not been evaluated yet, from a neutral perspective in regard to project collaboration management.

1.4 Research Purpose

The purpose of this thesis is to investigate how to release the potential of industry-university collaborations promoting SOI by analyzing the projects between the University of Borås and the Swedish fashion industry. As a result, it is the aim to develop a model which increases the effectiveness of these project collaborations and thus drives forward SOIs within universities and companies. In the scope of the model, factors are identified, which if managed correctly, increase the probability of the collaboration. The outcome is a good practice model for successful industry-university research collaborations.
1.5 Research Questions

By gathering the background information to the problem statement and research gap, the following research questions were formulated. An overall question is formulated, which should be answered by the use of three supporting sub-questions. In order to answer the questions, the case of SOI collaborations of the University of Borås and the Swedish fashion industry is used.

Q: How can the potential beneficial impact of industry-university collaborations on strategic sustainable development be released?

Q1: How do the sustainability-oriented innovation projects influence the strategic sustainable development of the chosen Swedish fashion brands?

Q2: What are the drivers and challenges of the sustainability-oriented innovation collaborations between the University of Borås and the chosen Swedish fashion brands?

Q3: What factors need to be considered when evaluating sustainability-oriented innovation project collaborations between universities and fashion brands?
2. Theoretical Framework

The following chapter presents the literature review. The aim is to present the existing literature in the area of the chosen research field. Therefore, the literature review is subdivided into three research divisions: Strategic Sustainable Development, Industry-University Collaborations and Project Management and Evaluation. The literature review serves as basis for the guiding theories within this research. In each research division the most relevant theories are chosen and presented in order to cover all of the three areas.

2.1 Research about Strategic Sustainable Development

2.1.1 Strategic Sustainable Management

Sustainable development (SD) is a guiding vision to tackle nowadays environmental and social challenges such as the depletion of natural resources, environmental pollution or increasing poverty (Global Footprint Network, 2018; Darvas & Wolff, 2014). It is defined in the Brundtland Report "Our common future" as a development which “meets the needs of the present without compromising the ability of future generations to meet their own needs” and was set as common goal of governments and businesses (United Nations, 1987, S.24). In order for the concept to be realized it has agreed upon that members of all levels of society, among them civil society, business, government etc. become involved in creating such a sustainable development. The Agenda 2030 for Sustainable Development gives corporations in particular an important role in efforts to achieve the goals of sustainable development, based on its ability to invest and innovate (United Nations, 2018).

In order to achieve sustainable development, it is argued that a strategic approach is needed as it requires structural changes (OECD, 2001). In the context of business management, operating strategically implies setting goals and finding a strategy to achieve them. This means having an underlying vision, based on solid evidence, to set priorities, goals and direction and a general plan to achieve them. James Brain Quinn defines strategy as, "the pattern of plan that integrates an organization’s major goals, policies and action sequences into a cohesive whole" (Quinn, 1981, p. 43). Hinterhuber (2004) describes strategy as a way of using the resources and capabilities of an organization. Sadler formulates “Strategy is something that unfolds over time, during that time period the environment is changing with rapidity and can invalidate the assumptions on which the plan was based” (Sadler, 2003, p. 1).

With regard to sustainable development, being strategic requires an understanding of the concept and its implications, as well as a set of actions. The OECD defines a strategy for sustainable development as follow: “A coordinated set of participatory and continuously improving processes of analysis, debate, capacity-strengthening, planning and investment, which integrates the economic, social and environmental objectives of society, seeking tradeoffs where this is not possible” (OECD 2001, p. 16). Those strategies and processes within a corporation that are economically competitive, socially responsible and environmental friendly are referred to as sustainable strategic management (SSM) (Stead & Stead, 2013).
In addition to governmental demands for organizations to contribute to SD, there is also a high perceived pressure from stakeholders to address the societal impacts\(^3\) of their operations (Waddok, 2008; Pedersen, 2014). According to the *Stakeholder Theory* (Freeman, 1984) corporations have duties to multiple stakeholders, internal and external parties such as employees, customers, governments. As a consequence, the implementation of SSM becomes an even more important issue to organizations. In addition, research about Corporate Social Responsibility (CSR) within the fashion industry showed that businesses tend to conform to stakeholder requirements (Pedersen, 2014). Lozano (2015) summarizes the pressures and drivers for corporate sustainability into internal, external and connecting factors (see figure 1). Lozano concluded in his research, the most important internal drivers are leadership and the business case. As most important connecting driver he names reputation. According to the author, the most important external drivers are customer demands and expectations, and regulation and legislation (Lozano, 2015).

\[\text{Figure 1 Drivers for Corporate Sustainability Model (According to Lozano, 2015)}\]

In this context the Framework for Strategic Sustainable Development (FSSD) was developed (Broman & Robèrt, 2017). Which has the purpose to identify the economic, environmental and social issues that are important to an organization and offers a strategic approach for sustainable solutions. It includes an operational definition of sustainability and it offers strategic guidelines for organizations on how they can support the transition towards sustainability, by stepwise reducing their negative impacts on ecological and social systems while strengthening the own organization (Broman & Robèrt, 2017; França et al., 2017). An optimal base for implementing sustainable strategic management is built by the concept of *business ecosystems* (Moore, 1996), according to which businesses cannot be regarded as an isolated construct but need to coalesce and build mutually beneficial relationships with its environment, meaning its stakeholders, such as customers and suppliers as well as other businesses. It is stated that in its structure it creates socially and ecologically responsible economic opportunities for their members (Stead & Stead, 2013).

\(^{3}\) Societal impacts refer to both society and nature.
Since this thesis addresses collaborations for sustainability, it is important to state which viewpoint on the issue of the interaction between a corporation and its environment underlies this study. The chosen concept the Two Tiered Sustainability Equilibria (TTSE) (Lozano, 2008) is similar to the triple bottom line, which has a significant degree of acceptance in the corporate context, however, the TTSE is extended by another dimension (Amini and Bienstock, 2014). Thus, TTSE advocates that the long-term success of a company and its environment depends on two "dynamic and simultaneous" equilibria, which is why Lozano (2008) describes is as a holistic approach. The First Tier Sustainability Equilibrium represents the interactions of the three dimensions economic, environmental, and social, in the present. The Two Tiered Sustainability Equilibrium incorporates the fourth dimension (time), so the three dynamic dimensions interact with the future in mind, meaning short-, long- and longer-term perspectives (Lozano, 2008).

**Sustainability-Oriented Innovation within SSM**

Within sustainable strategic management literature, the role of innovation for corporations to become more sustainable has received increased attention (Karakaya et al., 2014). Innovation is defined as ‘the successful exploitation of new ideas’ (DIT, 1998). In the context of sustainable development, it is referred to as environmental, sustainability, sustainability-oriented innovation etc.. Environmental innovation characterizes innovation that explicitly stresses the reduction of environmental footprints (OECD, 2009). However, within this thesis SOI are addressed, consequently also social and economic aspects, next to environmental aspects are relevant. Such SOI implicate making conscious changes to an organization’s values, products, processes or practices and thus strategy, in order to create environmental, social and economic value (Adams et al., 2016). Thus, SOIs reflect the interplay between technological and systems innovations (Klewitz, 2017). Fichter (2005) argues that SOIs can be more complex, riskier as well as resource and knowledge intensive than conventional innovations.

**Classification of SOI**

Recent studies aimed to conceptualize a classification for sustainability innovations. Varadarajan (2015) for instance distinguishes between three sustainable innovation types (resource use reduction or resource use efficiency innovations, resource use elimination innovations, and resource use substitution innovations) and five major sustainable innovation opportunity stages (upstream supply chain, production, downstream supply chain, use or consumption, and post-use or post-consumption). Whereas Adams et al. (2016) categorize SOI in their model by the level of how sustainable the business approach is, which is characterized by innovation objective, innovation outcome, and innovations relation to the firm. The categories from least to most sustainable are: operational optimization, organizational transformation, systems building. Klewitz (2017) categorizes SOIs in four different categories on the basis of two dependencies: change in behavior, routines, tools, knowledge and change in technology, knowledge. A SOI with a low extend of both the factors would in this case be categorized as process innovations, whereas the highest extend of both factors would be system innovations. A concentration on change in technology, knowledge but little emphasis on change in behavior, routines, tools knowledge is accordingly characterized as Product innovation.
2.1.2 Role of Collaborations within SSM

An increasingly common way to address complex social and ecological problems, as building block of a company’s SSM, are collaborations (Selsky & Parker, 2005; Bryson et al., 2006). Called as “collaboration paradigm of the 21st century,” (Austin, 2000, p. 44), the “new organizational zeitgeist in dealing with societal issues” (Vurro et al., 2010, p. 40) and a “stunning evolutionary change in institutional forms of governance” (Alter & Hage, 1993, p. 12, cited in Selsky and Parker, 2005, p. 849), they are seen as new promising concept to approach complex problems in today’s late modernity. Also, a global survey conducted with 766 CEOs in 100 countries showed that “seventy-eight percent believe that companies should engage in industry collaborations and multi-stakeholder partnerships to address development goals” (Lacy et al. 2010, p. 11). The reason for the increasing focus on the concept of cross-sector partnerships is its potential to address sustainability issues that are too extensive to be solved by an individual organization by combining resources, skills and knowledge (Gray & Stites, 2013). Further, Perl-Vorbach et al. (2014) state that since the nature of SOIs is multidimensional and that its development requires knowledge, skills and research which are distant to and separate from an organization’s knowledge base. Klewitz and Hansen (2014) also say that SOIs require new ideas and information as well as resource exchange in knowledge flows that are more distant to the enterprise’s own environment. Therefore, cooperating with a range of external actors is presumed to increase the capability for SOIs (Harms & Klewitz, 2013; Klewitz, 2016; Perl-Vorbach et al., 2014).

How can collaborations be characterized?

According to Wood and Gray (1991, p. 146) a collaboration "occurs when a group of autonomous stakeholders of a problem domain engage in an interactive process, using shared rules, norms, and structures, to act or decide on issues related to that domain". Michaels (2009, p. 998) states that Partners bring different competencies and explore “how what they know can productively and usefully be juxtaposed with the expertise of others.” The collaborations particularly addressed in this research can be understood as cross-sector social-oriented partnerships (CSSPs). They are defined by Waddok (1991, p. 481-482) as "the voluntary collaborative efforts of actors from organizations in two or more economic sectors in a forum in which they cooperatively attempt to solve a problem or issue of mutual concern that is in some way identified with a public policy agenda item".

There is a lot of previous research within inter-organizational relations (IOR) as well as within collaborations of industry and government, civil society or community, non-governmental organizations (NGOs) and universities showing that working collaboratively can help reach the dynamic sustainability equilibrium (Lozano, 2009; Seuring & Gold, 2013; Govindan et al., 2016; Gray & Stites, 2013). Lozano (2007) highlights within his research about collaborations for sustainability development, using game theory, the need of addressing sustainability through collaborative approaches. As key requirement for collaborations promoting sustainable development he names communication, experience sharing and involvement among all parties within a society. Furthermore, he states that "a change from individualistic mindsets and behaviors is needed" so that differences among the parties can be used in a beneficial way, instead of resulting in hatred (Lozano, 2009, p.373). Moreover, in the context of SOI, it is
argued that in order to implement the innovation process for SOI in an organization, it is required to cooperate, so it can overcome its resource limitations (Freel, 2005; Hansen & Klewitz, 2012). This goes in line with the resource dependence theory, according to which organizations with different resources can benefit from a collaboration with each other, as they can provide each other with needed resources (Lambell et al., 2008).

Furthermore, research about joint efforts of NGOs and businesses, shows that within those so called green alliances (Stafford & Hartmann, 1996) companies can profit from the ecological, scientific and legal expertise of NGOs (Stafford et al., 2000). Moreover, NGOs can mediate between the corporation and other diverse stakeholders, whose support may be relevant to support the company's enviropreneurial \(^4\) activities (Stafford et al., 2000). In this context, the ability to negotiate and build social networks is called strategic bridging (Stafford et al., 2000). NGOs can procure corporate support from other stakeholders, such as consumers and the media. An example for that within the fashion industry is the alliance between H&M and Greenpeace. H&M was praised by Greenpeace for being trendsetters for green textile production, after engaging in their “detox campaign” (Greenpeace, 2016). Before that, Greenpeace was known for heavily criticizing H&M. Those alliances should also be reflected critically, since they can threaten public trust, as they are fraught by paradoxes and may lead to a greenwashing image (Gray & Stites 2013).

In addition, there is also research showing that collaborations are not per se the optimal solution to promote sustainable development. Fadeeva (2004) for instance states three main points of criticism in relation to sustainability collaborations: the lack of specific results, neglect of the broad public interests and the performance of collaborative initiatives that is lower than expected. Fadeeva (2004) says that successful collaborations, requires effective and consistent usage of correct principles for collaboration, among them trust, realistic targets, commitment and monitoring, however, even the correct application of the principles of collaboration does not necessarily lead to the desired environmental results. The author further says that success of sustainability collaborations often cannot be evaluated since there is no common understanding of what makes a collaboration successful, it depends on which criteria will be evaluated (Fadeeva, 2004). Moreover, case studies with assessments of collaborations where mentioned, which showed that, in contrast to popular beliefs, collaborations resulted in an increase of resource use instead of its reduction (Fadeeva, 2004).

In addition, Newig et al. (2011) conclude in their research, investigating the principles of collaboration from a theoretical viewpoint, that cooperation can sometimes even cause the opposite to what it was intended to do in relation to sustainable development. They e.g. argue that within implementation theory, an increase in the number of actors involved is an inhibiting factor for the successful implementation of a decision and therefore for the achievement of the aspired goal, in this case sustainability (Newig et al., 2011). Further they infer, according to theoretical considerations, cooperation is unlikely considering dominating vested interests and add that even when cooperation comes about, vested interests will influence the collaborative

\(^4\) The term enviropreneurial refers to entrepreneurial innovations and approaches addressing environmental, economic and social objectives (Stafford et al., 2000).
effort, which might adversely affect the objective pursued (Newig et al., 2011). In the end, they say cooperation could in fact work and be relevant for sustainability, however its success is connected to some requirements. First of all, the right socio-cultural environment has to be given, since it was found out that empathy is essential in collaborative situations. Moreover, they suggest that the group formulating the rules of collaboration should be quite small and the resource that is addressed should be limited to internal goods, instead of public goods. Also, in order for the communication process to be successful, the size of the team should be small and communicate at local level (Newig et al., 2011). This view is also shared by Fadeeva (2004), who says that collaborations do have a potential beneficial impact on complex sustainable problems, however, they are do not work in all contexts, and only under certain circumstances.

2.1.3 Role of Universities within SSM

Learning for Sustainable Development (L4SD) or Education for Sustainable Development (ESD) are widely accepted concepts, which hold the view that knowledge and skills are essential to approach sustainability challenges (Barton & Dlouhá, 2011). Moreover, in Agenda 21, released at the Rio Summit, the role of academia in efforts to contribution to the decision-making processes concerning sustainable development, was stressed (UNCED, 1992).

In this context the concept of Regional Centers of Education (RCEs) has arisen, which is described as "innovative platforms to share information and experiences and to promote dialogue among regional/local stakeholders through partnerships for sustainable development" (Dlouhá et al., 2011, p. 47). The RCEs aims to link universities with the outside world beyond research by cooperating with relevant civic or policy making organizations such as NGOs, local governments, and businesses. The purpose is to extend the role of universities as Higher Education Institutions (HEIs) towards a "direct positive and meaningful role in society so that they become one of the most important players in positive societal change" in addition, universities should have sustainable development as a topic of academic study (Dlouhá et al., 2011, p. 49). In this context Clark (2001, p. 1066) points out that “institutions are needed that can promote the integration of knowledge and action that is central to the learning strategies for sustainable development”. Universities are institutions like that, as they are involved in regional and international networks comprising a wide variety of stakeholders, also civil society organizations or citizens, moreover they are involved in sustainability science (Sedlacek, 2013). Most research in this context, however, refers to HEIs contributing to SD on a regional level (Karatzoglou, 2012).

Sedlacek (2013) names in her study about the role of universities in SD at the regional level three main functions (education, research, and governance) which qualify universities to become a bridging institution between government, business and society in order to support sustainable development. Universities have further been considered as a source of knowledge for SOI in cooperations (De Marchi, 2012; Hansen and Klewitz, 2012). Studies show that in interaction with HEIs firms can enhance their capabilities for innovation or access new

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5 Agenda 21 is the agreement adopted by all participating nations at the Rio summit for environment and development, which includes a plan of action to approach environmental and social problems facing the planet.
knowledge (Bishop et al., 2011; Etzkowitz & Zhou, 2006). Literature shows that companies lacking capabilities for the implementation of such SOIs, whereby especially education is a lacking resource. A typical suggestion for how universities can contribute to SD is the change in the university's own management practices (e.g. involving in recycling schemes, energy efficiency initiatives etc.) (Karatzoglou, 2012). Moreover, according to Karatzoglou (2012), HEIs have leading roles in coordinating, promoting the integration, synthesis, critical reasoning, and system-thinking skills, supporting students and researchers beyond skill development to cope with the future multidisciplinary complex challenges of sustainability. Further, Adomssent (2011) mentions HEIs can contribute to SD by serving as sources of expertise about technical and cross-disciplinary issues like climate change. In addition to knowledge transfer, another crucial point for HEIs to contribute to SD, is knowledge production, meaning research within this area by holistic and transdisciplinary thinking (Sedlacek, 2013). Moreover, he names accomplishing their cultural mission, which means to reach "beyond skills development toward employability by promoting ideas and critical thinking skills for well-functioning democracy" (Adomssent, 2011, p. 11).

2.2 Research about Industry-University Collaborations

2.2.1 The Development of Industry-University Collaborations

Organizations are pressurized to constantly advance and develop knowledge and new technologies in order to achieve long-term performance and success. Inter-organizational collaborations use this as a starting point by facilitating the advancement of new technologies. Due to its rich potential, especially industry – university relationships are a growing trend in the field of international collaboration (Santoro & Chakrabarti, 2001). According to Moilanen et al. (2015) collaborations between universities and companies are a powerful mechanism for new knowledge creation. Collaborations can stimulate learning and promote the advancement of new technologies (Betts & Santoro, 2011). The intention is to generate innovation by including a two-way flow of knowledge as both parties are interested in the knowledge of the other (Moilanen et al., 2015).

The relationships of industry and universities have a long historical background (Santoro & Chakrabarti, 2001). According to Bower (1993), the German pharmaceutical firm Bayer already collaborated with universities in the late 19th century. Furthermore, the National Research Council in the US, united researchers of universities with those in industry in order to assist the war effort during World War I (Reams, 1986). Nowadays, the changing nature of competition constraints organizations to continually create and develop new technologies. Global competition, short product life cycles and an increased pressure on corporate profits make it difficult for firms to bring forward knowledge and new technologies. As a consequence of this development, inter-organizational collaboration is frequently conducted in order to develop and commercialize new technologies. The combination of resources and capabilities provide synergies which would not be possible for these organizations to develop on their own (Moilanen et al., 2015). There are a number of drivers and potential benefits wherefore industry and universities are entering into collaboration. The literature in this research area is continuing
to grow, various research projects and models have been set up in order to investigate the field of international collaboration.

2.2.2 Drivers and Benefits of Collaborations

Within an industry-university collaboration, “both industry and universities seek to establish close ties with one another for a number of reasons” (Santoro & Chakrabarti, 2001, p. 157). Industry-university partnerships generally occur in specialized areas, in order to increase knowledge and resources by exchanging university research output and industrial experience. The increased interaction of both parties allows the industry to benefit from outsourced activities and enables the university to generate new knowledge which verifies previous research work (Dooley & Kirk, 2007). In general, it can be said, that firms are often aiming to enhance their image and reputation by associating with well-known university institutions (Fombrun, 1996), whereas universities are primarily interacting with industrial organizations to facilitate fund-raising for their projects. Industry funding involves less bureaucratic red tape than funding from the government, wherefore industry funding is very appealing for universities (Santoro & Chakrabarti, 2001).

New fields of research are becoming accessible, wherefore industrial organizations are gaining access to trained students, professors, facilities and technologies (Betts & Santoro, 2011). Industry collaborations offer universities the possibility to expose students and faculty members to realistic and viable problems. Ideally these kinds of collaborations pave the way for the development of internships for current students, the creation of employment opportunities for graduates as well as the access to applied technologies (National Science Board, 1996). As Santoro and Chakrabarti (2001) point out, especially the advancement of new technologies might be one of the most important drivers for industry-university collaborations since new research opportunities are created. In this context it is interesting to state that the number of patents invented by universities and their industrial partners have increased significantly during the last decades (National Science Board, 1996; Santoro & Chakrabarti, 2001). It is of high importance to identify the benefits, companies and universities are expecting from R&D collaboration, in order to give an indication of the success factors of the collaboration (Grimaldi & von Tunzelmann, 2002). In the following, the drivers and benefits for companies and universities, stated by Cohen et al. (2002), Perkmann et al. (2011) as well as Grimaldi and von Tunzelmann (2002), are reflected separately from each other. The mentioned researchers are using the terms ‘drivers’ and ‘benefits’ related to each other. Whereas Perkmann et al. (2011) put emphasis on the drivers of collaboration, Grimaldi and Tunzelmann (2002) focus on the benefits. In the framework of this thesis, benefits and drivers are therefore seen as highly depended on each other. Whereas drivers represent the motives for entering into a collaboration, benefits are perceived as advantages and gains resulting from a collaboration. Both are therefore understood as convincing reasons which are considering the circumstances of industry – university collaborations from different perspectives.

**Why do companies collaborate with universities?**

The research questions of the given thesis are focusing on the evaluation of collaborative research projects from industry as well as university perspective. It is therefore necessary to
discuss the drivers for collaboration from the companies’ and the universities' points of view. In this context, the driving forces which convince companies to become involved into collaborative research with universities are elaborated. Within the framework of their research paper, with the title “How should firms evaluate success in university-industry alliances? A performance measurement system”, Perkmann et al. (2011) pointed out that firms engage in collaboration for four main reasons.

Firstly, a significant driver of collaborations from a company’s perspective is that firms are aiming to leverage their Research and Development (R&D) funding (Perkmann et al., 2011). Especially the government often funds research activities conducted within the scope of industry-university collaborations (Grimaldi & von Tunzelmann, 2002). According to Perkmann et al. (2011, p. 202), public programs which are funding scientific research, “encourage or even stipulate a contribution from industry”.

Secondly, firms are highly interested in getting access to scientific knowledge. While collaborating with universities companies are gaining insights into emerging technologies and they are able to participate in novel scientific debates. As Perkmann et al. (2011) state, firms get an important benefit when they are keeping up to date with public science research. According to the researchers, this is especially important in rapidly changing innovation environments.

Thirdly, firms are aiming to improve their problem-solving capabilities through university advice and assistance. Due to the fact that academic researchers are “enlisted to solve problems, run tests, participate in development work and provide feedback on intermediate outputs” (Mansfield, 1995, cited in Perkmann et al., 2011, p. 204), firms expect universities to contribute to project completion than simply suggesting new project concepts. (Cohen et al., 2002). Most recently, collaborating with universities “results in generic benefits beyond the narrow objectives of specific alliances” (Perkmann et al., 2011, p. 204). In order to develop new technologies, industries fall back on the university sector as it is a source of new techniques and instruments.

Fourthly, university alliances enable companies to screen potential recruits. The collaboration also increases the reputation of the company which leads to an increase of attractiveness of firms as employers. These alliances enable firms to network within a specific scientific area, by offering new opportunities for involving academics as research consultants (Perkmann & Walsh, 2008). The following listed benefits, companies expect to perceive from collaborations, established by Grimaldi and von Tunzelmann (2002), outline and summarize the four already mentioned drivers:

- economies of scale;
- reduction of process and product costs;
- access to research know-how and technologies;
- technology and knowledge transfer;
- potential hiring of graduates or students;
- enhancement of reputation (Perkmann et al., 2011).
The benefits and drivers of university collaborations for industry parties differ across sectors. Whereas some firms are interested in a wider range of benefits, such as basic research efforts and problem-solving activities, other firms have a special interest in sharing R&D costs with universities (Cohen et al., 2002; Perkmann et al., 2011). Additionally, firms' perceptions of benefits can also vary according to the organizations size. As Perkmann and Walsh (2008) state, large companies have less need for problem-solving capabilities than smaller firms, since smaller firms' innovation processes are often depended on information provided by external sources due to high fixed costs of specialist expertise and equipment. Nevertheless, motivations and drivers of companies to engage in university collaboration can vary and frequently overlap, wherefore the objectives of these alliances from companies’ perspectives may be multiple (Perkmann et al., 2011).

**Why do universities collaborate with companies?**

From the universities’ point of view, the interaction with companies is seen as an opportunity to come into contact with lifelike practical problems which build a basis for further research. Nowadays academic institutions “are experiencing a transformation by broadening their traditional mission of teaching, research and public service towards a more active participation in their region’s economic development” (Grimaldi & von Tunzelmann, 2002, p. 167). Patentable inventions, discoveries, faculty spin-off ventures and technology transfer are some substantial contributions universities can offer local economies (Grimaldi & Grandi, 2001). Universities are attributing the following benefits to industry-collaboration:

- research success through publications and patents;
- experience of industrial applications;
- laboratory equipment funding;
- job prospects for academics and students;
- becoming a member of international R&D programmes;
- Founding of academic spin-off companies;
- Reputation (Grimaldi & von Tunzelmann, 2002).

**Industry-University Relationship Framework**

Santoro and Chakrabarti (2001, p. 158) observed that “industrial firms and universities work together in a variety of intertwined ways to advance both knowledge and new technologies”, this is consistent with previous studies by the National Science Foundation. Based on previous research findings, the scientists broached the issue of four highly related components which are encompassed by industry – university relationships. Thus, the dimensions of industry – university interaction can mainly be defined into four categories which are highly intertwined:

- research support;
- cooperative research;
- knowledge transfer;
- technology transfer (Santoro & Chakrabarti, 2001).
Research support is “the contribution of both money and equipment made to universities by industry” (Santoro & Chakrabarti, 2001, p. 158). Research support could be conducted in monetary form or in the form of unrestricted gifts. Fundings are extremely valuable since universities can decide flexible about the application (Reams, 1986). Whereas in the past the industry often provided large amounts of unrestricted funds and equipment, nowadays industry support is often targeted and limited to a specific research project (Santoro & Chakrabarti, 2001).

Cooperative research represents “close interactions through institutional agreements, group arrangements, use of institutional facilities, and informal interactions” (National Science Foundation, 1982, cited in Santoro & Chakrabarti, 2001, p. 158). The most frequently used institutional agreement is contract research which is conducted by an individual university investigator. This means that one member of the university works together with a single firm on a specific research project. Group arrangements could be research projects which involve frequent contacts between organization members and the university’s staff and students. A use of institutional facilities is attributable to the fact that industrial partners are highly interested in coordinated research agenda and state-of the art equipment and facilities. These industry–university partnerships generally occur in specialized areas, in order to increase knowledge and resources by exchanging university research output and industrial experience. The increased interaction of both parties allows the industry to benefit from outsourced activities and enables the university to generate new knowledge which verifies previous research work (Dooley & Kirk, 2007). In general, it can be said, that cooperative research is mainly conducted in informal ways (Santoro & Chakrabarti, 2001).

Knowledge transfer includes different activities which are defined by personal interactions between industry and university members (Santoro & Chakrabarti, 2001). It is about cooperative education programs, internships and job placements. Concrete examples for knowledge transfer are industry-university research programs or joint ventures (Rea et al., 1997).

Technology transfer mainly focuses on the advancement of new technologies. Common technology transfer activities include the addressing of specific research problems, the provision of technical expertise to companies which are aiming to develop new products or processes as well as the provision of technology patent or licensing services (Santoro & Chakrabarti, 2001).

Industry–University Champions
The establishment of a successful industry-university collaboration presupposes the identification of potential partners. Afterwards it is about developing an appropriate collaborative agenda and ensuring that the results are beneficial solutions for all targeted areas. In order to ensure that these goals are fulfilled and pursued as successful as possible, Betts and Santoro (2011) state that an empowered and influential individual, or champion is supposed to be selected. The so-called champion is responsible for boundary spanning activities (Betts & Santoro, 2011). As Betts & Santoro (2011) explain in depth, the value of champions has long been an important factor in the area of industry-university collaborations. The researchers refer
to the studies of Gerwin et al. (1992) as well as Van Dierdonck, Debackere and Engelen (1990) who found out that “champions are an important facilitating factor in industry – university relationships because champions often provide needed control and governance (Betts & Santoro, 2011, p. 23). According to the fact that previous literature is persuaded about the importance of champions, Betts and Santoro (2011) are working out how champions are aiming to accomplish control and governance. Therefore, the researchers are following research done by Ancona and Caldwell (1990) by believing that “effective industry – university champions serve a number of diverse roles” (Betts & Santoro, 2011, p. 23). First, Betts and Santoro (2011, p.23) state that champions can be seen as scouts who are looking for information about potential collaboration partners. Second, champions are comparable with an ambassador, who is “responsible for establishing and sustaining good relations”. Third, champions are monitoring activities between company and university. Finally, champions are guards who protect and prevent negative internal and external threats in order to pave the way a good relationship (Betts & Santoro, 2011, p. 23).

According to Kotnour and Buckingham (2001) a successful industry – university relationship must cover a research field that is really needed by the industry. They additionally point out, that industry must utilize the research capabilities that universities hold. It is a gap which needs to be bridged by the champions, explains Betts and Santoro (2011) based on the research findings of Ancona and Caldwell (1990). Champions are the key figures that develop a good interpersonal relationship between both organizations. They are guards who provide guidance and direction in all stages of the industry – university collaboration (Betts & Santoro, 2011). Champions “must be technologically knowledgeable, spontaneous in response to fluid market dynamics and protective of their organization’s needs and interests” (Betts & Santoro, 2011, p. 23). Also, the philosophical and cultural differences that exist between universities and industry need to be handled sensitively (Betts & Santoro, 2011; Santoro & Chakrabarti, 2002)

Santoro and Chakrabarti (2002) discovered that champions at industrial organizations are more important for the knowledge transfer, technology transfer, cooperative research, and research support within industry-university activities than champions belonging to the university. Santoro and Chakrabarti’s (2002) findings can be explained by the fact that industry champions are seen as more influential in industry-university relationships, because it is often the case that the industrial companies determine the level of resource commitment and involvement within these relationships. This means, that the firms play a major role in advancing the learning and technology outcomes in the initial as well as the continuing stages (Betts & Santoro, 2011).

2.2.3 Challenges and Barriers of Collaborations

Industry – university collaborations are facing significant challenges (Bruneel et al., 2010). While companies are focusing on capturing valuable knowledge that can be applied to create competitive advantage, universities are primarily driven by knowledge creation and education (Bruneel et al., 2010). Perkmann et al. (2011) collected a set of challenges within industry – university collaborations by pointing out which barriers challenges need to be overcome in order to achieve a successful industry – university alliance. In order to do so, Perkmann et al. (2011, p. 205) point out that one has to discuss the structural differences between industry and
university. Faculty members are mostly aiming to conduct open science where research results are published. In contrast to that, firms “pursue proprietary strategies that involve secrecy and intellectual property protection”. In addition, science tends to be long-term oriented, whereas companies are more interested in short- and medium-term occurrences. A second set of challenges is related to the organizational restrictions of boundary-spanning activities between industry and university. Rules and regulations, imposed by universities or government funding, can be perceived as effective barrier to establish industry – university collaboration from a company’s perspective. According to a survey of British firms, more than two thirds of the companies perceived the long-term orientation of universities as well as the lack of suitable government programs as considerable barrier. Especially concerns about confidentiality, property rights and technology transfer led to obstacles (Perkmann et al., 2011; Bruneel et al., 2010).

Due to the fact that “relatively few studies have investigated the nature of the barriers and the factors that might mitigate them”, Bruneel et al. (2010, p. 858) examined two types of barriers in order to advance the knowledge in this research area. “The different institutional norms governing public and private knowledge” are according to Bruneel et al. (2010) the core barriers to industry-university collaborations. The first type of barriers is “related to differences in the orientations of industry and university” (p. 858). It can be defined as ‘orientation-related barriers’. In detail, barriers occur in regard to the institutional organization of the parties. Universities concentrate on the development of reliable and public knowledge, which has always been a central success factor to the growth of these organizations. It is about creating economically useful knowledge, wherefore publishing is a very important factor. Bruneel et al. (2010) as well as Dasgupta and David (1994) state that the science system is mainly pushed by internal dynamics and less driven by market transactions. In comparison to the open nature of the science sector, the process of knowledge creation in firms is driven by economic value and competitive advantage (Bruneel et al., 2010). Companies are mainly creating knowledge for private purposes while “openness to external actors is used as a strategic mechanism to gain advantages over competitors” (Bruneel et al., 2010). It can be said that firms treat hide their knowledge, for the purpose of gaining a temporary monopoly position (Bruneel et al., 2010; Dasgupta & David, 1994).

The second type of barriers is related to conflicts over intellectual property (IP) rights, confidentiality as well as university administration. These barriers are described as ‘transaction-related barriers’. According to Bruneel et al. (2010), these transaction-related barriers can be triggered by potential conflicts between firms and universities regarding patent payments or other property rights. The focus of an industry – university project collaboration often lies on the development and commercialization of innovative technologies, patent ownership or licensing. Universities and firms are often competing over the rights of their research outcomes, since each party wants to increase revenues and organizational recognition, as well as to improve their competitive advantage. Universities are often taking the first step by offering IP, patents and licensing policies to industrial partners in order to demonstrate the industrial community that they want to encourage and promote interactions with industry (Betts & Santoro, 2011).
Despite all these barriers and challenges, industry – university collaborations are widespread (Perkmann et al., 2011). Grimaldi and von Tunzelmann (2002) examined how collaboration parties can overcome the barriers to collaboration by analyzing “the degree of matching between the project’s initial objectives and its final achievements” (Perkmann et al., 2011, p. 205; Grimaldi & von Tunzelmann, 2002). Grimaldi and von Tunzelmann (2002) mainly distinguish between direct outcomes and indirect outcomes when it comes to the performance measurement in industry – university alliances. Direct outcomes can be patents or publications, whereas indirect outcomes can include commercial exploitation of results as well as follow-up opportunities (Perkmann et al., 2011). As a matter of course, as Perkmann et al. (2011, p. 205) state, “the match between expected and effective outcomes derives from the subjective judgement of participants”. Nevertheless, the researchers argue that project collaborations are supposed to choose problems that are of interest to industry and university in order to pursue a team-based collaboration (Perkmann et al., 2011). But since project outputs are often assessed as intangible and not amenable to direct measurement, it is about defining measures that evaluate the value of these intangible outputs.

**Factors weakening the barriers to collaboration**

The discussed challenges and barriers can be attenuated on the basis of several conditions. Bruneel et al. (2010) outlined three potential mechanisms to reduce the barriers to industry – university collaboration: *experience of collaboration, breadth of interaction channels and inter-organizational trust*. Betts and Santoro (2011) consider the *value of trust* as well as *communication effectiveness* as important conditions in order to enhance and improve the performance of industry – university relationships. In this case, the researchers mainly focusing on the barriers to collaboration perceived by firms.

**Experience of Collaboration**

In order to successfully work together with universities on project collaborations, companies are supposed to work across organizational boundaries. In order to do so, Bruneel et al. (2010, p. 860) explain that firms have to build “the capabilities to collaborate with partners operating within a different incentive system”. Operating routines and practices have to be established, so that they can be refined and reused in ensuing collaborations. As Bruneel et al. (2010) argue, university collaborations can be seen as activities in which firms undergo a process of development, since firms are learning from experiences which lead to a development of elaborating ways of engaging with the university sector. In general, due to the experience of collaboration, both, academic and industrial partners are learning to share common norms and are developing an understanding for the nature of collaboration and the research process (Bruneel et al., 2010). The researchers therefore found out, that collaboration experience can lower transaction-related barriers to collaboration. This is proved by the fact that firms that used to collaborate in different research projects are more experienced in negotiating about intellectual property (IP) and contracts with universities.

**Geographic Location**

According to Abramo et al. (2011) the geographic location of company and university takes on an important role when it comes to the capability of collaborations. Due to the costs associated with the geographic distance can be seen as determining factor. Lee and Mansfield (1996) and
Lindelof and Lofsten (2004) explain, that especially for new technology-based firms, the proximity to a university favors information and idea exchanges realized through formal or informal networks. As Katz (1994) states, the number of collaboration decreases with the increase of distance between the two collaboration partners. It has been shown, that a concentration of firms with different institutional backgrounds, but still of the same sector, in one geographical area facilitates good knowledge transfer among the involved parties and leads to innovation and economic growth (Abramo et al., 2011). The Triple-Helix Model by Etzkowitz and Leydesdorff (1997) confirms these findings by representing close interaction between spheres of companies, industry and government institutions as an ideal method for increasing innovation and regional development (Abramo et al., 2011).

Inter-organizational Communication
Bruneel et al. (2010) pay attention to the communication procedure between industry and universities. In this regard they state, that a broad range of interaction channels create new opportunities for organizational learning. In this case, the term ‘interaction channels’ can be understood as different touch points, where both parties are getting in touch with each other in order to organize and process the collaboration. According to Bruneel et al. (2010) these can be formalized and non-formalized interactions, face-to-face and arm’s length interactions as well as short-targeted and long-term interactions. However, even though the increased breadth of interaction can mitigate orientation-related barriers, different interaction channels can lead to increased transactional conflicts as well. Firms have to be aware of the fact that the more parts of the university are engaged in the relationship, the more potential for an increased level of administration procedures and rules may arise (Bruneel et al., 2010).

Betts and Santoro (2011) reflect upon the communication aspect of industry – university collaborations in a more general way by focusing on the effectiveness of communication rather than on the communication channels itself. Generally speaking, it can be said that during the initial stage, the communication and interaction between participants is more of a formal nature (Betts & Santoro, 2011; Ring & Van De Ven, 1992). But when the relationship matures, both parties get to know more about each other wherefore the interaction becomes more personal. Betts and Santoro (2011) therefore consider the continuing stage of the relationship as more effective in regard to communication. The communication effectiveness, which for example includes feedback, is therefore seen as important factor for the relationship of industrial firm partners and universities.

Trust
Due to the high level of uncertainty within industry – university collaboration, Bruneel et al. (2010) state inter-organizational trust as important precondition in order to reduce the fear of opportunistic behavior of one of the partners. According to the researchers, trust creates confidence and develops a good basis for a fair and consistent collaboration. Since companies and universities are sharing sensitive information and tacit knowledge, a low level of trust can cause lasting damage to the collaboration. In compliance with Ring and Van de Ven (1992), a higher trust level between collaboration partners enables a good social and information exchange which encourages all parties to exchange more data and knowledge. Mayer, Davis and Schoorman (1995), cited in Betts and Santoro (2011, p. 25), support this aspect by defining
‘trust’ as follows: trust is ‘the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party”. Trust is therefore created in the way in which two parties communicate, work and relate to each other (Betts & Santoro, 2011).
2.3 Research about Project Management and Collaboration Evaluation

2.3.1 Industry – University Project Collaboration Evaluation Models

The Project Management Institute defines projects as “temporary organizations, limited by a certain scope, and implemented within a certain amount of time (PMI, 2004 cited in Todorović et al., 2014 p. 1). According to Kerzner (2001), the Project Management Institute (2017) and Aubry et al. (2007) the performance of projects within organizations, as specific business operations, is increasing. An identified reason for this is, that projects can be seen as a tool of organizations as a means of reaching an organization’s strategic plan (PMI, 2004). In addition, the growth of a firm can be associated with its power of constant product innovation and a concurrent reduction of the time to market (Aubry et al., 2007). As a result of this, the number of projects within an organization is rising with a simultaneous enhancement of management complexity (Kerzner, 2001; PMI, 2017; Aubry et al., 2007).

In connection with projects and their increased execution, collaborations are recognized to be an effective vehicle to approach multifaceted issues (Marek et al., 2014; Fontana et al. 2006). Especially activities within industry-university collaborations incremented over the last two decades according to Kauppila et al. (2015), Barnes et al. (2002) and Fontana et al. (2006). As a result of this growth, the demand for methods and frameworks to evaluate the outcomes, outputs and impacts of collaborations between universities and organizations increased (Kauppila et al., 2015). So as both, universities and organizations, perceive the evaluation and performance measurement of their collaborations as vital to establish a knowledge domain, to strengthen future projects, and to become aware of the effects these collaborations left (Linzalone & Schiuma, 2015; Todorović et al., 2014).

Classifying performance measurement and project collaboration evaluation within project management it can be attributable to project quality management (PMI, 2004). This entails the processes that assure the project will fulfil the requirements for which it was conducted (PMI, 2004). Initiatives, within the frame of project quality management which are successfully adopted by many private and public-sector organizations, are self-assessment processes and quality award schemes explored Tari and Madeleine (2011), Ruben et al., (2006), Linzalone and Schiuma (2015) as well as Todorović et al. (2014). These processes are widely named ways in relation to project quality management and collaboration evaluation of industry-university collaborations (Bovaird & Löffler, 2009; Tari & Madeleine, 2011). Looking at organizations, a self-assessment provides an occasion to reflect and create “a common language and analytic framework, establishing improvement priorities, and providing a foundation and impetus for effective strategic planning and organizational change” stated by Ruben et al. (2006). Whereas universities, use more often quality award-based models for the evolution of accrediting standards of professional and technical education and lately in regional accreditation (Ruben et al., 2006). Reviewing literature according to different evaluation models, a large number of researchers and scientists conducted research on this topic representing many different evaluation models through various foci of analysis, ranging from theoretical streams and nature over context scope and approach (Chen, 2005). Irrespective of the focus of the analysis, evaluation as itself is termed to be “the assessment and analysis of the effectiveness of an activity” (Todorović et al., 2014, p. 92). More precisely, evaluations consider, what is scheduled
to do, what has been reached and how it has been reached by Linzalone and Schiuma (2015). Further, Linzalone and Schiuma (2015) expound that, it is the evaluations’ purpose to apply the information gathered out of an evaluation, in order to improve a project and not only to detect and ascertain what happened. To evaluate projects within the frame of collaborations from a higher education institutes (HEIs) point of view, the literature suggests specially created self-assessment models based on quality awards for academia (Tari and Madeleine, 2011; Kumar, 2007; Ruben et al., 2006; Sampaio et al., 2011; Perkmann et al., 2011; Barnes et al., 2002; Iqbal et al., 2011). Independent of the models HEI’s chose, the objective of the process is to detect strengths and areas of improvement as a method of enhancement (Tari and Madeleine, 2011; Kumar, 2007; Ruben et al., 2006; Sampaio et al., 2011; Perkmann et al., 2011; Barnes et al., 2002; Iqbal et al., 2011).

**Frequently used Evaluation Models of Higher Education Institutes**

The most frequently used models are standardized quality award models as Kauppila et al. (2015) state in their research paper within the Tertiary Education and Management Journal. The oldest award model was instituted in 1951 by the Union of Japanese Scientists and Engineers, named Deming Prize (DP) (Kumar, 2007). The prize was handed out to organizations or divisions of organizations which accomplished distinctive performance improvement by the implementation of Total Quality Management (TQM) (Sampaio et al., 2011). Different to other quality awards the Deming Prize does not offer a model framework for organizing and prioritizing criteria (Sampaio et al., 2011). The process of evaluation entails ten equally weighted topics which each candidate must approach, covering these categories: policies, organization, information, standardization, human resources, quality assurance, maintenance, improvement, effects and future plans (Sampaio et al., 2011).

A more modern and framework providing model is the Excellence in Higher Education Model (EHE) established in 1992 as a further contextualization of the Malcom Baldrige National Quality Award model (MBNQA) created in 1987, in the USA. This model is named to be an utterly popular framework for organizational self-assessment (Kumar, 2007; Ruben et al., 2006). The EHE is a framework for universities where the mission usually entails a core theme on scholarship, research and teaching (Ruben et al., 2006). Further the EHE can be used for the assessment and planning of activities of all kinds within colleges and universities with emphasis on teaching and learning outcomes (Ruben et al., 2006). It addresses the following seven different themes: Leadership, strategic planning, beneficiaries and constituencies (stakeholders), programs/services (process effectiveness) and faculty/staff/workplace, assessment and information use (measurement and knowledge utilization), outcomes and achievement (Ruben et al., 2006). The execution of the evaluation with the EHE is mostly conducted within a workshop, composing a step by step assessment process, moving through all categories (Ruben et al., 2006). As a result, the areas that need to be improved are highlighted while for these areas goals and strategies are developed (Ruben et al., 2006). The European counterpart to this model is the European Foundation of Quality Management (EFQM) excellence model established in 1988 which “provides a framework that encourages the cooperation, collaboration and innovation” of over 30.000 organizations in Europe (EFQM, 2018; Sampaio et al., 2011). Moreover, Porter and Tanner (2004) describe the EFMQ as powerful diagnostic tool that provides opportunities for stakeholders to learn and to spot
strengths or determine improvement opportunities. As well as the EHE model, the EFQM is derived from an industry background to a higher education field, with a significant use of higher education institutions (Davies, 2008; Sampaio et al., 2011). This can be referred to the pressure on public institutions to accomplish customers’ requirements through continuous improvement (Sampaio et al., 2011). The EFQM is built on the fundamental concepts of excellence established by the European Foundation of Quality Management (Kauppila et al., 2015). These concepts are then coupled with the evaluation criteria of the model (Kauppila et al., 2015). The nine categories are sub-divided into enablers (leadership, strategy, people, partnerships and processes) and results (people results, customer results, society results and business results), which is based on the idea that the enablers lead and drive the results (Nabitz & Klazinga, 1999). Looking at all of these three models, they are strongly focused on overall organizational excellence and general performance evaluation to improve and create sustainable success and how the application of these models delivers competitive advantage (Sampaio et al., 2011).

**Specific Industry – University Project Collaboration Evaluation Models**

Zooming to industry–university collaborations, Perkmann et al. (2011) and Barnes et al. (2002) state that these alliances differ from other types of alliances across diverse scientific areas relating to their objectives, outputs and organizational set ups. It is a key challenge for the management of universities and organizations to know how to assess and evaluate these alliances, since it is described to be difficult to set clear objectives and to evaluate the outcomes (Perkmann et al., 2011). Four main areas of measurement challenges are identified by Perkmann et al. (2011), the project outputs and outcomes are often intangible as the objectives are more basic and consequently more remote from the design of actual products and processes, which makes this possibly relevant knowledge difficult to quantify. This leads to challenges in defining measures for the value of these intangible outputs. Further measurement challenge are the multiple objectives that differ across the partners relating to time, cost and quality. Connected to this, is the challenge that the benefits of the collaboration may only be realized within a medium or long-term project. Whereas the fourth challenge, captures the problem of measurement norms, so to what should the measures be compared against. Because of these challenges, a purely hard fact-based performance measurement as quantitative case is often not sufficient (Feller et al., 2002). Therefore, the necessity of developing specific performance evaluation models tailored for these collaborations evolved (Todorović et al., 2014; Perkmann et al., 2011; Barnes et al., 2002; Marek et al., 2014; Iqbal et al., 2011). Science perceives it as difficult to judge what framework of evaluation is best to use to compare and analyze a collaboration (Todorović et al., 2014; Perkmann et al., 2011; Barnes et al., 2002; Marek et al., 2014; Iqbal et al., 2011). So as to, it is suggested that “no one approach is best for all situations” (Linzalone & Schiuma, 2015, p. 92). Moreover, the best approach diversifies depending on the factors like the fit to basic values, aim of the evaluation, the structure of key stakeholders and the best disposable resources (Linzalone & Schiuma, 2015).

Comparing different researches, on how the evaluation process and model development for industry–university collaborations has been conducted, to overcome the previously named measurement challenges of these alliances, a certain degree of parallelism emerged: the establishment of critical success factors (CSFs) and success criteria that build a basis for collaboration measurement and evaluation (Todorović et al., 2014; Perkmann et al., 2011;
Barnes et al., 2002; Marek et al., 2014; Iqbal et al., 2011). This can be traced back to the fact, that critical success factors are the factors that are conducive for reaching project success, whereas success criteria are measures defining if a project is successful (Todorović et al., 2014). Further, in order to measure and evaluate, a connection between CSFs and project success measurement needs to be developed (Todorović et al., 2014).

Within the scope of their multi-case evaluation of collaborative industry-university interaction, Barnes et al. (2002) provided a basic framework of success factors leading to a good practice model for successful collaboration for both parties, validated by empirical evidence laid on the case study projects. In addition, the success factors, identified through the analysis of the case studies, are arranged according to key themes guiding to useful insights into areas that need particular attention for successful collaboration, measurement and evaluation. The CSFs that got put forth and are mostly named within the six cases are: trust, commitment, good process monitoring, collaborative experience, corporate stability, clearly defined objectives, clear responsibilities and agreed timescales (Barnes et al., 2002). Considering another research study, that analyzed the major factors of collaboration evaluation, the establishment of success criteria was used as evaluation coefficient. The development of the so called CASEM model, comprising of the parameters: constraints, evaluation metrics, success criteria, tangible outcome and strength of collaboration, led to an evaluation tool that is applicable for all sorts of collaborations between universities and the industry (Iqbal et al., 2011). Further, it gives significant support to abstract success criteria for a number of evaluation metrics (Iqbal et al., 2011). The yield success criteria are: trust, information exchange, strong commitment, similar objectives, strong relationship, number of personal involved and number of previous projects (Iqbal et al., 2011). Marek et al. (2014), published a research paper presenting an investigation of a seven-factor model for effective collaboration going along with the evaluation tool CAT (Collaboration Assessment Tool). This seven-factor model is based on the 20 factors, organized in six categories by Mattessich and Monsey in 2001 (Marek et al., 2014). These following seven factors are identified to be critical for successful collaboration and distinctively contribute to a better understanding of collaborations: context, members, process and organization, communication, function, resources and leadership. As a result of these factors as evaluation coefficient, the CAT provides evaluators “with grounded, reliable, and valid information that can be used to provide feedback to coalitions in an intentional, comprehensive and efficient manner” (Marek et al., 2014, p. 79).

2.4 Theories Used

2.4.1 Stakeholder Theory

The stakeholder theory has been developed over the last 30 years to counter the predominant view of the 1980s, “that social well-being is maximized when shareholder wealth is maximized.” (Lapume et al. 2008, p. 1171). According to it, the corporation’s fundamental obligation is to ensure it survives and thrives while considering and balancing the needs of multiple stakeholders, instead of solely maximizing its financial success. This means in the context of this theory, that organizations must be aware that their decisions and actions can
affect multiple stakeholders, and thus they have a duty to them (Freeman, 1984). Stakeholders are defined as actors that may be influenced, in a beneficial or damaging way, by a company’s actions, especially in regard to social and environmental aspects. There are internal stakeholders, such as employees, as well as external stakeholders, such as customers, suppliers, banks, NGOs, governments, universities and other groups (Freeman, 1984; Lozano et al., 2015). Originally, the stakeholder theory mainly focused on social stakeholders, however, recently more and more authors have addressed environmental matters, such as environmental management, environmental regulation and protection of the natural environment (Lozano et al., 2015). Céspedes-Lorente et al. (2004) for instance suggested four directions of research within stakeholder theory to approach natural environment:

- the role of external stakeholders in assessing environmental performance and corporate environmental risks;
- the importance of pressure for environmental reporting practices and communication;
- the influence of stakeholders on the environmental strategy of firms and
- the development of environmental cooperation between the firm and its diverse stakeholders (Lozano et al., 2015).

Concluding, stakeholder theory can explain why organizations engage in sustainability actions and shows that firms “doing good” within social or environmental aspects have better stakeholder relations as a consequence (Hillman & Keim, 2001). Moreover, it provides managers with a deeper understanding on how to engage with different stakeholder groups that are influenced or influence the company (Lozano et al., 2015). However, despite the fact that this theory includes the economic, environmental, and social dimension of sustainability, it is limited since it does not include the time dimension. It is not specified how to deal with changes over time in the environment in which the company operates (Lozano et al., 2015).

2.4.2 Resource Dependence Theory

Resource Dependence Theory (RDT) has received great attention in the strategic management literature and has become one of the dominant theoretical foundations for the reason firms engage in mergers (Hillman, 2009). RDT aims to explain from an external focused perspective why firms approach other organizations (Haleblian et al., 2009). According to this RDT viewpoint, firms are characterized in terms of their dependence on other organizations for various resources necessary for organizational success and existence (Pfeffer & Salancik, 1978). Those resources comprise internal and external resources. External resources, are resources which are not influenced by an organization, including the production processes, external links of organization and organizational behavior (Nemati et al., 2010). Internal resources, which are being influenced by an organization, include human capital resources, financial resources, technology, plant and equipment, innovative abilities and internal processes systems, all of which are directly under the control of an organization that can influence it (Nemati et al., 2010). Lambell (2008, p. 80) says, especially “When a particular resource is critical to an organization’s survival or success, the organization is likely to attempt to either control it or co-operate with organizations that can provide it or regulate its provision.” Also, Liu and Chang (2012) state that the theory proposes that actors lacking in necessary resources
will aim to form relationships with others in order to obtain needed resources. The authors describe this merge for resource exchange as a set of power relations. Further, they say organizations are viewed as coalitions changing their structure and behavior to obtain and maintain needed external resources (Liu & Chang, 2012). Also, because the survival of organizations often depends on legislation, many firms partner with other organizations, NGOs, governments, HEIs etc. to influence legislation so that it has a less uncertain and harmful effect on the organization. Thus, partnerships can help organizations to reduce environmental uncertainty and ensure access to important resources (Gray & Stites, 2013).

2.4.3 Two Tiered Sustainability Equilibrium

Since the introduction of the concept of sustainable development in 1974 (Dresdner, 2002) there have been developed many definitions, models and viewpoints regarding sustainable development to make the concept more tangible and thus implementable. This is due to the fact that the concept of sustainability has been criticized to be “empty” and “lack[ing] of substance” as well as a general definition (Fortune & Hughes 1997). One widely spread approach to explain the concept of sustainable development in the context of corporations, is the triple bottom line (Elkington, 1998). The triple bottom line describes the managerial goal to consider social and environmental aspects besides economic success (Elkington, 1998). However, it is argued that the triple bottom line is lacking an important dimension: time (Lozano, 2008). Therefore, Lozano (2008) has developed the Two Tiered Sustainability Equilibrium (TTSE) which extends the interaction of the three dimensions of the triple bottom line by the dynamics of these dimensions over time. According to Amini and Bienstock (2014) the TTSE “effectively incorporates the tension, not only among economic, social, and environmental concerns, but across short and long-term perspectives”. Lozano (2008) describes this approach thus as “the holistic perspective”. How the TTSE is illustrated is shown in figure 2.

Figure 2 Two Tiered Sustainability Equilibria (TTSE) (Lozano, 2008, p. 1844)

In the first step, the *First Tier Sustainability Equilibrium* the interactions of the three dimensions economic, environmental, and social, at a single pint of time (usually the present) are presented. Hereby each dimension is interrelated with every part of the other two dimensions, which is why the dimensions are presented as three circles, which should, according to the author, overlap fully, for real sustainability (Lozano, 2008). However, when
only considering the first stage, most emphasis is put on the present, while little or no attention is paid to the needs of tomorrow (Lozano, 2008). Within the second stage, the model is further evolved to address intergenerational issues (Moir & Carter, 2012). Consequently, a time dimension is added, which is illustrated by a three-dimensional cone, whereby the wider side is in the present. The visualization of the fourth dimension. The final step encompasses the interactions of both equilibria into a Two Tiered Sustainability Equilibria. This is illustrated as a geometric torus (see figure 2), where “sustainability issues lie inside the [torus] and are in perennial movement inter-relating with other issues, continuously rotating in [...] two axes” (Lozano 2008, p. 1844). Therefore, the FTSE interrelates through time, so a dynamic change process occurs. This means that the FTSE may not be the same situation in the present and in the future (Lozano, 2008). Lozano states that in the final TTSE model, all four aspects interrelate, which makes the economic aspects of today interact with the economic aspects of the future, as well as with the environmental aspects of today and the future, and also with the social aspects of the today and the future (Lozano, 2008).

2.4.4 The Triple Helix Model of Innovation

In the framework of new knowledge creation Gibbons et al. (1994) developed the term *Mode 2* that describes a “new mode of the production of scientific knowledge” (p. 62). *Mode 1* initially describes the traditional way of science, which distinguishes clearly between scientific actors and social actors, the further developed *Mode 2* describes the new global, problem oriented, context-driven, interdisciplinary way of scientific work (Gibbons et al., 1994). The authors argue, that the growing international competition leads to an increase in cooperation, whereby market, society and stakeholders are involved into the knowledge production process (Pohl, 2008; Gibbons et al., 1994). This new way of knowledge production is supposed to be relevant more for society than only for science (Gibbons et al., 1994).

The Triple-Helix Model (THM), which has been first suggested by Etzkowitz and Leydesdorff (1997), represents a model at the level of social structure and can be an explanation of the theory of *Mode 2* (Etzkowitz & Leydesdorff, 2000). It visualizes interactions between helixes, in the case of industry-university-government relations, within the context of innovation development and promotion (Rodrigues & Melo, 2013; Roque de Almeida et al., 2012). According to Rodrigues and Melo (2013, p. 1675) the model “has a prominent position in the study of the role that higher education organizations play in the so-called knowledge economy”. It is a linear model of innovation that depicts a new social contract between universities and the larger society, by assuming that the contribution of academic research to the economy can be seen as a long-term and short-term contribution (Rodrigues & Melo, 2013). A circulation between the three spheres, industry, university and government, “facilitates knowledge fluxes continuously and contributes to more fluid innovation dynamics” (Roque de Almeida et al., 2012). Due to the increased relevance of the Triple-Helix Model, universities are playing a greater role in the innovation system by interacting with industry (Dooley & Kirk, 2007). In this context, the model states that universities especially take on an important role in social and economic development (Etzkowitz, 2002, cited in Roque de Almeida et al., 2012). The innovation activity of universities improves the development of the local and national economy and provides researchers with financial benefits (Leydesdorff & Etzkowitz, 1996). The increased importance
of universities in terms of economic development has led to closer interaction between academic and industrial institutions (Dooley & Kirk, 2007).

According to Etzkowitz (2011), the triple-helix of industry-university-government relations has four levels of dimension. The objective of all four levels is the enhancement of dynamics for innovation in a knowledge-based economy. The first level is internal transformation in each of the three helices. It addresses for instance universities creating a new mode of knowledge production by not only doing research but also capitalizing the produced knowledge. Furthermore, internal transformation appears when firms are developing ties with other companies by forming strategic alliances. The second level is the influence one helix has upon another. An example for this could be the role of the government formulating policies and programs to encourage universities to collaborate with industry (Etzkowitz, 2011). The third dimension of the triple-helix is the creation of networks and organizations due to an interaction among the three helices. New institutional structures are generated because firms, universities as well as regional and national government are coming together in order to develop new ideas and by using high-tech development to fill gaps in the innovation systems (Rodrigues & Melo, 2013). The fourth level stands for entrepreneurial dynamic which is inspired by interactions among the triple helix. It is about strengthening entrepreneurial science in order to enhance dynamics for innovation (Etzkowitz, 2011). According to Rodrigues and Melo (2013) and Etzkowitz (2011), the Triple-Helix Model has become a platform for institution formations. The interaction between university, industry and government can initiate new formats of organization such as science parks. In this context, the Triple-Helix Model argues that the university is taking in a strong position as leading institutional sphere, along with industry and government (Rodrigues & Melo, 2013).

The Triple-Helix Model provides a solid fundament for the given research purpose of this thesis. It emphasizes the importance and relevance of the chosen research topic and clarifies the interplay and interaction between all parties of industry – university collaboration. Due to the fact that the commitment of universities within collaborations is commonly funded by local or national government, the chosen research approach is mainly focusing on the interactions between academia and industry. These two actors are handling all elementary communication and implementation processes, wherefore they are representing the central point of the given investigation.

2.4.5 Industry-University Collaboration Evaluation Model

The framework and good practice model of Barnes et al. (2002) is detected to be the best qualified theoretical basis for the project evaluation within this research paper, according to the results of the literature review. Therefore, the presented concept builds the foundation of the empirical research conducted. The following chapter will provide further evidence for choosing this framework as appropriate theoretical guide next to an overall understanding of this concept.

Based on the fact that collaborations between the industry and universities are perceived to be an increasing enrichment for both parties, a growing world-wide trend for stronger alliances between academia and industry is noted (Barnes et al., 2002). Nevertheless, these possible
benefits, explained in chapter 2.2.2 are often not able to be fully achieved since organizations naturally differ. Therefore, significant management effort is needed to reach their goals and targets. Next to the benefits and potential positive outcomes of collaborations the substantial investment in terms of time, costs and resources, collaborations require an effective management to achieve the maximum outcome, stated Barnes et al. (2002). Having this challenge in mind, six different industry – university collaborations are analyzed with the objective to identify factors that are perceived to “increase the probability of a collaboration being successful for both, academic and industrial partners” (Barnes et al., 2002, p. 272). Since six different cases within the field of industry-university research and development collaborations were analyzed, they deliver a good multifaceted foundation of theory is delivered. Further, the balance of analyzing both partners offers the opportunity to gain insights into both sides resulting in possible solutions for problems that the university as well as the industry experienced while collaborating (Barnes et al., 2002). As outlined in the literature review, the intangible outcomes of such collaborations are often described as difficult to measure, leading to the cognition of failure. Because this is likely to impair the willingness for future collaborations, Barnes et al. (2002) justify their focus on the perceptions of key participants accordingly and therefore consider these subjective views as worthy for additional research.

As a result of interviews with key participants from both partners and supplementary project documentation material, all factors, noticed as significant consequence of collaboration success, are listed. Through the identification of patterns, key themes are established including factors that have been named as positive or negative indicators, leading to an overview of the most stated terms in the field of: universal factors, choice of partner, project management, environmental factors/ outcomes and cultural issues (Barnes et al., 2002).

The table (App. 1) highlights the factors having the highest consensus across all six projects, proved by literature and conducted case study analysis of Barnes et al. (2002). Starting with the first theme, which are the universal factors, commitment and trust are the most occurred success factors across all projects within this theme (Barnes et al., 2002). The matter of trust is seen as indicator for continuous information flow between the partners, which is likely to support further collaboration between partners. In addition, prior experience of working together can be seen as equally important to collaboration success than prior collaborative experience (Barnes et al., 2002). Further, it is especially up to the project manager to encourage the development and maintenance of trust by taking actions to foster these conditions (Barnes et al., 2002).

Within the theme, choice of partners, the main factors emerged to be complementary aims and complementary experience. Especially complementary experience, in regard to the universities’ supporting role in expertise and specific research, is preferred by the industry partners leading to the likelihood of a reduced degree of involvement by the industry partners (Barnes et al., 2002). At this stage also, negative impacts of hidden agendas are named (Barnes et al., 2002). Project management and project manager is the theme where Barnes et al. (2002) recognized the greatest number of success factors. Particularly outstanding are the factors of clear responsibilities and objectives as identified in four of the six projects (Barnes et al., 2002). In the context of industry – university collaborations setting clear objectives is detected to be
crucial to protect the collaboration from unrealistic expectations or misinterpretations. Moreover, Barnes et al. (2002) mention clear responsibilities with a steady number of people lead to a clear allocation of tasks and a structured project execution. Next to this, process monitoring, project planning and effective communication were also revealed by the data (Barnes et al., 2002). As an indicator for ensuring quality and outcomes, cooperate stability is discovered by the researchers as main factor for this. The last preeminent factor that reached full equality across all projects is agreed timescales within the theme of cultural issues (Barnes et al., 2002).

As a result of the analysis of the six different project cases, Barnes et al. (2002) come to the conclusion that “while there are similarities between projects on a number of levels, the overall pattern of success factors in each case is markedly different.” (Barnes et al., 2002, p. 274). This leads to the rationale that the success of a collaboration including a project is highly influenced by a complex correlation of factors as well as the accumulative consequence of positive and negative effects from these factors (Barnes et al., 2002). In addition, due to the individual circumstances of each project, it cannot be generalized that specific factors are self-evidently leading to a project's success or directly resulting into failure (Barnes et al., 2002). However, due to the fact that a number of factors across all projects are identified simultaneously, Barnes et al. (2002) infer that this could indicate a common problem area within this type of collaborations. Therefore, in respect of a good practice in management of industry – university collaborations a particular emphasis should be put on such factors (Barnes et al., 2002).

As a consequence of the success factors Barnes et al. (2002) identified out of their cross case analysis, a good practice model for industry-university collaborations and vice versa is established based on the main findings outlined previously in this section (App. 3). The model displays the themes and categories developed in the overview of Appendix 1 with the specific factors relevant for each theme and how they are affecting each other. Due to the in-depth analysis and applicability for both parties, this model is used as guiding theory for the good practice model presented within the discussion of this thesis.
3. Methodology

This chapter exemplifies the applied research method with regards to the theoretical and empirical research approaches of this investigation. It starts with a structural research overview to provide the reader an overall understanding of the following in detail explained sub-sections.

3.1 Research Structure

![Figure 3 Overview of the Research Structure (Own Illustration)](image)

The structure within this research is based on the flow chart provided above. First, a comprehensive literature review is conducted to build a clearer picture of the area of research. Through this, the gap and thus the purpose and resulting research questions are developed. In accordance with, the theories supporting the purpose as well as the answering of the research questions were chosen. While generating empirical data to be able to draw conclusions on the risen research questions by semi-structured interviews, endorsement for the chosen theory is given. This is followed by an analysis and evaluation of the gathered data, including a consideration and sense-making leading to an explanation of the research question. Moreover, through aligning theory and empirical data a synergic effect emerged, where lacks in theory are answered by the provided data of the interviews conducted.

3.2 Choice of the Research Question

The choice of the research question determines the focus of this investigation, also it directs the selection of methodology, the chosen theories and moreover the analytical part of this research, including the collection of data and the analysis. According to Saunders et al. (2009) the research question is the key question which the research process will address, in addition, it
provides structure to the investigation and keeps the research on the "right track" (Bryman & Bell, 2011). Within this study, two types of questions are used, how and what-questions. The overall research question is formalized as how-question supported by another one of this type and two what-questions to increase the understanding and results generated. Both types of questions are leading to a specification within the answer, whereas what-questions initiate to describe a phenomenon and how-questions can be used for developing a good practice (Bryman, 2012). Consequently, a what-question is used to identify drivers of industry and university for such collaborations and to get to know the factors that need to be considered when evaluating these projects. Whereas how-questions are applied to understand how the potential beneficial impact of industry-university collaborations within strategic sustainable management can be released and how the projects influence strategic sustainable development.

3.3 Research Methods

Choice of Empirical Data
With the aim to produce knowledge and insights about the central topic within this research, primary and secondary empirical data collected in the form of qualitative data collection methods are applied. Therefore, data in written and spoken language is gleaned in order to answer the research question. With the former, documents such as project reports and feasibility studies of the projects are consulted. The latter refers to the semi-interviews conducted in an interpersonal way. Since qualitative research pays more attention to the depth of knowledge produced, a deeper insight into the subject matter is accessible and can be achieved in doing so (Eriksson & Kovalainen, 2015). As a result of this, the primary and secondary data collected within this research, build the basis for understanding how the potential beneficial impact of industry-university collaborations on strategic sustainable development can be released.

Research Design
It is the purpose of this passage, to describe the methods and framework for the collection and analysis of the data, captured within this research (Bryman & Bell, 2011). This research follows a qualitative research approach to accomplish knowledge about the project collaboration management and about how the potential beneficial impact of industry-university collaborations promoting strategic sustainable management can be released for both, the industry and the university. The decision is based on a statement by Bryman (2012) supported by O’Gorman and Macintosh (2014) who state that qualitative research allows the researcher to seek for “understanding of behavior, values, beliefs” as well as to gather “rich data” in a contextual approach (Bryman, 2012, p. 408). Therefore, the selection of a qualitative research approach encourages the detection of the research participants’ focus and helps to understand the deeper meaning of their perspectives (O’Gorman & Macintosh, 2014). Since this research is focused on the perceptions of the interviewees regarding the collaboration management, a qualitative research approach turned out to be appropriate for this investigation.

The chosen theory for this investigation is selected according to the literature review, its applicability to the given cases, perspectives generated from conducted interviews and the research purpose. Thus, an abductive reasoning approach is used which allows understand the
interviewees’ worldview and to draw conclusions from “thinking from evidence to explanation” (Bryman, 2012; Aliseda, 2006, p.28). This is based on the statement of Aliseda (2006) which says that abductive reasoning “invoked to explain a puzzling observation” and abduction “grounds social scientific accounts of social worlds in the perspectives and meanings of participants in those social worlds” (Aliseda, 2006, p. 28; Bryman, 2012, p. 709). As a consequence, the theories which promised to be the best suiting analytical tools for this investigation are applied to the empirical data within the analysis. As a result of this, the empirical data obtained from interviews also influence the interpretation of the chosen theories. In order to investigate the particular contemporary phenomenon of the potential beneficial impact of industry-university collaborations on strategic sustainable development within its real-life context, a case study design with multiple sources of evidence is selected (Saunders et al., 2009).

**Interviews**

This section reflects upon the technique the interviews within this research are conducted in order to generate empirical data. Semi-structured interviews are chosen for this qualitative research, because of the less standardized nature and reference to qualitative research. Also, the data gathered by this type of interview is normally analyzed qualitatively (Saunders et al., 2009). Further, the characteristic of semi-structured interviews, to have more general questions and a list of specific topics that are aimed to be covered during the interview are deemed best. This is due to the fact that, three researchers are involved in this research and interviewees with different not directly comparable backgrounds are interviewed (Bryman & Bell, 2011). In addition, the option to omit or add some questions in particular interviews, and the possible variation of the order of the questions depending on the interview flow, delivers an adequate solution for the given research circumstances (Saunders et al., 2009). Therefore, the choice of semi structured interviews, facilitates to prepare topics and questions ahead of time, without reducing the advantage of flexible questions while prohibiting a fixed range of answers for the interviewee (Bryman & Bell, 2011). Based on the given characteristics of semi structured interviews, this approach enables a fluent exchange of information and knowledge between the researchers and the sources (Eriksson & Kovalainen, 2010). According to Saunders et al. (2009), this “nature of questions and the subsequent discussion mean that data will be recorded by audio”. The interviews within this research are conducted via phone and recorded through an app or held in person and recorded by a memo app. The following list provides an overview about the companies and participants interviewed.

Due to the case study approach including real companies and cases, the given projects and names have been anonymized. The aim was to interview an equal number of participants per company. However, not every potential interviewee was available during the time the interviews were planned. Therefore, the viewpoint of some companies is only represented by one interview participant.
Selection of primary data

The primary data used for this investigation is collected through the industry contact persons provided by the university. Through the allocation of email addresses, it is possible to contact the informants directly with a request for a research orientated interview. The selected persons are directly involved and have influence on the execution and management of the project collaborations. With regards to creating the most possible variety and in-depth understanding of each case, seven different collaboration partners within three different projects with similar research topics are chosen as interviewees. The statement of having the most possible variety though the selected partners, is based on the fact that, each interviewee has different positions and represented a different industry sector. For instance, one interviewee provides the angle of IT support, another one is a company representative for sustainable management, also a project manager from the university side is included. Therefore, all sources added first-hand knowledge and perceptions about the drivers, which help to find out, how these projects influence the strategic sustainable development as well as what are the critical success factors for both parties in order to successfully collaborate.

Interview Guide

The following paragraph outlines the preparation process for the interviews and the simultaneous design of the interview guide. As the key for successful interviews is stated by Saunders et al. (2009), which is careful preparation, the 5-Ps mantra of “prior planning prevents poor performance” is taken as a superior theme for the interviews within this research. This accompanies a precise planning of how to demonstrate credibility and confidence to the interviewees (Saunders et al., 2009). As a starting point for the design of the interview guide, the definition of Bryman (2012) for an interview guide is taken as a theoretical basis to build upon. Corresponding to Bryman (2012), an interview guide represents “a list of questions or fairly specific topics to be covered” (p. 471). Moreover, the puzzling issue for each research question is taken into consideration. In order to probe the causes of this puzzling issues, the chosen theoretical framework is consulted. For instance, to investigate how the project collaborations can be evaluated, questions connected to each critical success factor produced by Barnes et al. (2002) were prepared. As a consequence, all questions are developed and formulated related on the chosen theory and have a focus on what is needed to know to be able to answer the set research questions. In doing so, it is crucial to detect the position and focal issue of the interviewee in relation to the research question. This means for example, questions related to the industry side are changed into questions for the position of the university. As a result of this, a reasonable amount and order of questions are created, but prepared ourselves simultaneously to change the order of them during the interview (Bryman, 2012). Lastly, information and knowledge acquired during interviews had influence on subsequent interviews.
Processing of Primary Empirical Data

This section describes the processing and coding of the primary data, to justify the choices made for the analysis. The interviews are conducted in English with all research participants. As this is either the native language of the interviewers, nor of the interviewees, all participants are faced with potential language barriers. In the next step to ensure a high knowledge transfer, the recorded interviews are transcribed. This is done due to the fact that this qualitative research is not only interested in what the interviewees say, but also in the way they say it (Bryman, 2012). Further, it supports eliminating the natural limitations of memory and facilitates a deeper examination of the interviewees’ statements (Bryman, 2012). In order to structure and portion the large amount of data gathered through conducted interviews, the process of coding is consulted (Sang & Sitko, 2015). The codes are developed according to a template discussion, which allows both a priori and posteriori coding. Hereby codes were derived from the literature, the underlying theoretical framework and the data itself (Sang & Sitko, 2015). In doing so, the interviews are analyzed regarding frequently used words and phrases within specific topics. This resulted into the focus areas of sustainability-oriented innovation as an experiment for future implementation, differences between the different business approaches of industry and university, synergic effects of industry-university collaborations as well as teamwork, necessity of evaluation and funding. By means of grouping words and phrases into focus areas, their correspondence to the research questions emerge.

3.4 Assessment of Research

In order to produce scientific applicable knowledge, quality criteria have to be considered. Bryman (2011) states, according to Lincoln and Guba (1985; 1994), that qualitative research requires a different approach for judging and evaluating the quality of qualitative research. As it is argued, that there are no absolute truths within the social world, which means that there can be more than a single, potentially several accounts (Bryman, 2011). As alternative criteria for reliability and validity, trustworthiness and authenticity are proposed. Trustworthiness can be processed by the following criteria:

- credibility, this indicator parallels internal validity;
- transferability, this indicator parallels external validity;
- dependability, this indicator parallels reliability;
- confirmability, this indicator parallels objectivity (Bryman, 2011).

In order to establish credibility, respondent validation is consulted as an appropriate technique. Data interpretations and conclusions are shared with the research participants. This allows participants to correct errors and provide additional information. The transferability is limited due to the observation of organizations only within the fashion sector. Therefore, the findings cannot directly be transferred to other industries. However, in order to obtain a level of transferability as high as possible, the findings are summarized in a good practice model, independent from the considered cases. The measure of the anonymization of the interview participants, are initiated in order to increase dependability. This ensures that the interviewees
are not influenced by the pressure of not exposing their company. Therefore, it can be assumed that the interviewees answered based on facts and data, without being biased. To verify that the findings can be attributed to the interviewees rather than to the researchers, a detailed description of the research process is outlined. Thus, confirmability is ensured.

*Ethical Considerations*

Due to the fact that this research involves human participants in the conducted interviews, it is made sure that this research meets ethical principles. In doing so, Bryman and Bell (2011) suggest considering four main areas in business research. Firstly, there should be no harm to the participants with regards to stress, physical harm or harm that compromises the participant’s self-esteem. Further, this research should not affect the participants’ future career or current employment. Secondly, it should be guaranteed that the research participants are comprehensively informed to make profound decisions about whether or not they want to take part in the research. Thirdly, the prevention of an invasion of privacy should be kept in mind during the interaction with research participants. Fourthly, the topic and status of the research needs to be communicated unequivocal, true and correct, to avoid the occurrence of deception.

To meet the first and third ethical principle, all interviews are either conducted in an isolated room or via phone with emphasis on starting each interview with informing the interviewee about the fact that all interviews, data and information are treated anonymously and only used for this study. Any particular personal information that could compromise the self-esteem or affect the career of the participants was not asked. A detailed e-mail with information about the research that is conducted, and the required empirical data is sent out prior the interviews, to enable the candidate for a profound decision about whether or not he/she wants to take part in the research. In addition, each interview is also started with a clear statement of the status quo of the research. This is undertaken to meet the second and fourth principle of Bryman and Bell (2011).
4. Results & Linkage with Theory

In the subsequent section, the empirical findings of the conducted interviews are outlined and linked with previous literature and used theory.

4.1 Sustainability-Oriented Innovation as an Experiment for Future Implementation

In the interviews it can be observed, that the majority of the interviewees perceive reputation and media coverage/reputation, customer demand and SOI as important factors. Concerning reputation Stina states that “getting some interesting results that we could talk about to [their] customers.” was an important driver. Frida from Company B also said that they want to see if it “has an impact, meaning will we immediately get to the media and also does it mean anything for the brand, will the brand be perceived differently” also, she said, that the project will be evaluated according to “how the interest was but also how the media coverage was”. Filip from the university also mentioned “I think that more and more companies see first of all a marketing advantage”. Next to the obvious reason for companies to focus on customer demand in order to have a profitable business, their focus on the customer within sustainability efforts can be explained by the stakeholder theory. According to it, companies have to ensure to balance the needs of multiple stakeholders, instead of solely maximizing its financial success (Freeman, 1984). This becomes especially relevant since consumers seem to increasingly care about unsustainable behavior of fashion retailers (Textilwirtschaft, 2017).

In terms of customer demand industry representatives state: “We hope that the interest among out consumers will be very high” and “[we want to] see if they are interested in this way of producing garments” and that they want to find out “what is the interest of the end consumer.” These observations go in line with research about drivers for corporate sustainability, that found that one of the most important external drivers are customer demand and the most important connecting driver is reputation (Lozano, 2015). Other main drivers (Regulation and Legislation, Business Case, Leadership) found in the research by Lozano were, apart from Frida saying that they have to follow the regulations of the corporate group, either not mentioned by the companies or described as not existing. Stina for instance stated: “The project as such was not a business case for us”. Maja also said: “I would say we did not do this project to make any extra”. In contrast to this, Lasse from the university side said: “In the beginning I think the reason for participation of the companies is that it is economical feasible, that it is profitable for them.”

Out of the mentioned drivers, SOI, seems to be the main driver for the projects. Comments of interviewees from the industry side are as follows: “[The project] was to find some sort of a new business model, new solutions for sustainability.”, “For us it was really a matter trying something innovative.”, "In one sense we want to try out a new business model to see how you can do things a bit different", “This project offers a great opportunity to try a new, sustainable business model.” Interviewed university participants share this view: “[…] it is not only about sustainability improvements it’s more about a real radical innovation in a way.”; “[…] it is innovative. It has this sustainability aspect.”, “[The Companies] want to do innovation projects.” This goes in line with recent research findings, stating that the role of innovation
becomes more and more important within strategic sustainable management literature (Karakaya et al., 2014).

However, it also became clear that industry and university do have different viewpoints in relation to SOI. Interviewees, representing the university perspective, expressed the need for “a real radical innovation” and remarked that “the innovation level could be higher” within the projects, whereas the interviewees from the industry side said, “we are trying to create some innovation.” Moreover, Stina expressed cautious optimism towards innovation by saying:

> Our business model is completely built up on very conventional ways of doing business. […] To put this in a completely unconventional way of doing things […] was such a big challenge we never imagined. What’s the value of it?

Also, Lasse from the university mentioned “[The companies] don’t want to do too much innovation because it is not their business model.” Further he says that “It is very important that the companies have an innovative mindset” Filip confirmed this with his statement that “The project was conducted with similar firms.” Gustav mentioned in this context: “Lasse understands the company very well, so he knows we are a good fit.” Also, Frida from Company B said that “If [the project] had not suited our brand we would not have done it even if it was an amazing idea.”

This shows, that the level of innovation is a crucial point. First, the level of innovation strived by the university seems to be lower than the level of innovation the industry targets. The innovation level the university aims to reach corresponds, within the categories for SOI, with Systems Innovations according to Klewitz (2017) or Systems Building according to Adams (2016). This level is characterized as a “radical shift in philosophy to thinking beyond the firm and reframing the purpose of business in society” (Adams, 2016, p.192). Whereas, the innovation level the industry targets correspond with product, process, or organizational innovation, which is a lower level of innovation (Klewitz, 2017). Second, the level and type of SOI has to suit the respective companies, their brand and previous business model.

Further, it became clear that the projects were seen by the industry partners as a chance to test these SOIs as some sort of experiment, for future implementations. Maja from Company A mentioned in this context:

> I would say that [the project] is an idea and that we want to continue to work in this way. I think we need to think in another way in the future. I think on so many levels we need to experiment how we can take next steps.

Also, Stina from the same company said: “We are thinking about ta[king] the learnings forward and how to incorporate that.” The idea, that the project is seen more like a trial also becomes clear by Astrid’s statement: “We haven’t done anything like that at all, we just want to see that we can handle the problems that come up so that our system is prepared for things like this in the future.” Frida from Company B said:
Gustav declared in that regard: “collaborations helps to gain knowledge which is relevant for future projects and success of the company to generate money in the future through the project outcome.” Filip from the industry side holds the view that “the long-term goal is really to take the learning and the learned stuff and have some kind of knowledge transition to the companies.”

Since the projects apparently were more or less seen as experiments to test, if the SOI is realizable within existing processes, if it creates public interest and if the end product is well received by the customer, it seems that the focus was more on the future implementation. However, according to interview participants of the industry, the project as such did not have an appreciable impact on the three aspects of sustainability. Astrid noted concerning the economic aspect: “we have not seen anything for us yet” Maja revealed “[…] we came out of this project plus minus 0. Also, Stina said that “It was not a financial gain.” Further Filip from the university commented: “On the economic side it was decent.” Only Lasse, from the university side expressed more optimism towards the economic aspect by saying: “In the beginning I think the reason for participation of the companies is that it is economical feasible that it is profitable for them […].” Regarding how the project influenced the environmental aspect, Maja from Company A said: “[The project creates] internal awareness. [It] highlight[s] the importance for our designers, from on the beginning, to think of what they can do when they are designing.” Frida from Company B answered: “We have not calculated how successful it was for the environment”. Lasse noted: “But where it has impact first is on the economy. Afterwards automatically it will have environmental impact, because not so much is manufactured. But this comes later.” Finally, the social aspect seems to be the only one directly affected in an appreciable positive way during the project execution, as new local workplaces were created. As Filip stated:

The social aspect was overweighting. We set up a local manufacturing chain, here in Boras, and therefore we were able to create job opportunities and two markets two times. That is work integration and immigration projects. So, I think it had a big social value.

However, the fact that there was no impactful effect achieved on the three aspects of sustainability during the execution of the project, does not mean that the aspects are not relevant for the companies. As Frida stated for instance that “The environmental aspect is the most interesting part of that project, and this is also the reason why we made this project.” Lasse, from the university further said: “The drivers for the project are from the company’s point of view, reducing environmental impact. […] But where it has impact first is on the economy. Afterwards automatically it will have environmental impact, because not so much is manufactured. But this comes later.” Additionally, Gustav named the following drivers:
So, we try to do good in our company, so we look on sustainability issues. Since right now the textile industry is a really shitty industry. On the big picture we are both trying to solve this shitty industry [...] making it more environmentally friendly.

In fact, the fourth dimension of sustainability, time, as described in the Two Tiered Sustainability Equilibrium (TTSE) (Lozano, 2008) needs to be considered, as it can be observed that the companies strive with these projects to affect the three sustainability aspects more on a long-term perspective. The following statement by Filip summarizes this very well: “The long-term goal is really to take the learning and the learned stuff and have some kind of knowledge transition to the companies. So that should be the focus for our future [...]”. This means that the success of the sustainable aspect within the project collaboration, should be analyzed from a more holistic perspective, meaning from a short-term as well as from a long-term perspective, while considering that all four aspects within the TTSE interrelate with each other (Amini & Bienstock, 2014; Lozano, 2008). Exemplary for this, Maja from Company A reveals, that they already have started a new SOI project as a follow up project of the Project 1. She said:

We now launched a denim bag which is made out of worn out denim from the second-hand market, which I think is an even better way to produce the collection [...]. [Those bags] were something that came out from the [project], so we used our experience from the project and applied it. There are of course a lot of things that we have learned to do in another way for the future.

Quite controversial to Maja’s statement, Stina, also an interviewee from Company A said: “It is absolutely not dead, it is resting. We are thinking about [how we can take] the learnings forward and how to incorporate them.”, when she was asked how the company plans to integrate the outcomes of the project and what the next steps after the project are. The controversial statements of the interviewees from Company A might be explained by a reorganization of the departments. Maja stated in this context: “I am not involved in the sustainability team anymore”. Interpreting this statement, it can be assumed that they might not know what the other project team is working on and wherefore they have different answers, however, the real reason still remains quite unclear.

4.2 Differences between the different Business Approaches of Industry and University

Analyzing the given expert interviews several differences regarding the business processes as well as the business alignments of the involved parties became obvious. In general, it can be said that industry – university collaborations self-explanatory entail differences in regard to the business orientations of the two partners. This could be explained by the fact that both parties belong to different types of institutions which follow disparate principles, and which are pursuing different business approaches. Nevertheless, these differences need to be analyzed and examined in order to counteract these kinds of circumstances and to avoid possible misunderstandings and difficulties in future project collaborations.

Interviewing members of the university and members of the industry it became apparent that different business approaches can lead to dissimilar project purposes. In this context, one
project coordinator (Filip) of the University of Borås mentioned the following statements: “It is an academic project and at the same time it is a commercial project.”; “Companies see first of all a marketing advantage from committing in sustainable matters.” These statements emphasize the balancing act of the projects between research development and commercialization. Whereas the industry aims to generate innovative products which can be commercialized profitable, the university targets to bring further the state of research by investigating unexplored research areas. Project coordinator (Lasse) of the University of Borås likewise explained this discrepancy by the following statement:

The companies want to participate but they don’t want to do research projects, they want to do innovation projects. They want to implement, but this is not really what we are doing. So, our challenge is to be able to take those challenges and to develop the research further.

These statements are in accordance with the research findings of Bruneel et al. (2010) who state that companies are mainly focusing on capturing valuable knowledge in order to create competitive advantage, whereas universities are primarily driven by the creation of education and knowledge. The sustainability manager (Stina) of Company A underlined the different business approaches of both parties by the given statement:

The university does not really understand our business. It is a learning for them as well. If they do not get to do this [project collaboration] with the private sector, how will they learn? They will also live in some kind of theory where things are possible which are actually different.

In this context Perkmann et al. (2011) point out that it is of high importance to discuss the structural differences between industry and universities. Members of the university are aiming to conduct open science in order to publish research findings. However, firms are striving for proprietary strategies which need to be protected to guarantee a competitive advantage. It therefore becomes clear that science tends to be long-term oriented, whereas companies are interested in short- and medium-term occurrences. (Stina) obviously addresses these circumstances by demanding the academic sector to have a realistic view on the industry’s business processes with all its challenges and potentials. In the opinion of (Stina), it is about going through a learning process from both perspectives. (Filip) the project coordinator of the University of Borås even goes one step further by stating that in some project cases it is important to use formal agreements such as contracts to provide a framework for the research collaboration and to secure rights regarding the knowledge and the research in general. (Filip) describes the alliance as “a strange kind of relationship” by explaining that the nature of the relationship has not directly been understood from the universities point of view. The more participants and stakeholders get involved into the project, the more purposes are existing, wherefore the importance of an establishment of research agreements and regulations increases.

As Brunnel et al. (2010) discovered, the barriers of industry – university collaborations can mainly be classified into two types of barriers; orientation-related barriers and transaction-related barriers. Taking the interviewees’ statements listed above, Brunnel et al.’s orientation-related barriers can be confirmed and general differences in the orientation of both involved parties underscored. It becomes obvious, that the different business approaches of industry and
university need to be considered in order to mitigate the resulting differences during the project process. All project participants have to be aware of possible orientation-related barriers, so that these are not affecting the project success. In this context Gustav mentioned the existence of two different business cultures which need to be brought into accordance by making compromises. Getting educated about the opposite cultural direction is important, in order to adapt to these differences. Nevertheless, differences in the business orientation not only occur because of fundamental cultural differences, it already starts in terms of different operating procedures and time schedules. As an example, one interviewee stated that different time scales within both organizations can lead to challenges:

We are never on the same scale, we want to do stuff super super fast. […] But we are adjusting to the university and how they work, that works quite ok. We are not upset about it, we are ok with it, but of course we would like to move much faster (Gustav).

Gustav traces back the time aspect to the number of involved participants; the more people are involved in a project the more expenditure of time has to be factored. Thus, the aspect of time and communication cannot be considered separately from each other. Three interviewees mentioned the issue of finding time as a challenge and directly associated it with the factor of communication. In this connection Astrid of Company D mentioned a situation in which she and her team felt left out because an important process step, conducted from their side, has been skipped. In this case Astrid experienced the communication as not sufficient enough. As room for improvement, Astrid suggested the compliance of a project schedule which visualizes the present project status and upcoming project tasks. According to Bruneel et al. (2010) and Betts and Santoro (2011) the effectiveness of inter-organizational communication is seen as important factor for weakening the barriers to collaboration. In accordance with two interviewees, especially the allocation of responsibilities as well as the formulation of clear objectives at an early stage of the project can lead to a smoother process execution.

4.3 Synergic Effects of Industry-University Collaborations

According to the interviewees’ perceptions, the occurrence of synergy effects represents an important and significant effect of industry – university collaborations. As it became obvious during the interviews, synergy effects occur in different process steps and subject areas. In the case of industry – university collaborations they mainly appear in the form of knowledge transfer and implementation support. The Triple-Helix Model of innovation by Etzkowitz and Leydsdorff (1997) likewise covers the phenomenon of synergy effects as it visualizes interactions between the three institutions industry, university and government. It discusses four levels of dimension which all strive towards the enhancement of dynamics for innovation and knowledge creation. The model emphasizes that all three organizations are interconnected by means of a triple helix cooperation which aspires to fill gaps in innovation systems (Rodrigues & Melo, 2013; Leydesdorff & Etzkowitz, 1996; Dooley & Kirk, 2007). Based on this knowledge, it is important to mention that all interviewees stated that their main project objective is to explore new business models by creating knowledge and structures for the development of a circular economy in the fashion business. In this connection, Stina from Company A admitted that she and her colleagues “do not really have the expertise inhouse”.

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Wherefore Company A decided to obtain support from “people who have more insight and who have the knowledge”. In reference to this, Frida, sustainability responsible at Company B, made the following statement: “the project management [support] that we are getting [from the university] is a bonus for us, that is such a huge help, it gives us a lot of knowledge and insight into how the textile industry is active and alive in Borås right now”. Additionally, she stated that in the first place, the collaboration enabled them to participate in the given project and that Company B would not have been able to implement this project on their own.

As Santoro and Chakrabarti (2001) pointed out in their research, research support, cooperative research, knowledge transfer and technology transfer represent four highly related components encompassed by industry – university collaborations. The dimensions emphasize four different ways how knowledge can be transferred in order to develop new technologies. Doing so, all dimensions are highly intertwined and each particular can be found in both of the analyzed project cases. During the conducted interviews it became noticeable that research support, cooperative research and knowledge transfer are high prioritized within industry – university collaborations. As the above given statements emphasize, the companies as well as the university attach great importance to the interactive nature of collaborations which is mainly characterized by exchange of resources and knowledge. Astrid from Company D is convinced, that a project success is dependent upon a well-balanced professional expertise within the team: “We are all experts in our parts, they have managed to put a team together with people who really know what they are doing”. She further on stated that “everyone has really collaborated and put in effort and has been able to share their experience. That has been one of the key factors”.

While analyzing the occurrence of synergy effects it is necessary to take a closer look at the research field of the given project cases. Since both projects are researching in the field of SOI, the aspect of sustainability has to be considered as well. Throughout the interviews it became evident that a lack of knowledge in the field of SOI is existing. Three of eight interview participants explicitly mentioned that, within their organization, a lack of knowledge regarding circular economy and customization in sustainable supply chain management is present. As Perl-Vorbach et al. (2014) discuss, due to the multidimensional nature, the development of SOIs requires knowledge, skills and research skills, which are often separated from an organization’s knowledge base. Therefore, Klewitz and Hasen (2014) argue that the development of SOI requires interorganizational exchange of resources and knowledge flows. In that sense, Stina, the sustainability manager of Company A expressed herself by stating that the collaboration “was a learning process” to them. Going on, she stated that the “aim was to take the learnings and incorporate them in to a bigger scale” (Stina). One of the interviewed project coordinators at the University of Borås, considers that research in the field of circular economy requires collaboration networks in order to develop new value networks (Filip). These statements go in line with the research of Lozano (2007) who named communication, experience sharing and involvement as key requirements for collaboration. Doing so he talks about the need for “a change from individualistic mindset and behavior” to a beneficial use of differences and individual fortes of the involved parties. All things considered, it is about combining forces by cooperating with each other, in order to overcome research limitations (Freel, 2005; Hansen & Klewitz, 2012).
Gustav from Company E indicated that the expertise, his company is gaining from the project collaboration, is one of the most important drivers for collaboration: “Experience wise we are growing, and we need the experience to be a successful consultancy”. This statement emphasizes, that Gustav attaches importance to the long-term outcomes his company can gain from the collaboration. Outcomes which would not be existing without external knowledge and resources. The resource dependence theory provides an explanation for the necessity of external resources, since it states that organizations with different resources are benefiting from collaborations by sharing and developing further each other’s resources. In case of the given project cases it is mainly about sharing knowledge in the field of circular economy as well as customization and its implementation potentials in the fashion business. In this context Filip the project coordinator at the University of Borås, assesses the university as innovation platform. According to his statements, the university was given the task to take in a coordinating position within the research field of circular economy, whereby its main goal is to create a platform for collaboration. It therefore can be said, that within the given project collaborations, the university provides innovative resources and knowledge about research in the field of sustainability, whereas the chosen companies permit insights and practical experience in the fashion business. These synergy effects are of high attractiveness for both collaboration partners.

Taking a closer look at long-term benefit factors, Astrid from Company D mentioned that the collaborations are not only highly effective from the knowledge transfer perspective, additionally the social aspect takes in an important role: “So we think it is a good way to collaborate with the university, so the students maybe get the ability to see how it works in the real life, not only in the books, and also you meet a lot of people […]”. Astrid furthermore pointed out that her customers are frequently asking for industry contacts because they are looking for new employees or trainees. According to Astrid, it is “good to have a contact in the school” so that she can recommend potential candidates from the university to her clients. Synergies effects obviously are not only occurring in conjunction with knowledge transfer and research support, moreover industry-university collaborations lead to synergy effects in all of the following three areas: economic, social and environmental.
4.4 Teamwork

As a result of analyzing and coding, two further major focus areas within the interviews emerged: the aspect of teamwork and the lack of necessity for evaluation. Those aspects were particularly made subject of all interviews conducted and addressed in different ways.

The area of teamwork has multiple facets. Trust is named by the majority of the interviewees as a crucial factor for a successful and target oriented project collaboration. “Without trust we wouldn't start, trust creates the situation where we can get fully creative and deliver good projects” stated by Gustav, can be seen as the leading way of thinking in regard to trust by all interviewed persons. Moreover, this statement was also supported by other interviewees, stressing that trust is the building block to exchange crucial information which is then, in turn, needed to go into detail. For instance, measures of items for the purpose of creating a TechPack.

A good personal relationship is recognized to be an essential factor within the framework of a successful working partnership. In this context Gustav mentioned “usually companies like us do not like to do projects like this, but we like Lasse”, this shows that a personal relationship is powerful as in this case it seems to be a significant factor for whether a company participates or not, in the first place. In addition, Lasse revealed “I know the people of the project quite well, they are friends of mine. So, if they want something, they just ask.” This means that the collaborations have mainly been taken place due to personal network connections between the project coordinators of the university and industry participants. This is also an example of how the personal relationship can simplify the communication, resulting into more efficient processes. Further, it is noticed that an enhanced candor and lack of specific knowledge in regard to circular economy or sustainable production was communicated comprehensively right from the start. So, the matters of sensitive data or company secrets have been excluded in favor for a successful project and problem solving. This correlation of trust can be identified on its own as a proof of trust from the industry towards the university and vice versa. This resulted into a feeling of being a team right from the start and or nearly being part of the company, expressed by both parties. In doing so, trust ensured a continuous flow of information and supported further collaboration between the industry and the university (Barnes et al., 2002). In addition to trust, commitment is identified as an important factor “commitment was there right from the beginning” (Gustav). Frida for instance said “if [Filip] had not stepped in and had gone beyond his scope of work, we would have not been able to do this project at all”, this shows high commitment from the university side. Whereas from the industry side the high expenditure of time as well as the set-up of a whole team, which dedicates solely to the project, can be referred to as high commitment. Stina said in regard to this, that Company A had a “core project team, but obviously there were a lot of other people involved to make that happen.” In addition to this Maja said that the workload of the team was equivalent to “two persons working full time [...] for half a year or even more.” Moreover, the project manager of each party is recognized to be the driving force for trust development and maintenance (Barnes et al., 2002). In particular, a continuous dedication of one team leader was identified and proofed by the interviewed parties to be the driving force and uphold for interrelated trust and commitment. This person is defined in theory as a so-called champion, being responsible for boundary spanning activities (Betts & Santoro, 2011).
Since trust comes with continuity, the necessity of clear responsibilities and a predefined fixed project team of experts are setting the stage for it (Barnes et al., 2002). With reference to this, Astrid expressed that “We are all experts within our field, and they have managed to set together a team with highly educated people, this is a key factor” (Astrid). The interviewed persons from the industry acknowledged this statement and stressed that having complementary experience and knowledge was important to reach the targets of the project, but also in respect to time management. This is caused by the fact, that these collaborations are run next to the daily business of the industry partners. However, a member from the university side mentioned that, “there was a little bit of a lack of knowledge from the industry side about what can be done and the circular economy” (Filip). This led to a situation where the supporting role and expertise within the research field from the university became determining for further execution of the project.

In addition, it is detected that the involvement of the top management played a major role for the effort taken by the industry in regard to the project. Industry partners, where the top management was fully involved or even initiator of the project collaboration, were identified with a more balanced division of labor between the university and the industry. Whereas partner constellations with less involvement of the top management or “only blessing giving” from the top management resulted into the situation of a reduced degree of participation from the industry side (Barnes et al., 2002). Moreover, an interviewee from the university side outlined that “the composition of the teams is important since [they] really want to develop something” in context with the involvement of the top management and the successful execution of the project collaboration. Depending on the orientation of the project collaboration, each party allocated at least one person for a subject area. For instance, garment technicians, buying managers and designers for the circular economy project. In doing so, clear responsibilities and a more structured project execution is ensured (Barnes et al., 2002).

4.5 Necessity of Evaluation

The theory and literature within this research reveal that the evaluation of executed project collaboration is crucial to become aware of the effects they had and the knowledge they produced (Barnes et al., 2002; Todorović et al., 2014). Further it is stated that an evaluation assures the project fulfilled the requirements for which it was conducted (PMI, 2004). However, the majority of the interviewees expressed that a full evaluation, applying a measurement tool or program, was not conducted. In addition, a clearly structured analysis of the cooperation and collaboration management, internally and externally, was not executed. The parties that did measure their project performance and collaboration used feedback rounds and group discussions as their preferred way of evaluating, however, without a measurement tool. A meeting to exchange the thoughts and sales figures presented in a powerpoint presentation is described by Maja is one example. Further, Gustav stated that “talking to people leads to good or bad for a project”, as well as Frida explaining that “no specific measurement tools where used. Each involved department just used the tools they are usually using within their frame,”. These statements showcase a reduced necessity perception for evaluating the projects in regard to collaboration management and a successful interaction between the parties. Moreover, no
specific industry-university collaboration evaluation framework, as described in the literature of this research, was taken into consideration. Rather, the focus was on evaluation according to the outcomes and the knowledge creation for both, the industry and the university. The fact that, especially the knowledge creation for future projects was as crucial for the industry as for the university, stands in contrast to the literature and theory since intangible outcomes are often leading to the cognition of failure for the industry according to Barnes et al. (2002). Another fact that stands in slight contrast to this theory is that, all interviewees from the university side expressed that the development of a tool and solution for circular economy as their critical success factors for the collaboration. For this reason, the university used Vinnova, to check if the collaboration output fulfilled the deliverances in regard to circular economy. The tool perceived as suiting due to the fact that the Vinnova agency aims to strengthen Sweden as a country of research and innovation (Vinnova, 2018). Consequently, both sides put either no or reduced effort in evaluating their project success by the use of a tool. Moreover, the focus for the industry and the university was on knowledge creation and solution development which formed their success factors. Once this was reached, the industry-university collaboration was declared as successful, regardless of substantial investment in terms of time, cost and resources (Barnes et al., 2002).

4.6 Funding

The last main focus area that emerged during the analysis of the conducted interviews is the topic of funding. This area was not expected to be a crucial fact within the subject matter since the funding theme can be seen as an operation solely between the government and the university. Interviews with governmental representative as well as the investigation of agreements and contracts between university and government, were not implemented as they would have gone beyond the scope of the given research. The Triple-Helix Model is arguing that universities are taking on a strong position as leading institutional sphere along with university and government (Rodrigues & Melo, 2013). As mentioned in the limitations of this thesis, this research only discusses the interplay between industry and university. However, in the course of the interview execution it became evident that the topic of funding remains an important role within the given collaborations. This is caused by the fact that funding can be identified as a mutual driver for both parties. Interviewees with both parties confirmed that funding enabled industry to the same extent as the university to research and develop within the field of SOI projects. Moreover, they admitted that without the funding “very little, close to none” (Lasse) research would have been conducted. Further, one participant from industry stated that “financial support is key for joining this collaboration” (Gustav). Therefore, it seems that the official character of funding can be considered as a further motivation for participation in collaborations. Thus, governmental funding can be seen as a guarantor for reliability and positive public reputation. In that respect, Frida expressed that “it was about trying out a new business models and also doing it as a project that is funded by the Västra Götalands region”. According to information from the university, the funding is provided to the university wherefore they hold the financial authority. However, the industry side does not receive any direct payouts. All project related research and operational costs, external to the companies, are covered by the funding provided to the university. Thus, the industry partners do receive
financial report indirectly. Consequently, the financial risk for the companies can be decreased, as SOIs in general are already perceived to be high in risk which might increase the attractiveness of these projects for both parties (Fichter, 2005).
5. Discussion

This chapter first summarizes the main findings and results of the research, followed by an examination of the literature and theoretical foundations. It is the purpose of this chapter to discover implications and to answer the formulated research questions. As a result of this, a good practice model is developed.

The aim of this thesis is to develop a model to release the potential benefit of industry-university collaborations promoting SOI. Therefore, two project collaboration cases are analyzed with regard to different aspects affecting these alliances. Interviews have been conducted with project representatives of the University of Borås and business professionals of the industry partners. By analyzing the conducted interviews, six main focus areas are identified. According to this subject matter main factors for an effective realization of the given kind of project collaborations will be deduced. Out of these, a model in regard to good practice shall be created which can be utilized by practitioners of academia and industry.

Innovation Level of Sustainability-oriented Innovation
The interviews revealed that the development of new business models in the field of sustainability development can be seen as main driver for industry partners to participate in project collaborations. Albeit the innovation orientation differs between the individual industry partners, all of them already have an innovative approach. It is also found out, that universities and industry are aiming for different levels of innovation. Thus, the level of innovation is an important factor for the choice of partners, as common objectives lead to a more efficient project execution. Furthermore, it can be said that the projects were used by the industry partners as a sort of trial to test the SOIs for future implementations and therefore the long-term perspective is an important factor to consider.

Differences & Synergy Effects between Industry and University
In addition, it was found that fundamental cultural differences of academia and industry can lead to dissimilar project purposes. In order to avoid misunderstandings and difficulties during the project process it is highly important that both parties are aware of possible differences in order to mitigate these. The different business cultures need to be brought into accordance by making compromises. However, the occurrence of synergy effects represents a significant outcome of industry-university collaborations. In this context knowledge transfer and implementation support can be seen as the most meaningful ones. Especially within the field of SOIs, synergy effects can be deployed for the benefit of both parties.

Evaluation through Success Factors
The interviews revealed that both sides put either no or reduced effort in evaluating their project success by the use of a tool. Moreover, the focus for the industry and the university was on knowledge creation and solution development which formed their success factors for the project collaboration. Once these factors were reached, the industry-university collaboration was declared as successful, regardless of substantial investment in terms of time, cost and resources. Beyond that, trust is named by the majority of the interviewees as a crucial factor for a successful and target oriented project collaboration. In this context, it became clear that the
matters of sensitive data or company secrets have been excluded in favor for a successful project and problem solving. Further, it become evident that support by the top management is equally important as a committed team. With regards to a committed team, the constellation of it is perceived to be effective if a team of experts within their field is grouped. Besides, funding emerged to be an important role within the collaboration between industry and university during the interviews. The official character of funding is considered as motivation for the participation in collaborations and as a guarantor for reliability and positive public reputation.

**Sustainability Aspect within the Projects as changing Factor**

The given research findings agree to some extent with the state-of-the-art literature, nevertheless, several points fail to comply with theory. In the following an in-depth discussion of the research findings in regard to literature is conducted. To begin, an entrepreneurial paradox has been discovered. Usually, the industry focuses on profit and economic benefit (Lozano, 2015), however in these projects, an immediate business case failed to appear. In regard to the statements of the interviewees, it can be argued that the sparse financial outcome of the projects are outweighed by the projects’ sustainable future potential. Moreover, in literature it is stated that the fashion industry mainly focuses on short-term objectives within their strategy in order to respond to market changes (Bruneel et al., 2010; Dasgupta & David, 1994). Academia, in turn, is operating on the long run. This is caused by the fact that the aim of universities is to develop research over a long period of time in order to gain comprehensive data and knowledge (Bruneel et al., 2010; Perkmann et al., 2011). However, in the case of the given collaboration projects, it became obvious that the sustainability aspect changes the strategic procedure. The companies did not receive any significant tangible outcome directly from the projects. However, they noted that the project in general was a success, as it helps their strategy on the long run. This goes in line with literature stating that sustainability is a process that evolves over time as it requires structural changes (OECD, 2001). It has to be added that the given collaboration projects deal with SOIs which go in line with the companies’ sustainable strategy, as they are concerned with topics such as circular economy, which the companies aim to achieve on the long run. It can be concluded that the projects support their strategic sustainable development in the way that they serve as a trial to test out a new business model on a small scale in order to enable its realization in future on a large scale. In addition, the collaborations provide the industry partners with knowledge which is needed in order to make progress with the implementation of their strategy. Consequently, the projects actively support the SSD on a long-term perspective. Thereby, the first question “How do the sustainability-oriented innovation projects influence the strategic sustainable development of the chosen Swedish fashion brands?” is answered.

**Attractiveness and Preconditions of the Projects**

The sustainability aspect is an important factor for industry nowadays, since consumers seem to demand higher engagement in this aspect (Textilwirtschaft, 2017). Therefore, SOI projects are attractive to fashion businesses engaging in this matter. However, in this context, the level of innovation has to be in accordance with the companies’ business model, therefore the projects have to be adjustable (Kotnour & Buckingham, 2001; Klewitz, 2017). Another fact that contributes to the attractiveness of project collaborations is that each party holds complementary resources, which are desired by the other. In this context, the Triple-Helix
Model argues that complementary resources are required to enable internal transformations within the different organizations (Etzkowitz, 2011). Klewitz and Hansen (2014) moreover put forth that new ideas and information as well as resources that are more distant to the organization's own environment are required for SOIs. This means that the university obtains resources in terms of knowledge and research, which the industry is not able to develop on its own. In turn, the industry offers business insides and the chance to apply research of the university in practice. The knowledge creation, resulting from this synergy effects, can be seen as main driver for both parties. Nevertheless, for each position individual drivers are identified. According to literature and findings within this thesis, the main driver for both parties is the creation of a new sustainability-oriented business model. As basis serves the exchange of knowledge as well as the support of research and practical applicability. On an individual level, industry participants are getting access to research know-how and technology. Additionally, they are striving for enhancement of reputation as well as potential hiring of students and academics. Universities mainly strive for the experience of industrial applications. In addition, they are focusing on research success through publications and patents, founding of academic spin-off companies and a good reputation in academia (Grimaldi & Tunzelmann, 2002). Since sustainability efforts can improve the image of fashion brands, reputation is an important driver for academia and industry. Consumers are claimed to increasingly care about sustainable matters in regard to fashion (Textilwirtschaft, 2017), customer demand also constitutes an important driver for fashion brands. Thereby the question "What are the drivers for sustainability-oriented innovation collaborations between the University of Borås and the chosen Swedish fashion brands?" is answered.

The different Business Approaches of Industry and University

In theory industry-university collaborations are seen as a new promising concept, to approach complex problems (Kauppila et al., 2015; Fontana et al., 2006), especially in terms of sustainability challenges (Selsky & Parker, 2005; Bryson et al., 2006). However, due to the fundamentally different nature of both organizational structures, several discrepancies in business processes, differences in goals and varying objectives in regard to collaborative work within the project arise. For instance, Barnes et al. (2002) and Moilanen et al. (2015) state that collaborations between the industry and universities are perceived to be an increasing enrichment for both parties and can be seen as powerful mechanism. Whereas, it was shown in this research that on the one hand the university has difficulties understanding the business processes of the industry partners and on the other hand the industry is lacking in time to intensively deal with research to the extend desired by the university, resulting into different operation structures. Thereby, the research question “What are the drivers and challenges of the collaboration between the University of Borås and the Swedish Fashion Industry?” is fully answered. In order to prevent these orientation-related barriers, an awareness of the given institutional cultures has to be built (Bruneel et al., 2010). In addition, the fact of more involved participants and stakeholders, with different business approaches and project purposes, require the establishment of research agreements and regulations. This is needed to protect the collaboration from unrealistic expectations or misinterpretations (Barnes et al., 2002). Nevertheless, proper inter-organizational communication can act as key for overcoming the discrepancies.
Team Philosophy within the Projects

In the course of the interviews, team philosophy took on another important role. A consistent team of experts and a balanced commitment of all participants can be seen as promoting factor when it comes to a successful interaction within project collaborations. The top management has to be informed and ideally involved in the project. This involvement enhances the overall will to commit. A smooth project execution can be promoted by the establishment of clear responsibilities within both parties, right from the start. This is confirmed by Barnes et al. (2002), who mention that clear responsibilities with a steady number of people leads to a clear allocation of tasks and a structured project execution. In order to ensure that responsibilities are clearly divided, goals are defined, and inter-organizational communication ensured, Betts and Santoro (2011) state that an empowered and influential individual, or a champion is supposed to be selected. Since those collaboration champions are responsible for boundary spanning activities, champions are the key figures that develop a good interpersonal relationship between both parties (Betts & Santoro, 2011). As the literature states, industry champions are seen as more influential than university champions. This can be confirmed since the project is depended on the participation of the companies and the companies are mainly providing the resources. Nevertheless, during the interviews it became obvious that the champions of the university are taking on a leading position in regard to project planning and execution. Furthermore, participants of the industry admitted that the project coordinators of the university have taken over more responsibilities than actually planned. It can therefore be said that university champions seem to have more decision-making power, however, the university members are keeping it all together.

As it became evident during the interviews, a good personal relationship can additionally strengthen and simplify the communication, internally as well as externally (Barnes et al., 2002). In this connection, Newig et al. (2011) mentioned empathy as essential factor in collaborative situations. It can therefore be said, that a good personal relationship can be built on empathy. Another essential factor that has an influence on the personal relationship is trust. A trustful interaction between both parties is recognized in both, literature as well as practice, as fundamental need for successful collaboration (Ring & Van de Ven, 1992; Betts & Santoro, 2011; Bruneel, et al., 2010). Especially the matters of sensitive data or company secrets are based on a trustful relationship. In the case of the given research, it became apparent, that the exchange of sensitive data represents no obstacles within the partnerships, due to a high level of trust.

Evaluation within the Projects

Within industry-university project collaborations, evaluation and thereto related methods or frameworks to measure the outputs, outcomes and impacts of these collaborations are intensively debated (Fontana et al., 2006; Kauppila et al., 2015). For instance, it is argued that the evaluation and performance measurement is vital to establish a knowledge domain, strengthening future projects and to become aware of the effects these projects left (Linzalone & Schiuma, 2015; Todorović et al., 2014). However, the projects within this investigation were not evaluated with measurement tools or programs in terms of collaboration management. In general, none of the involved parties did place great importance on project evaluation. The actual evaluation the companies conducted was outcome based, without using any specific
industry-university collaboration frameworks. In fact, sales figures, media coverage and achievement of deliverances were examined. In addition, the evaluation was mainly based on casual feedback rounds and group discussions with the involved actors. According to the interviewee's statements, it can be concluded that the reason for doing so, is the fact that the projects were conducted as trials, and therefore no specific expectations were risen. Moreover, it can be argued that the sustainability aspect changes the evaluation of the project collaborations, since sustainability is a condition that evolves over time, as already mentioned above. Therefore, also companies are looking at the project success more from a long-term perspective. Even though no tangible major achievements in economic, social and environmental aspects could be measured subsequent to the projects according to the interviews, they were still rated as successful, as a distinct success often ensues after a longer period of time.

**The Model**

From the results of the discussed research findings, a good practice model is concluded. This model incorporates all identified factors which have significant impact on the perceived success of the project collaboration. Many factors within the model are also supported by other research in this field, that provides evidence of the wide-ranging application of this model beyond the examined project collaborations. Further, this research also revealed new success factors considering the sustainability character of the project collaborations. These important findings require attention and a careful management in order to guarantee effective and successful sustainability-oriented industry-university collaborations.

![Good Practice Model for SOI-Collaborations between Industry and University (Own Illustration)](figure)

**Explanation of the model**

The given model is subdivided into three process sections of factors that need to be considered in order to successfully collaborate in SOI projects. The individual sections are: Preconditions,
Project Collaboration-Partnership Characteristics and Evaluation. In order to conduct a successful industry-university collaboration there are several preconditions which need to be fulfilled. So as to a collaboration is interesting for potential collaboration partners, in the first place, both parties need to hold desirable resources for each other. Hence the collaboration represents an added value for industry as well as for university. In addition, to handle the mentioned discrepancies between the industry and the university, an awareness of different institutional cultures is required. A way to respond to these differences is to develop adjustable projects. Moreover, when conducting sustainability-oriented innovation projects an already existing sustainability approach is a supporting factor, as it enhances the relevance of the project to the companies and thus increases the overall commitment. In this context the it is also essential that the involved parties strive for a similar level of innovation in general and in respect to the project collaboration. Therefore, the right balance of innovation level within the projects is found to have a significant impact in the success of the interaction. Next to this, mutual benefits must be given to develop suitable relevance and attractiveness of the projects for both parties. Additionally, it is found that financial support can lead to a minimizing of risk and thus make the project more attractive to potential collaboration partners. The mentioned preconditions take on an important role in the prearrangement of collaborative alliances which can be ensured by means of collaborative agreements and contracts.

A strong collaborative partnership compromises team related and process related characteristics. A strong and consistent team of experts and a supportive top management forms the basis for a successful project collaboration. The allocation of clear responsibilities as well as the selection of well-chosen collaboration champions correspond with high importance. Specific attention has to be payed to the formation of a good personal relationship which is mainly based on trustful collaborative effort. In order to generate a smooth workflow several process related characteristics need to be considered as well. The development of clear common objectives as well as the establishment of a mutual agreed project schedule for both parties are recommended. Additionally, project processes should be monitored in avoidance of misunderstandings and duplication of work. Flexibility as well as an open and respectful inter-organizational communication can be regarded as necessary characteristics for strong collaborative partnerships. As previously discussed, sustainability-oriented project collaborations have to be considered over a long-term perspective, as their impact mostly come into force after a period of time. Since project evaluation has emerged as very important factor, short-term as well as long-term perspectives have to be considered. Therefore, the development of a holistic evaluation approach can be seen as an indispensable factor. The holistic approach is intended to involve the three factors economic, environmental and social in order to reflect upon the implemented project from different perspectives. Nevertheless, it can be said that on the basis of previously discussed findings in this context, the evaluation should not only focus on the outcomes, but rather also the general collaboration management, value chain improvements and the mutual outcome relative to the input of each collaboration partner should be consulted. With this model the third research question “What factors need to be considered when evaluating sustainability-oriented innovation project collaborations between universities and fashion brands?” is answered.
6. Limitations & Future Research

This research is limited only to one case study, based on two collaboration project cases of the University of Borås. Therefore, the perspectives captured within the investigation are restricted to the Swedish fashion industry and the University of Borås. Therefore, in future investigations, a broader view can be perceived, by evaluating additional cases within the field of fashion, resulting into further validation of the given findings. Moreover, in order to answer the research questions, industry as well as university representatives have been interviewed. However, the topics comprise more actors, such as the government, external agencies and suppliers. Therefore, the position of these third parties in regard to the subject matter should be incorporated into the investigation, within future research, in order to gather a more holistic perspective. In addition, only some representatives of the project team have been interviewed, however, a more reflective insight, could have been achieved by interviewing more team members. Moreover, it should be mentioned that at the time the research was conducted, the projects cases had different project statuses. Consequently, the data that was gathered cannot be considered equivalent. Future research should investigate the projects after its final stage. Such research would allow to further test and refine of the model in order to support its effectiveness as tool for practitioners. Another point that limits the significance of the findings of this thesis, is the restricted time period of the investigation of the given collaboration projects. Since sustainable development evolves over time, conducting a long-term study is required to fully evaluate the impact of the SOI projects. A bigger sample size as well as a longer period of time invested in the investigation would have exceeded the scope of the given thesis.
7. Conclusion

The last chapter of this thesis points out the general conclusions of the research. Besides this, it answers the overall research question and gives suggestions for future investigations in respect to the given research topic.

It was the aim of this thesis to investigate how to release the potential benefit of industry-university collaborations promoting SOI by analyzing the projects between the University of Borås and the Swedish fashion industry. Thereto it was investigated how the SOI projects influence the strategic sustainable development of the participating partner. Moreover, the drivers and challenges of the collaborations were identified and finally, the factors that need to be considered when evaluating SOI project collaborations between those parties were determined. The results show that the SOI projects promote the companies’ strategic sustainable development on a long-term perspective and give the company the chance to try out new business models in accordance with their sustainable strategy. Moreover, the companies receive comprehensive knowledge which is created through the synergy effects in interaction with the university. This knowledge is needed to support the realization of their strategy towards a more sustainable business. The investigation shows that the main driver for industry and university is the development of new sustainability-oriented innovative business models and the obtaining new valuable knowledge.

There are several challenges that occur within industry-university collaborations, such as different objectives and disparate time schedules. Thus, the main challenge is to overcome those differences, which evolve due to the fundamentally different natures of the two institutions. Out of the findings a model could be created presenting factors found to have significant impact on the success of the projects. These factors need to be considered to be successful in the following areas: preconditions for collaboration projects, partnership characteristics as well as evaluation. The model helps the collaboration parties to look at the projects from a different perspective, since the it guides both collaboration partners to evaluate the project holistically, without only focusing on directly measurable hard facts. This may lead companies to be more indulgent with the immediate project success evaluation and prevents them of assessing the projects too premature in a negative way. Consequently, the potential beneficial impact of industry-university collaborations on strategic sustainable development can be released by considering the presented factors of the model, being aware of the mentioned challenges and making sure that the projects go in line with the sustainable strategy. Thus, the overall research question of the given thesis is answered.

These research findings constitute a new contribution to the body of knowledge regarding the effective management of industry-university collaborations in the field of SOIs. Moreover, the research findings can provide practitioners with valuable knowledge and insights, which supports the successful execution of collaboration projects within the field of SOIs in the fashion industry.
References


Sang, K. J., & Sitko, R. (2015). *Qualitative Data Analysis Approaches*


Appendix

App. 1: Success Factors

<table>
<thead>
<tr>
<th>Themes</th>
<th>Project A</th>
<th>Project B</th>
<th>Project C</th>
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<th>Project E</th>
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Table 1 Success Factors of Collaborations (Barnes et al., 2002).
App. 2: Interview Guide

General Information:
1. Can you quickly outline your position and your responsibility within the project?
2. Is this your first university collaborations? Yes or no?
   If no: with University of Borås or with another university?
   If no: Name?
3. a) Which and how many departments and employees are involved in the project?
   - Did you set up a team focused on this project?
   b) How is the involvement of the top management within the project?
4. a) How does the communication process with the university took place - frequency and form wise? (E-Mail, workshop, meeting, how often)
   b) Are you satisfied with the communication between the parties.
5. What is the current status of the project? Will you conduct a project evaluation?

Project Preparation:
6. In your opinion, what are the drivers for the project participation from your company perspective?
7. In detail, why did you decide to collaborate with University of Borås? What are the advantages in your opinion?

Project Execution/Measurement:
8. How are you measuring the project performance of the project within your company?
   8a.) Which project measurement tools/methods do you use?
   8b.) What are your critical success factors for the project?
   8c.) Which milestones did you set yourself for the project process?
9. How successful is the project regarding social, environmental and economic aspects?
10. What are the major outcomes of this collaboration for your company?
    Will you/Do you collect feedback from your customers, if yes, how was the feedback regarding the project?
11. What is your (planned) input for this collaboration in terms of time.

Sustainable Development
13. What is your sustainable development strategy? Do you have any specific tools, goals or visions that you are applying? (such as Circular Economy, Lifecycle Assessment etc.)
14. How is the project supporting your strategic sustainable development? How big is the impact on it? Or is it something you do more parallel to your strategy?
15. How are you planning to integrate the project outcomes in your future sustainable development? What are the next steps after this project?

Improvements:
16. Do you have any suggestions for improvement regarding the project idea / the process and implementation?
17. Is there anything left to say you want to share with us?
Can you recommend us any other contact person which we could interview?
App. 3: Background Good Practice Model

![Figure 1: Good Practice Model for Collaborations (Barnes et al., 2002).](image)

Factors found to be particularly influential in the case studies are in italics.
**App. 4: Effort agreement**

Indicate your individual contribution to the project in the table below and attach this as an appendix in your report.

<table>
<thead>
<tr>
<th>Name</th>
<th>Contribution (%)</th>
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In case of different contribution, indicate here who has contributed with what. For example: Who has written the text, who did the presentations, who did the interviews etc: