CSR as a Driver of Innovation

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Abstract

This study evaluates the relation between CSR and innovation by evaluating NPD projects with a CSR orientated company. By means of six exploratory case studies, the influence of the CSR orientation on NPD is assessed. The results of this study indicates that there is a link between CSR and innovation. CSR orientation will trigger boundary spanning activities, entrepreneurial activities and commitment, which will in turn enhance innovative performance.

Keywords: CSR, Sustainability, Innovation, Qualitative Research, Case Studies
Management Summary

Introduction and background
In recent years the interest in the understanding and the implementation of CSR has increased. With this interest, however, also the debate regarding the business case of the concept has risen (Pujari, 2006). Apart from the practical problems companies experience in implementing sustainability (e.g. Walley and Whitehead, 1994) researchers have not yet been able to come up with a solid business case that financially legitimates the implementation of policies supporting CSR. The large amounts of articles evaluating this business case produce inconclusive results (Griffin and Mahon, 1997; McWilliams, 2006). This deadlock is also apparent in practice; whereas some companies embraced CSR as the road to competitive advantage (Weber, 2008), others are more reluctant and associate this drive towards CSR with higher costs and thus a restriction on economic performance (Cerin and Karlson, 2002). This renews the debate regarding CSR by claiming that the adoption of a CSR policy and subsequent organizational drive towards CSR can positively enhance the innovative performance of the company.

In the last two decades, dozens of scholars and practitioners have studied the concept of CSR and its influences on company performance. This research field has only slowly developed due to the multitude of definitions of CSR (e.g. Carroll, 1999; Van Marrewijk, 2003), but especially the lack of a clear business case for implementing the concept. In these decades however, a clear trends has emerged from viewing CSR from a compliance perspective, with costs and trade-offs with other corporate goals, towards an opportunity perspective, where CSR is portrayed as the win-win logic (Pujari, 2006). This win-win logic was first proposed by Porter and Van der Linde (1995) and has later been adopted by numerous other scholars (Horbach, 2007; Keeble et al, 2008; Pujari et al, 2004). Porter states that by stricter governmental regulation, industries will tend to innovate, and with that create a first mover advantage. This is also known as the Porter Hypothesis. Although this view has been criticized by others researchers (Palmer et al, 1995), the few empirical studies regarding this proposition yield promising results (Horbach, 2007; Rennings, 2003).

A limitation of the studies regarding the validity of the Porter Hypothesis however, is the fact that both the Hypothesis and subsequent research has focused on the national or industry level, thereby facing practical and scientific limitations. From an academic point of view, these multi-company studies have only concentrated on the presence or absence of the relationship between innovation and CSR. Thereby, they failed to generate in-depth insights in the mechanisms that establish this relationship. From a practitioner’s point of view, the research regarding the Porter Hypothesis fails to provide managers with concrete insights that can be used in the strategic and tactical issues these companies faces. They fail to indicate which elements of CSR policy they can integrate to enhance innovative performance within an individual company. Although some researchers (Porter and Kramer, 2006; Turpitz, 2004) have indicate that the Porter Hypothesis might also be valid on firm level, as of yet no researchers evaluated this claim.
Research objective and Questions
This study therefore aimed to develop further insight in the effect of CSR policy on company innovative performance. It aims to evaluate by which mechanisms a corporate CSR orientation can foster innovation. In order to evaluate this question, individual innovation projects were be evaluated, and the influence and outcome on CSR related issues will be discussed. More specifically new product development (NPD) projects were identified as the best type of innovation projects which could be studied. Subsequently, answers are sought to the following research question:

Does a strategic CSR orientation influence NPD projects and if so, what are the mechanisms behind this relation?

This question then was split up into more detailed sub questions.

1) How is NPD success measured?
2) Which drivers contribute to success in NPD projects?
3.a) Does a CSR orientation affect NPD project?
3.b) How does a CSR orientation affect the NPD project and the drivers of NPD project success?
4) Are CSR projects that are more in line with the company’s CSR orientation likely to be more successful?

These question lead to the following research model:

Research Model

Research methodology and setting
The innovation projects which were selected were new product development projects. The study was conducted at a chemical company in The Netherlands, which highly commits to innovation and CSR. The former was shown by the R&D expenditure increase of fifty percent between 2005 and 2007 and the more than one hundred new product introductions between 2006 and 2008. The latter is shown by its high rankings in the Dow Jones Sustainability Index since its introduction in 2005. In total, six case were selected. Four cases were regarded as highly successful and compliant to the company’s CSR orientation, one was less successful but highly compliant to the CSR orientation and one was successful but not highly compliant to the CSR orientation of the company. From every case R&D professionals, project leaders and/or business managers were selected for interviews, in such a way that the respondents could cover the entire life cycle of the case. In one hour semi-structured interviews, these individuals were questioned about the success of the project on both financial and CSR conditions, the factors which were important for the project success and the influence of the CSR policy on the project. These interviews were than transcribed and coded. Next to that, case documentation was studied. The main conclusions were that (1) an interview framework was needed to make sure that data collected was comparable between the interviews and (2) a pilot study was needed to ensure the data collected could be used for theory development.

Research preparations
In order to give the interviews the structure required, first a literature study was done to find possible categories of drivers influencing NPD projects, which were than divided into six categories: NPD process, Culture, Organization, NPD strategy, Senior Management, External parties. These categories were used as a guideline for the interviewer. To make sure the interviews were mutually comparable first a pilot of two projects was done. After this pilot, there was room for evaluation of the results and possible adaptations of the research methodology. The pilot study consisted of two NPD cases scoring high on success and sustainability. The results of the case study showed that the data collected from the interviews and additional documentation were comparable across the cases. Furthermore, the pilot study showed that proposed categories of drivers were not optimal. Some small adaptations were done to increase the quality and comparability of the data collected in the other cases studies. Because these adaptations were small, the data collected during the pilot cases was also used for data analysis.

Data analysis
The six cases were first evaluated separately. By making case descriptions of each case, insight in the collected data was ensured. Furthermore, these within case analyses indicated that the influence of CSR orientation on NPD projects was mainly present via the drivers of NPD projects. This helped to direct the cross-case analysis. For the cross case analysis, all interviews were transcribed coded. All text fragments that regarded drivers of NPD success or CSR were coded. These groups of codes were developed into more comprehensive code categories and themes. Then, relations between CSR orientation and themes NPD success drivers were analyzed.

Results
The data analysis brought insight in the research questions developed in the second section of the study. Summarize the analysis showed that
1. Although the company cares about CSR, the success of NPD projects is measured almost entirely on economic aspects, such as return on investment, market share and profit. This indicates that the fact that a CSR orientation is adopted in recent years has not changed the evaluation criteria of NPD projects.

2. Fifteen drivers of NPD success were identified

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<tr>
<td>2. Supplier involvement</td>
<td>10. Team Leadership</td>
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<tr>
<td>3. Technology Platform</td>
<td>11. Team Commitment</td>
</tr>
<tr>
<td>5. Third Parties (e.g. consultants)</td>
<td>13. Goal Orientation</td>
</tr>
<tr>
<td>7. Continuous improvement</td>
<td>15. Communication</td>
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<td>8. Cross Functional Team</td>
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3a. The corporate CSR orientation was found to have a two-way influence on NPD team members. Formally, by leading to compulsory new rules and regulations and informally, by creating awareness of the importance DSM attached to this topic. By doing this, the CSR orientation influences some drivers of NPD success and triggers new NPD projects.

3b. CSR orientation is influencing NPD in three distinct ways.
- It enhances commitment from both managers and employees to be involved in projects that possess CSR characteristics. More resources are available to these types of projects.
- It triggers cooperation and communication with external parties (i.e. suppliers, customers, and consumers). In order to make sure DSM’s products are used in line with the CSR orientation of the company, these parties need to be involved in the NPD process.
- It triggers innovation by the initiation of new NPD projects or changes in existing ones, based on the strong focus of DSM to ensure optimal use of resources internally and for its customers. Some employees respond to this by taking up own initiatives to make improvement and develop products that address social and environmental issues.

4. With a sample of just six projects, finding strong relations between broad concepts as sustainability and success was not possible. The findings of RQ 2, 3A and 3B predict a positive relation between CSR and NPD performance. By means of enhanced market orientation, supplier involvement, customer involvement and focus on continuous improvement, CSR focus in projects is likely to make them more successful. Furthermore, projects showing CSR characteristics will be likely to be more successful because they are subject to more commitment from the team members and top management.

These answers indicate that a corporate CSR orientation affects NPD projects in three distinct ways; by enhancing commitment, external orientation and improvement of the project or creation of new projects. These findings were further assessed by exploring literature on the topic and were developed into three propositions.
**Proposition 1:** Higher levels of CSR orientation will lead to improved NPD project success by increased boundary spanning activities such as (A) supplier involvement, (B) customer involvement and (C) market orientation.

**Proposition 2:**

A: Higher levels of CSR orientation will lead to improved NPD project success by increased entrepreneurial activities.  
B: Higher levels of CSR orientation will lead to improved NPD project success by the creation of new NPD projects.

**Proposition 3:** In firms with a strong CSR orientation, team member and managers will be likely to receive more intrinsic and extrinsic rewards when they are associated with more sustainable products. CSR Orientation therefore moderates the relationship between product characteristics and management and team commitment.

Based on these three propositions, then a final model regarding the influence of CSR on NPD was developed.

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**Final Model**

**Conclusions**

This study has evaluated the relation between CSR and NPD development trajectories. The results of the study show that CSR influences NPD projects in multiple ways, as is depicted in the model above. A stronger CSR orientation is likely to lead to increased boundary spanning activities, more commitment from NPD managers and team members and more new initiatives within and around the NPD projects. This shows that companies that are adopting a stronger CSR orientation are likely to do more than strengthen their social and natural environment. At the same time, these companies might also strengthen their future competitive advantage by stimulating innovation within the company.
The results of this study are useful for both researchers and practitioners. Researchers can take the insights and propositions developed in this study as a starting point for further studies. They should focus on testing these propositions by means of more explanatory studies. Furthermore researchers should focus on testing factors that can be influential for the proposed relation, but were not addressed in this study. For example, the influence of industry type, culture and company size. Practitioners in turn, could use this study to streamline processes in their daily practice. This study shows that concepts like CSR and innovation are interrelated. For general management, this should be a stimulus to adopt CSR and promote this throughout the company. For other functions in the company the results of this study show that opportunities for innovation and CSR might be in close proximity of each other. Especially purchasers, marketers and NPD professionals should be aware of this and use these insights to their advance.

Of course, this study has also some limitations. Because of the small sample size taken, the one company focus adopted in this study and the availability of only one researcher, one should be careful in generalizing the results of this study. However, the insights provided by this study are not affected by these factors.
Acknowledgements

This thesis reflects the process and results of a six month study conducted at DSM Sourcing in Sittard. With that, it also marks the end of my time at Eindhoven University of Technology, where I spent the past six and a half years. This final project has probably been both the most challenging, educative and rewarding experience I have encountered during this time. One of the most important lessons I have learned is that it is hard, if not impossible, to complete such a project without the support of others. This section is therefore dedicated to thank everybody who has supported me during the past six months.

First of all, a huge ‘thank you’ is reserved for Arie Sonneveld, my thesis supervisor at DSM. Arie, you have provided me with a wonderful environment for conducting this study. You were always interested in the results, without pushing for it. Furthermore, you gave me the freedom of following my own path, which was sometimes not the one most relevant for you. Without this flexibility, I do not think I would have been as proud of the result as I am now.

Next to this, I would like to thank my university supervisors; Arjan van Weele, Hans van der Bij and Miriam Kibbeling. In the past months, all of you hugely contributed to this thesis. Arjan van Weele as mentor and thesis supervisor; you let me choose my own research topic and setting and were supportive throughout the project. Furthermore, you steered me when necessary and encouraged me to give just that little extra when needed. Discussions with Hans van der Bij ensured that my research proposal was solid from the beginning, which saved me lots of time later in the project. Furthermore, your comments on the final draft of this thesis gave me the insight and motivation to improve it one last time. Finally, Miriam Kibbeling spent a huge amount of time listening to the problems and questions I came across, and supported me on sometimes even a day-to-day basis. Miriam, thanks for helping me out when needed, and good luck finishing your own research!

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Introduction

Corporate Social Responsibility (CSR) and sustainability are amongst the biggest trends in business nowadays. More and more companies are spending resources on activities that have to make them more sustainable. Examples of such activities are reducing waste, charity and developments of cleaner products. The main reason that companies are investing in such activities, is that they expect Social Responsible companies do perform better in the long run (Weber, 2008). Not everybody agrees on this view. Some companies argue that investing in CSR and sustainability activities will lead to higher costs and not necessarily higher incomes. Thus, these companies conclude that engaging in CSR/sustainability is not beneficial in the long run (Cerin and Karlson, 2002). So, whereas some companies see committing in CSR and sustainability as positively related to competitive advantage, others associate this with decreased competitive advantage. Many researchers (e.g. Egri et al., 2004; McWilliams et al., 2006) studied this dilemma by comparing companies with a strong CSR orientation with companies that are not engaging in CSR activities. These studies have not produced conclusive results.

Innovation is widely accepted and proven to be one of the major contributors to a firm’s long term performance (Grant, 1996; Lengnick-Hall, 1992). Some scholars have proposed that CSR regulation can play an important role in the innovative performance of companies and thereby enhance their long term competitive advantage (Little, 2004; Porter and Van der Linde, 1995a; Porter and Van der Linde, 1995b). Empirical research evaluating this proposition is scarce, but the studies that do assess this proposition (Horbach, 2008; Rennings, 2003) report confirming results. These studies however, are conducted on a national or industry level, not on the level of individual firms. Although the used setting was useful for testing the correlation between the two concepts, it does not provide understanding of the mechanisms behind this relation, nor does it give individual firms concrete guidelines improving their performance. Thus, the proposition made above has not yet been evaluated on the level of a single firm. As indicated above, the problem whether to invest or not to invest in CSR is a decision that has to be taken by each company individually. On this firm level no research has been conducted exploring whether strict CSR orientation can trigger or stimulate innovation. This is the aim of this study.

If the claims of the researchers mentioned above are confirmed, CSR can be used to improve a company’s innovative performance. In this case, the mechanisms behind it will enable firms to increase their innovative performance by adopting and/or adjusting their CSR policies. It can stimulate managers to implement and improve their CSR orientation and might present promising new directions for the management of relations between firms.
1 Problem Description and Research Objective

This chapter introduces the scientific and practical problems regarding Corporate Social Responsibility (CSR). Then, the problems surrounding CSR are discussed. Following a recent, mostly theoretical stream of research, the potential of CSR as a driver for innovation is introduced. This results in the objective of this study. Finally, the relevance for both researchers and practitioners is evaluated.

1.1 Background of the study

CSR and sustainability are among the biggest buzz words in both academia and practice nowadays. These concepts are often used interchangeably in literature (as are terms like green, eco-, corporate citizenship, etc). All these concepts basically refer to the principle that firms not only have economic, but also environmental and societal responsibilities. In this study, the term CSR is used, because it stresses the importance of the role of the company. Although attention for CSR has increased during the last decades (see Lee (2008) for an overview), there are some problems that make it hard to determine the exact value that CSR brings to a firm. These problems relate to the lack of academic and practical consensus on what CSR actually means and the absence of a clear relation between CSR and company performance. First, the academic consensus is discussed and later in this section attention is given to the absence of a clear relationship between CSR and company performance.

Scholars do not agree on a clear definition of CSR. Many scholars have proposed different definitions (Carroll, 1999; Van Marrewijk, 2003; Sutton, 2004), which makes it hard to compare the work of different authors and to indicate what CSR exactly incorporates (McWilliams et al., 2006; Mebratu, 1998). The following definition is chosen:

“CSR is the obligation of the firm to use its resources in ways to benefit society, through committed participation as a member of society, taking into account the society at large and improving welfare of society at large independent of direct gains of the company” (Kok et al., 2001)

This definition is chosen for three reasons:
• its broadness;
• it decouples a relation between CSR and direct gains;
• it enables to differentiate companies.

First of all, the broadness of this definition highlights the importance of the obligation of a company to act as society expects it to, which includes for example taking care of the environment. Some definitions of CSR do not take this into account.

Second, this definition highlights the fact that direct gains cannot be expected as a result of engaging in CSR activities, which is in line with practical findings (box 1).

Box 1: Costs and benefits of CSR

Over the last years, participants report increasing their investment in CSR, in terms of staff, budget and top executive time (CSRWire, 2008). Some companies report significant savings without related investment, while others report high expenditure without any related savings or additional income.

Two examples; in 2004 BP reported savings of 600 million as direct result of an internal emissions trading program. BP claimed that the costs of implementing this program were non-significant (Heal, 2004). In 2007 Mitsubishi reported an investment of 900 million in improvements of environmental related issues, without any related savings or benefits (Mitsubishi, 2007).
This difference in benefits from CSR can be explained in two different ways:

1. Carroll (1999) identifies four components of CSR: economic, legal, ethical and discretionary or philanthropic. The economic component is the company’s responsibility to make a profit. The legal component is its duty to obey the law. The ethical component is their responsibility to respect the rights of others and to meet the obligations placed on them by society that ensure these rights. Finally, the discretionary component involves philanthropic activities that support the broader community. Following Carroll, different forms of CSR activities can be predicted to have different outcomes. Some activities can generate financial benefits (e.g. economic), while others cannot (e.g. philanthropic).

2. Other authors argue that a link between CSR and financial performance is unlikely to be found because of many variables influencing the relation (Husted and Allen, 2007). They argue that researchers should focus on a more stepwise relation, which would offer a more logical explanation to such dilemmas.

Finally, it should be noted that the definition stated above makes it possible to see differences between organizations. For example, companies that are more committed to listen to the needs of society can be considered to have a stronger CSR orientation than companies that do not listen to the needs of society. This is in line with observation of Tulder et al. (2008), who differentiate between proactive and reactive CSR (Table 1). In the light of the chosen definition, it is argued that pro-active companies have a stronger CSR orientation than reactive or inactive companies.

### Table 1: Different types of CSR activity (adapted from Tulder et al., 2008)

<table>
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<tr>
<th>IN-ACTIVE</th>
<th>RE-ACTIVE</th>
<th>ACTIVE</th>
<th>PRO/INTER-ACTIVE</th>
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<tr>
<td>“Corporate Self Responsibility”</td>
<td>“Corporate Social Responsiveness”</td>
<td>“Corporate Social Responsibility”</td>
<td>“Corporate Societal Responsibility”</td>
</tr>
<tr>
<td>Legal compliance and utilitarian motives</td>
<td>Moral (negative) duty compliance</td>
<td>Choice for responsibility and integrity: virtue</td>
<td>Choice for inter-active responsibility; discourse ethics</td>
</tr>
<tr>
<td>Inside-in</td>
<td>Outside-in</td>
<td>Inside-out</td>
<td>In-outside-in/out</td>
</tr>
<tr>
<td>“doing things right”</td>
<td>“don’t do things wrong”</td>
<td>“doing the right things”</td>
<td>“doing the right things right”</td>
</tr>
<tr>
<td>“doing well”</td>
<td>“doing well and doing good”</td>
<td>“doing good”</td>
<td>“doing well by doing good”</td>
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</table>

Apart from the inconsistencies in defining of CSR, a second problem makes it hard to find the value that CSR brings to a company. Companies adopt CSR, because they believe it will bring them long term competitive advantage (Weber, 2008). To explore how companies can benefit from adopting CSR, many researchers have studied the relation between CSR and company performance. The number of theoretical relations proposed is large. For example, Weber (2008) proposes that CSR orientation would lead to better reputation, lower risks on fines and customer retention leading to a better company performance. However, Griffin and Mahon (1997), Margolis and Walsh (2003) and McWilliams (2006) have not been able to find a clear positive relation. Husted and Allen (2007) and Schaltegger and Synnesvedt (2002) state that the lack of a clear relationship is caused by the large number of variables involved and the lack of a common definition as stated above. These authors argue that a more stepwise approach should be followed, finding the direct relation between CSR and other variables and subsequent company performance. Examples of this stepwise approach are the proposals of a positive relation between higher CSR orientation and retaining workforce (Turban and Greening, 1997) and the positive relation with less risk of receiving negative
press (Richardson et al., 1999). These factors can enhance firm performance in the long run, but are not proven to be solid business cases for CSR. Therefore, it is interesting to look for other variables that can be influenced by CSR.

1.2 The Porter Hypothesis; innovation as the business case for CSR?

Innovation is proven to be one of the major drivers for competitive advantage (Grant, 1996; Lengnick-Hall, 1992). Some researchers and practitioners have also looked into the possible relation of regulation and innovation. These researchers (Porter and Van der Linde, 1995a; Fontrodona and MacGregor, 2008) and practitioners (Friedman, 2008; Keeble et al., 2006) argue that regulations regarding environmental or social practices are likely to cause companies to change their behavior and refocus their attention on developing new products and services. These new, innovative products and services in turn create competitive advantage (Szymanski et al., 2007). In literature this proposition is known as the Porter Hypothesis which is defined as:

“Properly constructed regulatory standards, which aim at outcomes and not methods, will encourage companies to re-engineer their technology. The result in many cases is a process that not only pollutes less but lowers costs or improves quality”. Porter and Van der Linde(1995)

Porter makes this proposition mainly to encourage governments and industries to adopt stricter regulation to stimulate the development of new and better products and processes. On this level (national or governmental) his proposition is confirmed by studies of Horbach (2008) and Rennings (2003). More general the Porter Hypothesis states that when companies are forced or encouraged to change their behavior, they might come up with new, innovative solutions. This makes the proposition adaptable for CSR. It might be stated that companies adopting a CSR orientation -and thereby trying to reduce their negative impact on society and the environment- will encourage themselves to change and will become more innovative. Some practical experiences support this line of thought (box 2).

**Box 2: Two business examples of CSR and innovation**

Patagonia (manufacturer of outdoor/survival clothing) is highly committed to CSR. When they started looking for more sustainable raw materials (they wanted to make their clothing recyclable) they found an entirely new fabric (fleece based upon recycled bottles). These new patented technologies made it possible to make an entirely new line of clothing (and subsequent price premium). *Source: Husted and Allen (2007)*

When Bell Atlantic undertook Project Explore in Union City, New Jersey in the early 1990’s, it strived to improve inner city children's learning with technology. During the process, Bell Atlantic developed new insights about networking technologies that more than justified the cost of the project. These insights led to a patented and profitable technology that became Bell Atlantic Infospeed DSL. *Source: Vilanova et al. (2008)*

Porter and Kramer (2006) and Turpitz (2004) also propose that the Porter Hypothesis might also work for CSR orientation. To date however, no empirical studies have addressed this, making it impossible to judge whether these propositions are correct. Next to this, even if the Porter Hypothesis would propose a possible relation between CSR and innovation, it does not explain why this relationship exists and how it can be influenced (Palmer et al., 1995). Although the Porter Hypothesis links CSR and innovation, empirical evidence is needed because:

1. The hypothesis focuses on the relation between (governmental) social/environmental regulation and innovation, instead of a relation between CSR and innovation.
2. The hypothesis proposes a relation, but does not address the underlying logic. This makes that it is not possible to follow Porters chain of logic and evaluate whether this works within an individual company.

1.3 Research objective and relevance

Based upon the above, it is interesting to examine whether a company’s CSR orientation can also influence the innovative performance of a company. By evaluating innovation within a single firm, this study can provide insight in these questions. Furthermore, by studying a single firm, the exact logic behind this relation can be examined. Therefore, the objective of this study is:

| Evaluating whether strategic CSR orientation can foster innovation and if so to explore the mechanisms behind this relation |

This study is relevant for researchers because it is one of the first to evaluate whether CSR can trigger or stimulate innovation within a single organization. By doing so, it brings empirical evidence to a field in which until now only theoretical propositions exist. Furthermore, by examining the relation between CSR and innovation, this study can bring additional insight into the effects of CSR. This will help in proposing a business case for the CSR. Finally, a better understanding can help to link CSR to other, more developed fields of organizational research, such as performance management and stakeholder management.

This study can assist practitioners in evaluating whether and how CSR influences company performance. If a link is found between the two concepts, managers can answer to stakeholder pressures to take more responsibility for their environment and at the same time strengthen their organization. Furthermore, detailed insight in how a possible relation between CSR and innovation might function will help practitioners to deploy their (limited) resources available for CSR activities in such a way that it maximizes organizational performance.

1.4 Intermediate conclusion

In this section CSR is defined and the problems regarding the concept are addressed. The Porter Hypothesis is introduced; a theoretical proposition which indicates that CSR orientation can have a positive influence on innovative performance. The lack of empirical evidence and relevance for both practice and research for this proposition on an organizational level are discussed. Together, the gap in literature and the possible benefits for both researchers and practitioners are the basis for this research objective.
2 Research Approach and Setting

This chapter focuses on the goal of the study and the path that should be followed in order to reach this goal. First, based on the nature of the research objective, the appropriate research approach is identified. Based upon this, more detailed research questions are developed. Then, the research setting and its characteristics are explored, to make sure that the research approach and research questions can be addressed in this setting. Also, a short literature review of the important concepts of this study (i.e. CSR and innovation) is presented.

2.1 Research approach

There are only a few in depth evaluations of the actual effect that a CSR orientation has on the firm’s daily activities (Werre, 2003). Research regarding the effect of CSR orientation on the innovation process mainly seems to focus on propositions in business reviews (Porter and Kramer, 2006) and working papers (Turpitz, 2004). These authors do state a possible relation, but do not evaluate the logic behind this relation. As a result, no existing theoretical framework was found that could be followed and/or tested to assess the influence of CSR orientation on innovative performance. Therefore, the purpose of this study is to build theory, rather than to test it (Babbie, 1975; Eisenhardt and Graebner, 2007). This study is concerned with assessing whether CSR influences innovation. The grounded theory approach (Glaser and Strauss, 1967) is chosen as approach because it gives the researcher freedom to develop theory from raw data in a systematic way (Van Aken, 2007). It allows the researcher to explore the topic without a predetermined framework and has the possibility to develop theory from the data collected. By using this approach, a theory can be developed, which can be used to explain the relations found in the events studied. This theory can than later be tested and adapted to improve its validity and explanatory power.

The research objective stated in the previous chapter clearly focuses on the study of real-life events. Case studies are therefore selected as research method. This research strategy enables the researcher to obtain in-depth insight in contemporary events (Yin, 2003). Case studies are flexible research methods which allow the researcher to focus on the interesting events that form the basis of the theory (Eisenhardt, 1989; Gersick, 1988). In order to better understand the influence of CSR on innovation, this study’s focus is on innovative projects. Innovation projects are projects in which new products or processes are developed and thus new ideas are generated and implemented. Here, New Product Development (NPD) projects are selected for a number of reasons. In most organizations, there are a lot of these projects (Strebel, 1987) and they can be expected to have a clear beginning and end. New ideas often are the basis of these projects, or arise during these projects (Damanpour and Gopalakrishan, 2001). Therefore, NPD projects are directly linked with organizational innovativeness and success, which makes them the right type of projects to address the research objective.

2.2 Research questions

The main research question is derived from the research objective stated in section 1.4. Given the research approach discussed above, it is further specified as follows:

| Does a strategic CSR orientation influence NPD projects and if so, what are the mechanisms behind this relation? |

Graphically, this is depicted in figure 1.
In order to reach the goal of this study and answer the main research question stated above, it is divided in more specific research questions (Verschuren, 1991). These questions have to be broad enough to enable freedom in the depth of investigation (Corbin and Strauss, 2008). To evaluate the success of products, first success in NPD projects has to be defined. How do both the firm and the project team members evaluate success? Using literature alone, no clear answer can be given. Although a large number of authors evaluate NPD project success indicators, no consensus on how this should be measured exists. Some authors perceive forms of CSR related performance as inherent part of organizational performance (Hanna et al., 2000), whereas others separate these and other forms of performance (Balabanis et al., 1998). If CSR is an important factor in determining this success, it is also likely that this will have an influence on the project itself. Hence, research question 1 is defined as:

**RQ1: How is NPD success measured?**

Furthermore, it is important to evaluate what determines whether NPD projects become successful. Even if CSR is not important in the determination whether a project is successful or not, a CSR orientation can still have an impact on other drivers of NPD project success. In order to evaluate this, it is important to focus on the drivers of NPD success. Although a large number of drivers is identified in literature (Ernst, 2002), it is important to get insight in the drivers that are essential the specific setting studied. These can play a key mediating role in assessing a relationship under interest. Research question 2 therefore is stated as:

**RQ2: Which NPD drivers contribute to success in NPD projects?**

After the success and the drivers for success of NPD projects are evaluated, the CSR orientation of the firm can be evaluated. Does this influence the project and if yes, how? Two separate issues have to be evaluated:

- Does the company’s CSR orientation influence the process and subsequently the individuals working on the project? In what ways are they forced or motivated to do things differently than they used to do?
- Then the effect of these actions has to be studied. How are the project and its drivers influenced by the company’s CSR orientation?

Therefore, research question 3 is split up into two parts:

**RQ3A: Does a CSR orientation influence a NPD project?**

**RQ3B: How does CSR orientation influence the NPD project and the drivers of NPD project success?**
Finally, it is interesting to look at the outcomes of the project on both social-environmental and economic terms. Can indications be found that the performance of the project on CSR terms has a predicting value for its economic success? Hence, research question 4 states:

**RQ4: Do NPD projects that are more in line with the organizations CSR orientation likely to be more successful than other NPD projects?**

The research questions are graphically depicted in figure 2.

![Research Model](image)

**Figure 2: Research model**

### 2.3 Research setting

The research setting in which the research questions above can be tested, has to posses certain characteristics. Namely, a company that has a lot of NPD projects and at the same time has a strong CSR orientation should be studied. The proposed research setting is a chemical company in The Netherlands. First this company is introduced and later it is evaluated whether this company possesses the right characteristics for this study.

Founded in 1902, DSM started as a state owned company primarily focused on the exploitation of the coal mines in the southern part of The Netherlands. With the growth of the mining operations during the first half of the twentieth century, DSM (an abbreviation of its former name De StaatsMijnen or its English translation Dutch State Mines) steadily became an important regional company. By-products of the mining process (ammonia, fertilizers and later base chemicals) enabled DSM to employ other activities and to grow beyond mining alone. Therefore, despite the decline and finally closure of the mines in the sixties and seventies of the last century, DSM managed to stay in business and to reinvent itself into a worldwide player on the petrochemicals and performance materials market. During the eighties and nineties, DSM focused on food ingredients and pharmaceutical products and with the sale of its petrochemicals division in 2002, DSM became a company that focuses for the major part on nutrition and (bio)-chemicals. Since then, DSM is transforming itself into a leading company in the fields of life science and material science.
Today, DSM has an eight point seven billion Euro turnover generated by activities on over two hundred sites in forty nine countries. DSM employs over twenty-three thousand people and has an operating profit of eight hundred million euros (DSM, 2007).

To assess the role of innovation and CSR within DSM, documentation was studied (websites and internal communications) and a round of orientation interviews (appendix A) was conducted. It was concluded that both innovation and CSR have a prominent place within DSM. In terms of CSR, DSM’s efforts are illustrated by the fact that they are listed for the sixth consecutive time as one of the top three performers in the Dow Jones Sustainability Index (DJSI) for the chemical sector. This sector is also among the three best performing sectors in the field of CSR (appendix B). Moreover, DSM is involved in the other high performing sector (i.e. Pharmaceuticals). It can thus be concluded that DSM has a strong CSR orientation.

Regarding innovation, DSM’s commitment is shown by the objectives they state in their five year plan, Vision 2010. This states that between 2005 and 2010, an additional turnover of one billion should be generated by new product contributions (www.DSM.com). Since the introduction of this Vision, over two hundred new products are launched. Furthermore, DSM has a well defined process in line, in order to make sure that new and promising ideas have maximum chances of being further developed within the company. This process (internally called Project Management Process, PMP) is a stage gate process (appendix C). This ensures that projects are reviewed on a regular basis, to monitor their progress and to be able to accurately predict future performance. At each stage, DSM uses both project managers and independent reviewer in order to assess progress. For this study this was of importance, because it indicates that all NPD projects can be expected to follow more or less that path. One other aspect that has to be taken into account is the fact that DSM also uses open innovation. Thus, not all NPD projects are initiated, developed and launched by DSM. Some are sold before launch, while others will be bought at some stage of their development. In selecting cases for this study, this should be kept in mind. Only cases initiated and fully developed at DSM are selected, because only for these case the entire NPD trajectory can be studied. Concluding, DSM offers a decent setting for this study.

2.4 Intermediate conclusion

Based upon the nature of the research objective and the limited theoretical background in literature, it is concluded that an exploratory research approach is most suitable for this study. Also, it is concluded that NPD projects are the most promising research objects for the study. Because of these observations, four broad and flexible research questions are identified. Furthermore, the research setting is explored. Here, it is concluded that because of the innovative character and the strong CSR orientation of both the company and the industry, the research setting is suitable.
3 Research Design and Methodology

In this section, first the design of the research project is outlined. The activities of data collection and analysis are described sequentially. Then the research methods are evaluated. This section describes the steps taken to select cases, collect data and develop this data into theory.

3.1 Research design

As described above, this study is concerned with theory building by means of case studies. To achieve this, a step wise process developed by Eisenhardt (1989) is followed (table 2).

Table 2: Steps in theory building research (Eisenhardt, 1989)

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Getting Started</td>
<td>Definition of research question</td>
<td>Focuses efforts</td>
</tr>
<tr>
<td></td>
<td>Possibly a priori constructs</td>
<td>Provides better grounding of construct measures</td>
</tr>
<tr>
<td></td>
<td>Neither theory nor hypotheses</td>
<td>Retains theoretical flexibility</td>
</tr>
<tr>
<td>2. Selecting Cases</td>
<td>Specified population</td>
<td>Constrains extraneous variation and sharpens external validity</td>
</tr>
<tr>
<td></td>
<td>Theoretical, not random sampling</td>
<td>Focuses efforts on theoretically useful cases — i.e., those that replicate or extend theory by filling conceptual categories</td>
</tr>
<tr>
<td>3. Crafting Instruments and Protocols</td>
<td>Multiple data collection methods</td>
<td>Strengthens grounding of theory by triangulation of evidence</td>
</tr>
<tr>
<td></td>
<td>Qualitative and quantitative data combined</td>
<td>Synergistic view of evidence</td>
</tr>
<tr>
<td></td>
<td>Multiple investigators</td>
<td>Fosters divergent perspectives and strengthens grounding</td>
</tr>
<tr>
<td>4. Entering the Field</td>
<td>Overlap data collection and analysis, including field notes</td>
<td>Speeds analysis and reveals helpful adjustments to data collection</td>
</tr>
<tr>
<td></td>
<td>Flexible and opportunistic data collection methods</td>
<td>Allows investigators to take advantage of emergent themes and unique case features</td>
</tr>
<tr>
<td>5. Analyzing Data</td>
<td>Within case analysis</td>
<td>Gains familiarity with data and preliminary theory generation</td>
</tr>
<tr>
<td></td>
<td>Cross- case pattern search using divergent techniques</td>
<td>Forces investigators to look beyond initial impressions and see evidence through multiple lenses</td>
</tr>
<tr>
<td>6. Shaping Hypotheses</td>
<td>Iterative tabulation of evidence for each construct</td>
<td>Sharpens construct definition, validity and measurability</td>
</tr>
<tr>
<td></td>
<td>Replication, not sampling, logic across cases</td>
<td>Confirms, extends and sharpens theory</td>
</tr>
<tr>
<td></td>
<td>Search evidence for “why” behind relationships</td>
<td>Builds internal validity</td>
</tr>
<tr>
<td>7. Enfolding Literature</td>
<td>Comparison with conflicting literature</td>
<td>Builds internal validity, raises theoretical level, and sharpens construct definitions</td>
</tr>
<tr>
<td></td>
<td>Comparison with similar literature</td>
<td>Sharpens generalizability, improves construct definition, and raises theoretical level</td>
</tr>
<tr>
<td>8. Reaching Closure</td>
<td>Theoretical saturation when possible</td>
<td>Ends Process when marginal improvement becomes small</td>
</tr>
</tbody>
</table>

The framework of Eisenhardt can be divided in two groups of activities: steps towards data collection (step 1-4) and the steps towards theory development (step 5-8). These activities are addressed below.

Data collection

A round of introductory interviews was done to assess the current situation at DSM and create a platform for the project. These interviews provided an insight in possible cases and which methods for data gathering would be useful. A large number of NPD projects was available to be studied. Interviews were identified as the primary source of data collection. This because
they can be targeted at the phenomena under research and give insight in perceived causal inferences (Yin, 2003). To overcome some of the weaknesses of interviews (for example response bias and reflexivity) a number of measures was taken. It was decided to interview multiple respondents per case (reducing respondent bias), make the interviews open and unstructured (reducing reflexivity) and use additional information sources such as internal and external documentation (enlarging validity). Because the data collection is largely based on interviews, it is important to develop an instrument that ensures that data collected from cases can be compared across the cases.

The research framework of Eisenhardt does not take restrictions in time and other resources into account. Eisenhardt (1989) argues that when case studies early in the process are not delivering the results as anticipated more cases can be added until results are achieved. Because this study is subject to time restrictions, this was infeasible. Therefore, it was decided to study six NPD projects and use the two first ones as a pilot. After collecting data from these pilot projects, the research methods and collected data are reviewed in order to evaluate the usability of the collected data. According to Eisenhardt (1989) and Yin (2003) an overlap in data collection and evaluation is allowed and even stimulated in this type of study. Therefore, the use of a pilot does not bias the study and the results obtained during the pilot can also be used in the data analysis.

Theory development
After analysis of the data, the research questions are answered. These answers give insight in whether and how CSR and innovation are related. Together, these answers form the basis of a theory confirming or rejecting the influence of CSR orientation on innovation projects. From these insights, hypotheses can be developed, which are validated by literature. If possible, other fields of study are used to strengthen these hypotheses. Together, these hypotheses are developed into a model, which can explain the relation between CSR and innovation, or explain why such relation does not exist. In figure 3 the research activities are represented. It shows the subsequent steps that are taken to achieve the research objective stated earlier. Any deviations from this path is explicitly stated and explained in the report.

![Figure 3: Research activities](image)

3.2 Methodology
This section describes in detail the methods used for data collection and analysis. In order to ensure validity, reliability and the possibility to generalize the findings this needs to be
evaluated up front. For all steps of the data gathering and analysis, the methodology is described.

**Case studies selection**
From the large amount of NPD projects available at DSM, the selection of case studies was based on the dependent variables of sustainability and success. The sampling method chosen is referred to as ‘polar types’ (Eisenhardt and Graebner, 2007) which refers to selecting some cases with either high or low characteristics on success and sustainability. This method of non-random sampling is proposed by Eisenhardt and Graebner (2007) in order to achieve maximum results in theory building research. It should be noted that some extreme forms are not possible, for example because unsuccessful NPD projects are stopped early in the NPD process. Also, the exact score on both success and sustainability cannot be fully evaluated up front. In this study four cases were included of which the outcome is successful and sustainable, one case of which the outcome is unsuccessful and one case of which the outcome is successful but non-sustainable (figure 4). This number of cases selected was seen as optimal because the results of multi-case studies are more robust and gave the possibility of replication and contra-replication of the results (Eisenhardt 1989; Eisenhardt and Graebner, 2007; Yin, 2003). This number of six studies also enabled sufficient time to explore each case in-depth and strengthen the cases with additional documentation, ensuring triangulation (Yin, 2003). Finally, the composition of the cases enabled maximum attention to the cases that are sustainable and successful, in which it is most likely that results are found. Still, other types of cases could be evaluated.

![Figure 4: Case selection](image)

**Data collection**
The goal of the case studies is to extract data to develop insight in the effect the company’s CSR orientation has on the NPD projects. Furthermore, they should give insight in existence of differences between more and less sustainable and successful projects. In order to do so, case studies are conducted using products DSM has launched in previous years. From each of the selected cases, two or three persons are interviewed. The interviewees include a R&D
professional, the project leader and one person involved in the launch of the product. The average interview length is one hour. Also, the interviewees are asked to provide documentation and whether they can be contacted for additional information, if required, later in the study. This is seen as important for gathering stable and exact data (Yin, 2003). After the pilot of two cases (both performing well on sustainability and success), it is evaluated whether the data obtained is cohesive enough for enlarging the sample. If the two cases differ too much to be comparable, literature is used to find a number of factors and mechanisms. Their presence is then tested in the next cases. If the cases are comparable, two other selected projects (also performing well on sustainability and success) are evaluated without use of literature. After this stage, the data obtained is used to list those factors and mechanisms that play a role in these cases. This list is then tested by checking their presence in one successful but non-sustainable case and one case that is non-successful.

The method of interviewing is important for this study. However, no consensus is found regarding the most suitable type of interview. For instance, some researchers (e.g. Eisenhardt, 1989) suggest that interviews should be conducted with a limited amount of theoretical background and interviews should be unstructured in order to allow the data to guide the research. Others stress the use of a topic list and a solid body of background knowledge for the researcher (Miles and Huberman, 1994; Wester and Peters, 2004; Hollensbe et al., 2008). All authors agree that theory should not play a dominant role in the initial phases of the research project. Because of the limited time and experience available for this study, the methodology of Wester and Peters (2004) is followed and a more detailed topic list is developed. This list ensures that the possibility of cross-case evaluation is maximized and all projects are evaluated on roughly the same variables. However, some literature on the topic of NPD success factors needs to be reviewed in order to develop this topic list.

Data analysis
Different from many other business problem solving studies literature is not the starting point of this analysis (Eisenhardt, 1989; Van Maanen, 1982). Literature is only used in order to develop an interview structure, and to evaluate factors that have been proven to play a role in NPD projects. After a theory is developed from empirical data, or when it is obvious no theory can be developed from these data, literature is used for validation. The collected data from the interviews is analyzed by means of transcribing and coding. Per interview, the data is transcribed and coded, in order to get thorough understanding of the data collected and the importance of the factors playing a role in these cases (Yin, 2003). Then, case wise, individual case reports are developed to analyze the data for every individual case. These cases are then evaluated in order to find structures they have in common. This method of analysis is depicted in figure 5 and explained below.

1. Interviews
Above, the procedure of selecting cases and respondents for the interviews is described. From each of the selected cases, two or three persons are interviewed and project documentation is studied. To cover the entire NPD process, the interviewees included a R&D professional, the project leader and one person involved in the marketing of the product. Interviews, all lasting for approximately one hour, are guided by the developed topic list. Furthermore, the interviews are recorded. To gather stable and exact data, the interviewees are asked to provide documentation and whether they could be contacted for additional information, later in the project (Yin, 2003).
2. Transcripts
Apart from introduction and closing statements all the interviews are transcribed. These transcripts are expanded with further case documentation such as internal and external publication, website information and project guidelines.

Figure 5: Stepwise analysis of data (based on Harry et al., 2005)

3. Open coding
The transcripts are loaded in Kwalitan (version 5.0.150), a software program that supports coding and subsequent qualitative analysis (appendix D). By means of this software, it is possible to assign codes to certain text fragments. The first step is open coding of all interviews (Van Aken et al., 2007). In every interview, fragments are coded that are important in the context of the project. The goal of this open coding process is to explore the data and find as many as possible concepts that relate to the research questions (Wester and Peters, 2004). A coding dictionary is used in order to avoid coding similar fragments with different coding and minimize the risk of spelling errors during the process (Hollesbe et al., 2008; Asforth, et al., 2007). The coding is done for two cases at the same time and via an iterative process. First, the two pilot cases are coded. Then two additional cases are coded, after which the first two cases are reviewed again. Finally, the last two cases are coded, after which the first four cases are reviewed again. This procedure is used to ensure that no codes, emerging later in the process, are neglected during the coding of transcriptions that are assessed earlier in the process (Hollesbe et al., 2008). After this initial round of open coding, the fragments regarding project success are coded using different codes.
4. **Case reports**
The transcripts making up a single case are read and developed into a case description highlighting the important facts in the development of that case, e.g. the triggers for starting up the project, or the feasibility of the project and highlights during the development trajectory. Also, the respondents’ perceptions of the success and sustainability of the products is incorporated in these reports. In developing these case descriptions, additional documentation is reviewed, like publication, NPD policies, etc. Based upon this information, a case analysis is made, highlighting the findings within the specific case.

5. **Category development**
To assess the level on which different codes actually refer to the same event or success factor, categories of codes are developed. By making categories it is possible to get better insight in the underlying structure of the codes. The different codes are summarized into different categories. After developing these categories, the underlying fragments are assessed to ensure that the coded fragments still fit their coding categories.

6. **Theme development**
The next step of analyzing the data is to develop a number of main themes out of those categories. The fragments in every theme are counted and the themes are ranked on their relevance (based on the number of fragments) for the research. Then the themes are compared with case descriptions. The process of developing text fragments into codes, categories and finally themes is shown in figure 6.

The next step of analyzing the data is to develop a number of main themes out of those categories. These themes are ranked on their relevance for the research. The number of fragments in every theme is counted, and the themes are compared with case descriptions. The process of developing text fragments into codes, categories and finally themes is shown in figure 6.

![Diagram of theme development](image)

**Figure 6: Theme development**

7. **Selective coding and assessing fragments underlying themes**
After segmenting the data, the relationships between the different themes is assessed. The focus here is on whether and how CSR influences the different themes and by that NPD success. To evaluate the relation, a two way approach is used. First, all fragments underlying a certain theme are reviewed, to evaluate whether these relate to other themes. Furthermore, using the software, it is evaluated which fragments are present in more than one theme. These overlaps between themes are studied to identify possible relations.
After segmenting the data, the relationships between the different themes is assessed. First, all fragments underlying a certain theme are reviewed, to evaluate whether these relate to other themes. Furthermore, using the software, it is evaluated which fragments are present in more than one theme. These overlaps between themes are studied to identify possible relations. The focus here is on whether and how CSR influences the different themes and by that NPD success.

8. Relation development and testing
To evaluate the relation, a two way approach is used. The relations found are compared with the case descriptions to find out whether these relationships can be embedded in those descriptions. Also, the relations are verified by investigating NPD project documents, internal documentation, rules and procedures to find out which aspects can be found, embedded in the NPD process. Together, these may give evidence of the relation between CSR and NPD project success.

9. Theory development
After the analysis of the data, the research questions are answered. Together, these answers form the basis of a theory, discussing the influence of CSR orientation on innovation projects. This theory is first developed in the form of hypotheses and finally in a model that can be validated in future research. To ensure that the theory emerging from the data is robust and expands existing knowledge, recommendations from Sudabby (2006) are followed. This author argues that it is critical to compare findings with existing and adjacent literature to strengthen the findings, to obtain additional insight and to enable a better interpretation. Both qualitative and quantitative literature is used to validate the success factors found and linked to the CSR policies. When available also conflicting literature is evaluated to increase the reliability of the theory (Eisenhardt, 1989). This model is the final delivery of this study. From the firm perspective, the insight can be used for strategic direction towards the structure and use of CSR policies in internal and external operations.

Deliverables
The theory developed is the most important deliverable of this study. Based upon the insight this theory provides, recommendations for DSM are given. Furthermore, the implications it has for practitioners and researchers are evaluated. How practitioners can use the findings and interesting directions for further research is recommended.

3.3 Intermediate conclusion
This section evaluates the design and methods of the study. Because of the exploratory nature of the study, cases are used as primary source of data collection. Two or three respondents from six different NPD projects are interviewed. Four of these projects have to score relatively high on sustainability and success, one relatively high on success but low on sustainability and one high on sustainability but low on success. Furthermore, the methods of data analysis and the deliverables of this study are discussed. Two important observations are made. First of all, the development of an interview framework is important to support data collection and ensure comparability between the interviews. Furthermore, the importance of a pilot study is discussed. Doing a pilot study is found important to ensure that the data collected would be useful in achieving the research objective in the timeframe available for the study. Therefore, the next chapter discusses the development of an interview framework and the set up and execution of the pilot study.
4 Preparations and Pilot Study

In the previous chapter, the importance of developing an interview framework was discussed and the need for a pilot study was identified. This chapter addresses these two themes. First, based upon literature, an interview framework is developed. Then the methods and results of the pilot study are discussed. Based upon the findings in this pilot, adaptations in the data collecting and analysis are described.

4.1 Interview framework

To develop an interview framework as a checklist for the interviews to assure usable data are collected, two characteristics are important. First, the framework has to focus on topics closely related to the research objective. This increases the chances that the collected data address this research objective. Next to that, to refrain from leading the respondent by directly addressing the research topic, the framework may not address the objective directly (Gamble and Gibson, 1999). Examining the research model (figure 7), NPD drivers and their influence of success are found to be the best topics to build the interview framework upon, because:

1. A large number of drivers of NPD success is described in literature. By developing these in an interview framework, the framework is likely to be broad enough to address the categories of NPD drivers, without addressing the individual drivers.
2. These topics are important in this study, but do not address the research objective directly (CSR is not taken into account in the interview framework).

![Diagram](image)

Figure 7: Relationship between research model and interview framework

Before focusing on these drivers, it is important to start with defining NPD success. In most scientific literature, NPD performance is measured by variables such as project profitability (e.g. Cooper and Kleinschmidt, 1995; Dwyer and Mellor, 1991), market share (e.g. Cooper, 1990; De Bretani, 1989), sales volume (e.g. Song and Parry; 1997) or managerial perception (e.g. Balbontin et al., 1999). Next to the financially induced measures, some researchers also looked at NPD success in terms of NPD innovativeness (Calantone, 2006) and/or NPD sustainability (Pujari et al., 2003; Pujari, 2006). Both were found not found to be correlated with financial success measures, although NPD activity in general is found to be important in achieving success on corporate level (Capon et al., 1990; Danneels and Kleinschmidt, 2001). However, the drivers proposed to be influential for NPD innovativeness and sustainability are mainly also important drivers in NPD financial success. Therefore, NPD success in seen in the traditional way of financial success when searching for literature on NPD success drivers.
In literature, many articles have emerged describing the New Product Development process. A popular theme in these articles is how to distinguish successful NPD trajectories, from the non-successful ones. Numerous researchers have investigated which drivers are important for these projects and to what extent they influence the outcome of the process. Although researchers generally agree that no single set of drivers can be expected to determine the exact outcome of a NPD project, certain drivers are consistently found to play a major role in the process. These drivers were identified by comparing leading empirical articles in the field. Ernst (2002) and Cooper and Kleinschmidt (1995) identify five categories of success drivers in NPD projects. These categories mainly focus on the firm’s internal operations and not on its supply chain partners. Recently, researchers (e.g. Faems et al., 2007) also point out that relations with other organizations are important for NPD. Therefore, one additional category was added, evaluating these partners. Per category, a number of empirical studies demonstrating the relevance of the category are given. When not indicated, the data used emerges from the meta-analysis of Ernst (2002)

Category 1: Clearly defined NPD process
The first important characteristic of NPD is the process itself. This process facilitates regarding the NPD project and thus ensures activities like product screening, go-no go decisions and reducing the chances of investing in products or ideas that cannot be commercialized. Specifically, elements of the process positively influencing NPD success were found to be:

- Planning of the project; focus on technical feasibility, target market and relative advantage as opposed to competitors (e.g. Baker et al., 1986; Bastic, 2004).
- Continuous commercial assessment of the project during the entire process (Dwyer and Mellor, 1991).
- Orientation towards market needs (Balbontin et al., 1999; Cantalone and Di Benetto, 1988; Langerak et al., 2004; Kandemir et al., 2006).

Category 2: Organization
A second category was found to be the organizational attitude towards NPD processes. This includes variables concerning teams, team leaders and their attitude. Especially important were found to be:

- Use of cross-functional teams (Di Benetto, 1999; Kandemir et al., 2006).
- Team leader (Balachandra and Brockhoff, 1995; Balbontin et al., 1999; Souder et al., 1997, Thieme et al., 2003).
- Clear team roles and responsibility (Bessant and Francis, 1997; Cooper and Kleinschmidt, 1995).
- Team (leader) commitment (Kandemir et al., 2006; Thaimain, 1990).
- Internal communication (Ebadi and Utterback, 1984).
- Type of project management structure (Bessant and Francis, 1997).

Category 3: Senior Management
Also support and resource allocation by senior management are drivers of NPD success. Projects need sufficient resources and support in order to for instance adequately assess the market. Research demonstrates that when managers are more committed to a NPD process, the process is more likely to be successful (e.g. Cooper and Kleinschmidt, 1995; Maidique and Zirger, 1984, Thieme et al., 2003).

Category 4: Strategy
A fourth category relates to the overall strategy of the organization towards NPD. This category is primarily concerned with the synergy between different NPD projects. Various authors have found that firms with NPD projects that focus on areas in which the company already has activities, are generally more successful (e.g. Cooper and Kleinschmidt, 1996). The
same holds for the long-term commitment of the firm to NPD efforts and definitions of the goals of the process (Cooper and Kleinschmidt, 2004).

**Category 5: Culture**
The cultural attitude in organizations was also found to be of importance for the success of NPD projects. For example, an entrepreneurial climate was found to be positively related with new product development success (Cooper and Kleinschmidt, 1996). Also, the emergence of product champions is mentioned as example of organizational culture, influencing NPD success (Balanchandra and Brockhoff, 1995; Song and Parry, 1997).

**Category 6: External partners**
In recent years, it has become apparent that the involvement of other parties in the NPD process is also crucial. For example, Lagrosen (2005) and Fang (2008) argue for the involvement of customers in order to increase NPD success, whereas Van Echteld et al. (2008), Wagner and Hoegl (2006) and Wynstra et al. (2003) argue for the involvement of suppliers. Other authors even suggest the involvement of other third parties for information gathering and market knowledge (Di Benetto, 1999; Knudsen, 2007). These findings suggest that besides internal variables, also external parties are important in NPD project success.

These categories will only serve as a guide for the interviews to be conducted. The NPD process is generally considered to be too complex to present in one general framework (Hauschildt in Ernst (2002)). Therefore, although the framework (figure 8) can guide the interviews, the interviews will be leading in which drivers are retained and which are discarded.

![Figure 8: Interview framework](image-url)
The six categories defined above are not covering the entire process nor are mutually exclusive (e.g. cultural variables can be expected to play a role in organizational variables as well), but they do provide an overview of important activities in NPD process. This framework is not used explicitly in the interview (Appendix E), but serves as framework for the interviewer. All respondents will be asked to evaluate what contributed to the success of the project. They are asked to identify those drivers that played a significant role in achieving this performance. The advantage of the use of the framework developed above is that it can direct the respondent sufficiently to make interviews mutually comparable, but does not lead the respondent, because the (first level) categories are rather generic and not mutually exclusive.

4.2 Pilot study
The second observation in the methods section was the need of a pilot study. This pilot will be used to:
- Confirm the research methods (such as the interview length, number of respondents per case, use of the research framework developed).
- Control whether the interviews and cases are comparable. If not, the research methods have to be adapted.
- Develop a format for the data analysis, e.g. which rules have to be used in order to decide which text fragments will be coded or not.

Two cases were identified by means of the introduction interviews and internal publication on the DSM intranet. For both cases, project managers were asked to participate in the study and to identify other employees that were involved in the development trajectory and launch of the product. In the description of both cases, following Yin (2003) and Eisenhardt (1989) first a within case evaluation is done. Due to the limited amount of data per case, these within case descriptions are done based on the transcripts of the interviews. Next the possibilities for cross case data analysis are discussed.

4.2.1 Procedures for transcription and coding
The recorded interviews are developed into transcripts. All questions and answers (with exception of introduction and closing statements) were typed out literally and were fed back to the respondents. After this, they were loaded into a software program for electronically coding (see also Wester and Peters, 2004). As stated earlier, the transcribing and coding is important for ensuring thorough understanding of the material. For analysis, the coding is only used in the cross-case analysis, when the amount of data is too large to consider every interview separately.

4.2.2 Analysis of case 1
Case 1 was selected because of the publicity it received in the DSM sustainability report and on the DSM website. The project concerned the development of a new form of antireflective coating that could be used on glass. This coating makes that more light passes through the glass (99% instead of 91%), which has two main potential advantages. First, less light is reflecting from the glass, which has advantages when the product is used in applications such as glass for framing pictures, helmets or car windshields. The second advantage, the larger amount of light passing through, has advantages in construction (brighter rooms) or solar panels (larger efficiency). The direct application of the product was in picture framing. The product was seen as both sustainable (consumed only 50% of the energy its competitors used) and successful (the product was developed in a very short time and the plant build for the production of the material was already sold out).
Data collection
Data collection took place by means of three interviews (a R&D professional, the project leader and the business manager). The length of all three interviews was approximately one hour, of which two were done in Dutch and one in English. All interviews were taped. Furthermore, website documentation was obtained and the underlying NPD process was studied.

NPD Process description
The technology of making antireflective coatings for plastics was already present at DSM Desotech for several years. Its major application was use for laptop and TV-screens. When it became apparent that one of the mayor research partners of DSM Desotech was planning on acquiring the specific division and its technology, DSM researchers started working on a different application of the technology in order to keep it in house also after the acquisition. With the assistance of an external PhD. student, the researchers succeeded in making an (initial) prototype, which convinced management to go on with the technology.
Although the number of potential markets was considered to be huge, the NPD team focused on developing the product for a small and “simple” market. The market of anti-reflective art & picture frames was chosen because of a number of reasons: First, it was a market that could be served with one or two small pilot plants. It would give the production team some time to optimize the processes and scale up step by step. Second, it is a market in which the glass is only used indoors. This means that no extensive durability tests are needed in order to access the market.

Making the technology actually work was a difficult process. From prototype to prototype, the technology improved, but did not meet expectations of consumers and the NPD team itself. A number of times, the project was hanging by a thread, but they managed to convince top management over and over again to that the project was worth supporting (which they partly did because future application e.g. on solar panels was so promising). During the development trajectory, researchers mentioned that they had never experienced such a positive commitment of the team. Nobody seemed to care about working late or in weekends. Also, during the development trajectory, the cross-functional team scanned the market and value chain. Although they could only develop the coating (and DSM had no knowledge or experience producing glass) they found that the main step in the value chain was from coating to coated glass. To do this, suppliers needed to be involved, especially related to safety issues. Therefore, they started developing the competence and facilities to buy and coat glass themselves. During this time, the team also contracted two external consultants; one specialized in the glass and art market, the other one specialized in the technology. When approaching market entry, they were still not fully assured that the product would outperform other players.

Months before the product launched, the team encountered another technology which could potentially outperform their own. They decided to change technology radically, although their factory was already in place. Furthermore, the team focused on having a better production process than their competitors. They succeeded, developing a production process that consumes 50-60 percent less energy than their competitors. The launch was phased in order to allow production to slowly build up capacity and learn while doing. During that period customers needed to be involved to convince them about the functionalities of the product. Simultaneously, numerous challenges had to be faced within the factory, while also a large number of savings was identified. At the moment of the interview, the new product was launched and the initial success was obvious.
**Important project drivers**

Table 3 lists the drivers respondents indicated as influential in the project. These are largely in line with literature about NPD, as discussed in 4.1. Appendix F lists the complete list of indicated drivers for project success in case 1 illustrated with sample quotes.

<table>
<thead>
<tr>
<th>Indicated Drivers influencing NPD success</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Supplier involvement</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Customer involvement</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Team (leader) commitment</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Business model</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Cross-functional teams</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Top management commitment</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Third party knowledge</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Long term goals</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Role of CSR in the NPD process**

All three respondents indicated that sustainability was not the primary trigger or driver of the project. They all indicated that the drive towards CSR influenced their daily routine and thus the project. It was noticed that the way in which this influence took place was twofold.

1. A number of formal regulations was embedded in the NPD process. At each of the gates of the process, the Go/No Go decision on continuation of the project was made by the team and management. Primarily, this decision was made based on financial parameters, such as the expected return on investment (ROI), market share, sales volume and time to market. But at almost all gates, there was also a checklist on CSR issues. This checklist needed to be completed in order to go to the next stage of the process. Examples of questions here were to what extent the team had checked the sources and suppliers of the materials they bought, the end markets in which their products would be used and to what extent the team could reduce the intake of raw materials, energy and waste materials. Not all respondents indicate that they were heavily influenced by these questions and that is was hard to complete all questions, especially because it regarded a new product without any reference. Still, the presence of these questions influenced respondents. This type of influence was labeled as ‘the formal CSR orientation of the company’.

2. Respondents also indicate that their CSR orientation was present in less formal ways. By means of articles in corporate newsletters, the intranet, board memo’s etc, the company stated their commitment to CSR quite often. Also employees were stimulated to participate in workshops, lectures etc to increase their awareness on the topic. Finally, the company actively stimulates and controls the activities of their employees on safety, health and environment (SHE) topics, which are part of their annual performance review. Together, this form of CSR orientation was not directly impacting the respondents, but did increase their awareness of CSR. This type of influence on the respondents was labeled as ‘informal CSR’.

The formal and informal CSR orientation influenced the project. Although the project was not started out of CSR considerations, some of the indicated drivers of product success were found to be influenced by it (table 4). For example, two out of three respondents indicated that supplier involvement was now more important than a couple of years ago. They stated that because DSM’s drive towards more sustainable products, suppliers were now more closely monitored and involved in product development to ensure safety and avoid reputation damage caused by malpractices of suppliers. In the same way continuous improvement,
market orientation and top management commitment were found to be influenced by the CSR orientation by one or more respondents.

### Table 4: NPD drivers influenced by CSR orientation in case 1

<table>
<thead>
<tr>
<th>Drivers influenced by CSR orientation</th>
<th>Respondent</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A  B  C</td>
<td>&quot;In order to come up with products that are accepted by the market, you really need to listen to the market, that is the most important variable. Not only to our direct customers, but also to their customers. You see that our focus on sustainability and that of the market are quite similar.&quot;</td>
</tr>
<tr>
<td>Market orientation</td>
<td>X  X  X</td>
<td>&quot;Safety is of key importance in our projects. For example, our new glass supplier was closely involved in the production process, because we do not know anything about it. We need their knowledge in order to use the material safely.&quot;</td>
</tr>
<tr>
<td>Supplier involvement</td>
<td>X  X  X</td>
<td>&quot;That incentive to lower energy and materials, that’s in your system from the very beginning.&quot;</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>X  X  X</td>
<td>&quot;If you work sustainable you get support, is as easy like that.&quot;</td>
</tr>
<tr>
<td>Top management commitment</td>
<td>X  X  X</td>
<td></td>
</tr>
</tbody>
</table>

#### Conclusion pilot case 1

Based on the analysis above, some observations regarding the research objective can be made. The trigger to start the project was not CSR driven. The project was started to avoid knowledge leaving the company as result of a disinvestment. However, certain drivers important to NPD success were found to be influenced by the CSR orientation of the company. This is depicted in figure 9. The other drivers for NPD success (table 3, are not listed in this figure)

![Figure 9: Relation between CSR and NPD success in case 1](image)

#### 4.2.3 Analysis of case 2

Case 2 was selected because one of the innovation managers in the orientation interviews indicated that the project might be suitable for the project. It handles a laser additive of DSM. It is a small ball of several microns big, which can be added to a plastic. When intensely lit, it
will change color (i.e. become black). By adding the product to polymer granulate, it is possible to laser mark the plastic object, even if the polymer itself is not laser mark able. The project was initiated by the DSM laser service center, but was not in the scope of this department and thus transferred to the innovation center.

Data collection
Data collection took place by means of two interviews (one R&D professional and at the same time project leader, and the business manager). Both interviews were in Dutch and were taped. Product folders and website documentation was obtained and the underlying NPD process was studied.

NPD process
The project was started because the workload of the department was decreasing, and additional sources for revenue needed to be found. This specific project was chosen because there were a number of customers asking for it. They wanted to move away from inkjet printing because of the polluting solvents related to it. Besides that, laser printers can theoretically outperform conventional printers.
Switching from conventional to laser printing can offer some clear advantages for companies. For example, laser marking is faster than inkjet printers, it is possible to print in e.g. cavities, it does not faint, reduces the possibility of the product coming into contact with ink, etc. For these and other reasons, companies are switching to laser marking their products. The bottom line here is that laser marking is done within a product, whereas traditional marking is often done on the product. Thus, laser marking stays on a product forever, whereas inkjet marking will fade over time.

When the idea was developed and theoretically tested, the researcher could immediately start testing, because all the facilities were nearby. The first test immediately delivered the results they wanted, and thus a marketable product. The number of potential market application was huge. DSM was not directly involved in these markets. Although the company has some plastics business, the approach that was needed here was different. What made it particularly difficult was that a number of parties needed to be involved to make the product successful. For example, the laser manufacturer, material producer and the company actually using the laser marking technology all had to see benefits in using the product. To achieve this, the NPD team sought extensive cooperation with the world’s leading laser manufacturers. Also, there were problems with the product itself. Although the initial product worked, it was actually performing too slow, becoming a bottleneck in the production. By means of constant development, the team succeeded in developing four generations of which each was two times faster than the previous.

After trying out almost every imaginary market (which took a couple of years), the team decided to focus on a number of markets in which laser printing was already standard. Next to that, they choose to develop two or three additional markets, in which their technology really had a competitive advantage. Suppliers were also found to be important in the process. The entire product depends on the quality of its ingredients. If the suppliers cannot produce this, the product does not function properly. Because of the research facilities available, commercial sale of the product already began before a real production facility was available. No real decision has been made here. DSM tried to sell the start-up company, but this did not succeed. Two options are thus evaluated: moving the production to one of the suppliers, or creating an own production location. Still, DSM is not sure what should be done with the business.
Drivers for project success
The main drivers of NPD success are depicted in table 5.

Table 5: Drivers influencing NPD success in case 2

<table>
<thead>
<tr>
<th>Indicated drivers influencing NPD success</th>
<th>Respondent</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Supplier involvement</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Clear Process</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Customer involvement</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Business model</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Cross-functional teams</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Top management commitment</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Role of CSR in the NPD process
Similar as in case 1, a distinction between the formal and informal CSR orientation of the company was found. This is not surprising, due to the fact that both projects are placed in the same organization. The formal and informal CSR orientation influenced the project. Although the project was not started out of CSR considerations, some of the indicated drivers of product success were found to be influenced (table 6).

Table 6: NPD drivers influenced by CSR orientation in case 2

<table>
<thead>
<tr>
<th>Drivers influenced by CSR Orientation</th>
<th>Respondent</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>X</td>
<td>“We need to make sure our products is not bad for our customers, therefore, we need to sit together with our customer and end-consumers, to get insight in how these parties use our product.”</td>
</tr>
<tr>
<td>Supplier involvement</td>
<td>X</td>
<td>“This heavy metal we are using is partly against our principles and those of a limited number of our costumers. We need to cooperate with our supplier to get those substances out of our product.”</td>
</tr>
<tr>
<td>Customer involvement</td>
<td>X</td>
<td>X “We need to make sure our products is not bad for our customers, therefore, we need to sit together with our customer and end-consumers, to get insight in how these parties use our product.”</td>
</tr>
</tbody>
</table>

Conclusions pilot case 2
Based on table 5 and 6 some observations regarding the research objective can be made. Again the project was not initiated out of CSR considerations. The project was started because R&D professionals saw a market opportunity and had the time available to explore this. Again certain drivers important to NPD success were found to be influenced by the CSR orientation of the company. This is depicted in figure 10.
4.2.4 Possibilities for cross case evaluation

On of the main goals of the pilot study was to assess whether cross case evaluation was possible. From the figures 9 and 10 and tables 2-6 above, it can be concluded that both cases are comparable. In both cases, drivers of NPD success were found and also the company’s CSR orientation is of influence. The respondents indicate a distinction between the formal rules and regulations they needed to follow and the more informal communication regarding the commitment to CSR. The structure of the cases is comparable, as the underlying process is identical. Therefore, no problems are expected in the cross-case analysis.

4.3 Validation of interview framework and methods

As described in 4.2, one of the reasons of a pilot was to control whether the proposed research method was suitable to obtain the insight needed in the NPD project. The structure of the interview as well as the interview framework were satisfactory. It provided enough background to completely cover the project, while giving the respondent sufficient freedom to lead the interview. The drivers derived from the literature study however, where found not to be optimal for the interview. For example, culture organization was perceived as being interrelated. Because of this, the drivers were regrouped within the framework to fit the perceptions of the interviewees (figure 11). ‘Team and team leader’ is introduced as new topic, and ‘organization and culture’ are combined into one topic. The interviews also revealed drivers that were not discussed in the literature study, such as ‘the need for flexibility in the process’ and ‘goal orientation’. This shows that the framework proposed was not leading the respondents and important drivers are likely to be derived from the interviews. In figure 11, the additional drivers mentioned by the respondents are bold. The drivers that did emerge from the literature study but were not mentioned by the respondents are stroked through. Furthermore, regarding the workload the data collection methods (interviews and additional documentation), six case studies were found to be an attainable goal. The additional value of three versus two interviews was not very high, although the fact that respondents could cover the entire NPD project was found to be important. This will be the main criterion for interviewee selection in the follow-up cases.
4.3 Intermediate conclusion

In this section, an interview framework was developed. Furthermore, a pilot study was conducted to validate the methods of data collection and analysis. This pilot consists out of two NPD projects, which are studied and analyzed. A number of conclusions is drawn from this pilot. The use of the interview framework was useful to collect data from the interviewees. Some adjustments are made to further optimize the framework. The data collected from the cases can be analyzed and brings promising insights. Furthermore, the cases were found to be suitable for cross-analyzes.

Together this proves that the research methodology as outlined in chapter three functions as is was expected to do. It allows the respondent to lead the interviews (rather than the interviewer), but enables the interviewer to cover a number of important NPD process topics (i.e. process, team & team leader, senior management, project strategy, culture & organization, external parties). Because only these general topics are brought in to the conversation if they are not addressed by the respondents themselves and examples are asked for each for the NPD success factor the respondents bring up, the risk of leading the respondent is minimized. The fact that certain topics are seen as important by some respondents but are not seen as important by others confirms this claim. By doing this, this study can be argued to be fully theory building, with only one adjustment to avoid the problem of ending up with interview transcriptions that are not cross comparable. Because no important adjustments in research design or methods are made, the results from the pilot study can be used in the cross case analysis and theory development.
5 Data Analysis
This section analyzes the collected data based on the methodology developed in the previous chapter. First, the four remaining cases are separately evaluated. Then, using a coding procedure, a cross-case analysis is done to compare the data over the different cases.

5.1 Within case analysis
The pilot cases are described in the previous chapter and are not addressed here. The remaining four cases will be evaluated. A more thorough description and analysis (as was done with the pilot cases, can be found in appendix G). Here, first the two remaining cases that were seen as both successful and sustainable are evaluated, and then the two conflicting cases are analyzed.

5.1.1 Case studies scoring high on success and sustainability
As described in the research methods, two more sustainable and successful projects were selected for this study.

Project selection and data collection
The two cases were selected because they were listed in the DSM sustainability report (2007) as example cases and were recommended during the introductory interviews. Furthermore, the received attention on the DSM intranet, because of awards won and sales exceeding expectations. From both projects, two respondents were interviewed because the project leader and business director functions were integrated during the NPD process.

Project descriptions
One of the case handled the development of an enzyme that could help to regulate blood pressure of consumers. By coincidence, a DSM scientist came across a scientific study describing the development of enzyme useful for blood pressure regulation. This scientist believed that one of DSM’s technologies to make similar enzymes was more efficient to develop the specific enzyme and started testing. Launched in 2008, the product is now used in dairy and fruit juices. Furthermore, it is used in food supplements.

The second case also concerned an enzyme, but now for use in the beer industry. In the same way as the previous case, one of the scientists at DSM read an article in which the problem of haze in beer was described. DSM had the specific technology to develop a enzyme solving this problem. A DSM team developed this enzyme and introduced into the brewing industry. At first, the product was not really successful. After some improvement versions, DSM found that the product in slightly modified form could also be used to shorten process time of the brewing process and save a large amount of energy. In 2008, the product was put on the market in the new form. More detailed descriptions of these cases can be found in appendix G.

Drivers for project success
The drivers listed by the respondents were consistent with the drivers derived from the literature study and the pilot cases (table 7). One driver was not considered earlier, and needs some further explanation. Respondents indicated that one of the main reasons for NPD success was the fact that a solid body of knowledge regarding certain technologies was already present in the company. They indicated that the technology used in the project was not new, but only the team’s application of the technology was. Respondents stated that without understanding of these underlying technologies, it would not have been possible to develop the product. Therefore, technology platform was adopted as one of the drivers of NPD success.
Table 7: Drivers influencing NPD success in case 3 and 4

<table>
<thead>
<tr>
<th>Indicated drivers influencing NPD success</th>
<th>Respondent</th>
<th>Case 3</th>
<th>Case 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Supplier involvement</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clear Process</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Customer involvement</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Business model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-functional teams</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team (leader) commitment</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Top management commitment</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Third party knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology platform</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Long term goals</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Role of CSR in the NPD process
In both cases CSR was not found to be the trigger in the development of the process. Consistent with the case studies in the pilot, CSR did have an influence on a number of drivers of NPD performance. These drivers are listed in table 8. The quotes stated reflect new actions NPD teams have taken because of the company’s CSR orientation. This orientation (see e.g. appendix L) stimulates the teams to take CSR into account during the NPD process. These two cases confirmed the formal as well as the informal CSR as also found in the pilot. One additional finding was that because of the CSR orientation of DSM, scientists were triggered to explore certain technologies. So even though the projects were not triggered by the CSR orientation of DSM, respondents indicated that other projects were partly triggered because of this orientation.

Table 8: NPD drivers influenced by CSR orientation in case 3 and 4

<table>
<thead>
<tr>
<th>Drivers influenced by CSR Orientation</th>
<th>Respondent</th>
<th>Case 3</th>
<th>Case 4</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>X</td>
<td></td>
<td></td>
<td>“Although it is always important to focus on the effect of a product, we now should take extra care of this. How do customers use our product?”</td>
</tr>
<tr>
<td>Supplier involvement</td>
<td></td>
<td>X</td>
<td>X</td>
<td>“We send quality and R&amp;D professionals to our suppliers to control whether they work according to our standards.”</td>
</tr>
<tr>
<td>Customer involvement</td>
<td>X</td>
<td>X</td>
<td></td>
<td>“By means of the Life Cycle Analysis, we now understand our customers better than they do themselves. We can really help them to reduce costs.”</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>X</td>
<td></td>
<td></td>
<td>“We started to look how we could improve our own plant. I would say it’s fairly optimal now.”</td>
</tr>
<tr>
<td>New projects</td>
<td></td>
<td>X</td>
<td></td>
<td>“I’m now trying to find out whether we can make bio-based products that can solve some of the food problems in the world.”</td>
</tr>
</tbody>
</table>

5.1.2 Conflicting cases
As described in the research methods, two conflicting case studies were selected to follow up the four sustainable and successful cases described above. One of these cases had to be successful, but not sustainable, and the other one had to be sustainable, but not successful.
Project selection and data collection
The first case was selected because it was promoted as highly sustainable in internal documentation. However, respondents in the orientation interviews indicated that sales were below expectations. Therefore, it is labeled as sustainable but not successful case. From this case, three respondents were interviewed in Dutch. The second case was selected because it did not mention sustainability at all on the project website and was present in notorious industries, such as paper and oil. At the same time, it was indicated to be rather successful. From this case two respondents were interviewed, because the project manager was recently appointed and indicated to know little about the NPD trajectory.

Project descriptions
One project was about the development of a new series of binders for decorative paints. Due to regulations, new binders have to be developed to stay competitive within the market. New laws were therefore a trigger to start the project. Using available DSM technology from elsewhere in the company, the NPD team succeeded in developing binders that had much lower solvent levels than required by law. Costumers however, were not prepared to pay the price premium for this and refused to use the product or decided to mix in with less costly systems, thereby ruining the performance. A new line of binders was developed in the first half of 2008 and is now hitting the markets. Thus far, sales have not been as big as expected. The other project handled a technology for making molecules that have the same characteristics as dendrites; multi-branched molecule structures for use in a wide variety of application. The original technology was developed because dendrites are very costly to produce. The product itself is now used in paper industry and oilfield chemicals. In some of these markets it can be seen as sustainable. At this moment, the technology is generating quite some turnover, but not as much as was expected when the technology was developed initially.

Drivers for project success
The drivers of NPD success as indicated by the respondents (table 9) did not differ from those of other projects. Therefore, they are only listed and not further explained.

Table 9: Drivers influencing NPD success in case 5 and 6

<table>
<thead>
<tr>
<th>Indicated drivers influencing NPD success</th>
<th>Respondent</th>
<th>Case 5</th>
<th>Case 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Supplier involvement</td>
<td>B</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clear Process</td>
<td>C</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Flexible Process</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer involvement</td>
<td>E</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Team (leader) commitment</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Business model</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal orientation</td>
<td>G</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cross-functional teams</td>
<td>H</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Top Management commitment</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third party knowledge</td>
<td>J</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Technology platform</td>
<td>K</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>L</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Goal orientation</td>
<td>M</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Role of CSR in the NPD process
Contrary to expectations, the fact that these cases were selected on different criteria than the first four could not be noticed in the interviews. In both cases respondents indicated that CSR
had a prominent place on their agendas. The case that was indicated as non-successful was seen as a succeeded NPD project, but was not yet generating the anticipated sales because regulation did not make other products obsolete. Furthermore, the economic turndown had a major influence on this product. The non-sustainable product was found to have sustainability prominent on its agenda. Respondents indicated that this was necessary in today’s market. “Non-sustainable products don’t exist anymore”, one respondent stated. The reason why the case did not advertise with CSR was that they only supplied a fixed number of customers, which were all aware of these benefits. In short, the selected cases did not provide a lot of different material than the first four, but were added to the sample because they were as much as the other ones NPD projects which were influenced by the company’s CSR orientation (table 10).

### Table 10: NPD drivers influenced by CSR orientation in case 5 and 6

<table>
<thead>
<tr>
<th>Drivers influenced by CSR Orientation</th>
<th>Respondent 5</th>
<th>Respondent 6</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market orientation</td>
<td>X</td>
<td>X</td>
<td>“To be sustainable, we need to know what consumers want. We really need to get out there and find out.”</td>
</tr>
<tr>
<td>Customer involvement</td>
<td>X</td>
<td>X</td>
<td>“We cannot develop a green product alone, we need to involve our customers and help each other.”</td>
</tr>
<tr>
<td>Team (leader) commitment</td>
<td>X</td>
<td>X</td>
<td>“People really want to be part of such projects. And so do I.”</td>
</tr>
<tr>
<td>Top management commitment</td>
<td>X</td>
<td>X</td>
<td>“I really believe that green products are more likely to pass some gates than others.”</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>X</td>
<td>X</td>
<td>“We keep on working on the formula, if we can improve just a little bit, that’s still a little bit.”</td>
</tr>
<tr>
<td>New projects</td>
<td>X</td>
<td>X</td>
<td>“Together with one of our suppliers, we started a project to build paint from bio-based materials. That is where we need to go to.”</td>
</tr>
</tbody>
</table>

### 5.1.3 Conclusion

The within case analysis of the case studies was initiated to get better understanding of the data collected. A number of observations can be made, which are used as a guideline in the cross-case analysis. Next to the NPD success drivers identified in the literature study and pilot case, one additional driver (i.e. development of a technology platform) was found and is used in further analysis. The CSR orientation was not found to directly trigger any of the projects studied. However, respondents indicated that some other projects were initiated at least partly because of this orientation. This is further assessed in the cross-case analysis. A number of drivers important for NPD success was reported to be influenced by the CSR orientation. The cross-case analysis has to focus on these drivers.

Interestingly, no clear differences emerged between the pilot cases and the latter ones. NPD products that seemed to be non successful or not very sustainable still found CSR playing a role in the process. This can be explained by the fact that legislation makes sure that products brought to the market, are conforming to certain standards. Non-sustainable products will thus be likely to be killed of early in the process. Success in turn, is influenced by a large number of factors, including market conditions, competitor performance etc. Therefore, in the cross case analysis, the differences between the different types of cases will be neglected. Also, no difference between the perceptions of different respondents (R&D vs. Project leader vs. Business manager) was found.
5.2 Cross-case analysis

The cross-case analysis is based on the steps outlined in chapter 3. Starting point is the open coding procedure. In order to determine which text fragments from the interviews should be coded, four basic rules were developed. Text fragments were coded if they matched one or more of the following criteria:

1. The respondent indicates that certain phenomenon is directly influencing the success of the NPD project. (e.g. “Management gave us clearly defined goal. That is really important. We knew where we were heading for and which requirements we had to meet”).

2. The respondent does not directly indicate the link between a phenomenon and the success of the project, but this link emerges from the context. (e.g. “We started involving marketing and business development professionals really early in the project. .... By then, they (marketing/business development) knew exactly were our technology was about, which made in way easier for them to target the right customers”).

3. The respondent indicates that a certain phenomenon is in hindsight found to have hindered project success probabilities and he would have done something different with his current knowledge. (e.g. “we fooled around to much with this product. We tried to apply it in more than 500 markets. Had we focused on certain market segments earlier, this product would be a couple of steps further in terms of sales”). Fragments in this form were coded by means of a positive code, in this example “early focus on limited number of market segments”.

4. The respondent indicates the influence of CSR on the project, even if this does not have a direct relation with the project success.

As noted earlier, all relevant fragments were coupled to a code. These codes were added to the coding dictionary. This ensured that a minimum of codes was needed to label all fragments, and the risk of using redundant codes was minimized. The open coding procedure produced the following results (table 11). The coding was done pair wise and via an iterative process. First, the pilot cases were coded. Then two additional cases were coded, after which the first two cases were reviewed again. Finally, the last two cases were coded, after which the first four cases were reviewed again. This procedure was used to ensure that no codes emerging later in the process were neglected during the coding of transcriptions that were assed earlier in the process.

<table>
<thead>
<tr>
<th>Case</th>
<th># Fragments related to NPD success</th>
<th># Codes</th>
<th># New codes developed</th>
<th># CSR related fragments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>106</td>
<td>89</td>
<td>89</td>
<td>27</td>
</tr>
<tr>
<td>2</td>
<td>83</td>
<td>73</td>
<td>61</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>127</td>
<td>82</td>
<td>62</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>92</td>
<td>56</td>
<td>55</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>126</td>
<td>78</td>
<td>34</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>109</td>
<td>59</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>643</td>
<td>314</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

A total of 643 fragments regarding project success were coded using 314 different codes, with the last of the two interviews in case six, only two more additional codes were added to the dictionary, which indicates that the coding structure is well on its way being fully defined (Glaser and Strauss, 1967). Additionally, 122 fragments related to CSR orientation were
coded. All codes were linked to their relevant text fragments for possible use later on in the process.

To assess the level in which different codes actually refer to the same event or success driver, categories of codes were developed. By making these categories it was possible to get better insight in the underlying structure of the codes. The 314 codes were summarized into 73 different categories (appendix H). In the process of generalizing the codes, seven codes (with in total 11 fragments) were neglected because they were found to be not contributing to project success after all. The case descriptions were used to determine whether different codes were actually referring to the same category and event. After developing the categories, the underlying fragments were assessed to ensure that the coded fragments still fitted the coding categories.

These themes were selected by using following criteria.
1. All relevant themes are backed by a substantial number of fragments. Themes with less than ten fragments are deleted from the analysis.
2. Furthermore, the presence of the codes over multiple interviews and cases was checked. When a certain theme was not present in more than half of the cases, it was also deleted from the analysis.
3. Finally, the themes should have significant influence on the project. To assess this, the themes were compared to the case descriptions. If a theme was not found as marking instance in any of the case description, it was also deleted from the analysis.

Using these criteria, six codes (21 fragments) were deleted from the analysis. Out of the 73 categories, themes were developed. An example of this approach can be found in appendix I. The themes developed were than ranked on their relevance for the research. The number of coding in every theme was counted, furthermore, again based on the inter case descriptions. The perceived relative importance was also taken into account. By means of this procedure, 15 final themes were developed (table 12). The most themes developed in the procedure are also found in the within case analysis. This indicates that the cross case and the within case analysis highlight the same drivers for NPD success. This is not strange, given the fact that in line with Eisenhardt (1989) data collection and analysis overlap. Three themes resulting from the coding analysis (i.e. Team leadership, prototyping and launch, communication), were not highlighted in the case descriptions. They were incorporated in the analysis based on the number of underlying fragments.

<table>
<thead>
<tr>
<th>Themes</th>
<th># Fragments</th>
<th>Present in # Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Market Orientation</td>
<td>80</td>
<td>6</td>
</tr>
<tr>
<td>2. Supplier Involvement</td>
<td>66</td>
<td>6</td>
</tr>
<tr>
<td>3. Technology Platform</td>
<td>56</td>
<td>6</td>
</tr>
<tr>
<td>4. Clear/Flexible Process</td>
<td>54</td>
<td>5</td>
</tr>
<tr>
<td>5. Third Parties (e.g. consultants)</td>
<td>54</td>
<td>4</td>
</tr>
<tr>
<td>6. Customer Involvement</td>
<td>44</td>
<td>6</td>
</tr>
<tr>
<td>7. Continuous Improvement</td>
<td>44</td>
<td>6</td>
</tr>
<tr>
<td>8. Cross Functional Teams</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td>9. Business Model</td>
<td>32</td>
<td>5</td>
</tr>
<tr>
<td>10. Team Commitment</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>11. Management Commitment</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>12. Team Leadership</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>13. Goal Orientation</td>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>14. Prototyping and Launch</td>
<td>20</td>
<td>3</td>
</tr>
</tbody>
</table>
The within case analyses indicated, that CSR orientation has an influence on NPD process in two ways; by influencing drivers for NPD success and by initiating new projects. Both these possibilities were assessed. To get insight in the direct relation between CSR and the development of new projects, all fragments with codes related to the theme CSR were combined and reviewed. Fragments expressing this direct influence were listed as evidence of this relation (table 13).

<table>
<thead>
<tr>
<th>Themes</th>
<th>#Fragments</th>
<th># Respondents (in different cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Market Orientation</td>
<td>6</td>
<td>4(3)</td>
</tr>
<tr>
<td>2. Supplier Involvement</td>
<td>14</td>
<td>7(4)</td>
</tr>
<tr>
<td>3. Technology Platform</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>4. Clear but Flexible Process</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>5. Third Parties (e.g. consultants)</td>
<td>1</td>
<td>1(1)</td>
</tr>
<tr>
<td>6. Customer Involvement</td>
<td>9</td>
<td>7(4)</td>
</tr>
<tr>
<td>7. Continuous Improvement</td>
<td>12</td>
<td>7(4)</td>
</tr>
<tr>
<td>8. Cross Functional Teams</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>9. Business Model</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>10. Team Leadership</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>11. Team Commitment</td>
<td>6</td>
<td>2(2)</td>
</tr>
<tr>
<td>12. Management Commitment</td>
<td>8</td>
<td>5(3)</td>
</tr>
<tr>
<td>13. Goal Orientation</td>
<td>1</td>
<td>1(1)</td>
</tr>
<tr>
<td>14. Prototyping and Launch</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>15. Communication</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td><strong>New Projects</strong></td>
<td><strong>5</strong></td>
<td><strong>3(3)</strong></td>
</tr>
</tbody>
</table>

To assess the relation between CSR and the themes that contributed to NPD project success, a twofold approach was used. First, a procedure of selective coding was used to code all instances in which the CSR policy was perceived to play a role in positively influencing one of the themes. Negative instances of CSR influence on the NPD drivers were not found. Also, all fragments underlying the different themes and their context were re-evaluated to assess whether or not the CSR policy had an influence on them.

The relations found were compared with the case descriptions to find out whether these relationships could be embedded in the descriptions. Also, the relations were verified by investigating NPD project documents, internal documentation (appendix J), rules and procedures (appendix H). Together, these give evidence of the relation between CSR and NPD project initiation or NPD project success.

The analysis shows several relations between CSR orientation and NPD success drivers. The most noticeable ones are:

- Market Orientation
- Supplier Involvement
- Continuous Improvement
- Team Commitment
- Customer Involvement
- Management Commitment

Fragments linking CSR to ‘goal orientation’ and ‘third party involvement’ were found, with for both drivers only one fragment. Also, a number of fragments linking CSR orientation to the development of new NPD projects were found. Therefore, New Project Initiation was added to the analysis, although it is not a direct driver of NPD success.
5.3 Intermediate conclusion

This section describes the data analysis steps and the development of relationships from raw data. Interview data and additional documentation is evaluated by means of within case and cross case analysis. Both analyses produce insights in the relation between CSR and NPD projects. The analyses also show, that the cases that were selected because they might produce conflicting results, did not really conflict with the other cases. This is understandable because cases that are non successful and non-sustainable are likely to be stopped at the early stages of the NPD process. Therefore, it is decided to evaluate the cases in the same way the other cases were analyzed, using them as additional data rather than conflicting data. Because of the different nature of the two types of analysis (within case versus cross case) the results of the two analyses can differ. For example, in the cross case analysis more examples of new project initiation were found than in the within case analysis. This can be explained by the fact that the within case analysis is based on perceptions of the researcher, whereas the cross case analysis is based on text fragments.
6 Results & Proposition Development

This section will use the data analysis to answer the research questions. First, the four sub research questions will be answered and the main research question and objective of the research is discussed. These insights emerging from practice are combined with scientific literature and lead to propositions regarding the relation between CSR and innovation. Finally, these propositions will combined in a model explaining the influence of CSR on NPD.

6.1 Answers to the research questions

Research question 1: How is success in NPD projects measured?

From the interviews it became clear that for evaluating success in all NPD projects, DSM Business Groups (BG) have more or less the same measurements. These are related to the financial value of the product developed, like the return on investment (ROI) of the project, the earnings before income tax and assets (EBITA), margins, projected sales, market share and profit. The exact values that decide whether projects are considered successful or not, differ between the BG’s. For example, some respondents stated that a ROI of 17 percent was the bottom line, whereas with other respondents it was 21 percent in their BG. This is probably due to the different product portfolio’s of the BG’s which range from commodities (e.g. coatings) to specialty products (food ingredients). Also, the projects need to meet a number of bottom line criteria regarding the CSR. Certain materials (such as ozone depleting substances) and practices (such child labor) are not accepted by DSM and projects making use of such materials in their internal processes or supply chains are stopped or altered. Apart from this, financial indicators are most important in the cases, as illustrated by the quotes below:

“Sustainability is nice and all, but making money is the reason why we are here in the first place”. – R&D Professional.

“We are evaluated upon terms as cash, EBITA, margins and that sort of characteristics, and of course we should have a certain volume to be interesting for the company. Sustainability is nice, but you will not get additional sales and subsequent rewards by means of this”. – Business Manager.

The sustainability characteristics of the products developed in the cases did not play a role in evaluating NPD success, but in some cases the sustainability characteristics of the product did influence the financial value of the product. For example, in a couple of cases sustainability characteristics of the product (such as the low energy use or removal of environmental unfriendly components) were major contributors to the competitive advantage of the product.

“The fact that our energy usage is so low enables us to make the product at a much lower price than our competitors”. –Project Leader.

“Without the sustainability characteristics of the product (which enabled energy and process time reductions for the customers) I don’t think this product would be flying”. –Business Manager.

These findings indicate that although sustainability characteristics can play a role in the success of NPD projects, sustainability itself is not evaluated as success measure. CSR orientation does not influence the formal evaluation of a NPD project. Thus, a possible relation between CSR orientation and NPD success cannot be explained by different success measures. The objective of research question 1 was to control this. Research question 1 can be answered as follows:

Success of NPD projects within DSM is assessed by means of a fixed set of economic measures such as projected sales, ROI, EBITA and profit. CSR orientation is not part of this formal evaluation of NPD project success.
Research question 2: What are important drivers for NPD success?
In the within and cross case analyses the drivers for success in these cases was evaluated and the 15 most important drivers of success in the cases were identified. Apart from the fact that these drivers emerged from the data analyses, most were also found in the literature review in chapter 4. This indicates that the analyses identified the 15 most important drivers of project success. Together, these drivers answer research question 2:

Fifteen important drivers (table 14) were identified by means of the within case and cross case analysis. These drivers are important for achieving NPD project success. In general, it can be argued that the more these drivers are present in NPD projects, the more successful these projects will be.

<table>
<thead>
<tr>
<th>Table 14: Drivers of NPD success</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Market Orientation</td>
</tr>
<tr>
<td>2. Supplier involvement</td>
</tr>
<tr>
<td>3. Technology Platform</td>
</tr>
<tr>
<td>4. Clear But Flexible Process</td>
</tr>
<tr>
<td>5. Third Parties (e.g. consultants)</td>
</tr>
<tr>
<td>6. Customer Involvement</td>
</tr>
<tr>
<td>7. Continuous improvement</td>
</tr>
<tr>
<td>8. Cross Functional Team</td>
</tr>
<tr>
<td>9. Business Model</td>
</tr>
<tr>
<td>10. Team Leadership</td>
</tr>
<tr>
<td>11. Team Commitment</td>
</tr>
<tr>
<td>12. Management Commitment</td>
</tr>
<tr>
<td>13. Goal Orientation</td>
</tr>
<tr>
<td>14. Prototyping and Launch</td>
</tr>
<tr>
<td>15. Communication</td>
</tr>
</tbody>
</table>

Research question 3A: Does CSR orientation influence the NPD projects?
All of the respondents were aware of the fact that DSM is committed to become more social responsible. All of the respondents also stated they noticed this in their daily job. As became apparent during the data analysis, the DSM CSR orientation influenced NPD professionals in two different ways, formal and informal.

In recent years, DSM introduced CSR related regulations and procedures in the NPD development process (appendix K). These regulations have to ensure that the products developed by NPD teams are as Social Responsible as possible. For example, teams need to evaluate all the raw materials in the products under development to make sure no toxic or environmentally unfriendly materials are used. Furthermore, these regulations focus on optimizing energy use and minimizing waste. These rules are part of the formal evaluation of each stage of the NPD process. These regulations refer to a formal CSR as they are stated clearly and are part of the formal NPD process. DSM is doing more and more to promote CSR within the company. For example, DSM employees are receiving training and can join workshops on CSR and board members communicate its importance frequently via internal media. To illustrate this, a quote from one of the corporate newsletters is given:

“Sustainability is the mainstay of our vision. The principal value that is understood and embraced more and more by our organization, and pays for itself by identifying business opportunities.”– Managing Board member in DSM Nieuws.

This quote illustrates the importance DSM attaches to CSR and that it is not only communicated in direct relation with the tasks of employees, but also as a broader concept. This process of making all DSM employees aware of the importance of CSR is referred to as informal CSR. The analysis of the data learned that the corporate CSR orientation has an influence on NPD in two distinct ways; triggering new NPD projects and influencing drivers of NPD success.
Question 3A can thus be answered:

The corporate CSR orientation was found to have a two way influence on NPD team members. Formally, by leading to compulsory new rules and regulations and informally, by creating awareness of the importance DSM attached to this topic. By doing this, the CSR orientation influences some drivers of NPD success and triggers new NPD projects.

Research question 3B: How does CSR orientation influence NPD projects?

As stated above, the CSR orientation of the company was found to influence drivers of NPD projects and to trigger new projects. As shown in table 15, several relations between the CSR policy and NPD project success drivers are evaluated. Six out of the 15 drivers of NPD success as found in research question 2 have an obvious relation with CSR. CSR orientation was found to be linked with:

1. Market Orientation
2. Customer Involvement
3. Supplier Involvement
4. Management Commitment
5. Team Commitment
6. Continuous Improvement

Two more drivers (i.e. Third parties and Goal orientation) were found to have a link with CSR, but for both these drivers only one fragment supporting this relationship was found. Therefore, it was decided to focus on the six drivers above in the result analysis and theory development. When these six drivers listed above are examined, a division in three aspects can be made: commitment, cooperation with other supply chain parties and project improvement.

First of all, respondents indicated that both managers and NPD professionals were more likely to commit themselves to projects with strong CSR characteristics than other projects. For example, projects that offer health benefits for consumers or can be used in solar panels, were found more likely to get support from managers. Respondents also indicated that NPD professionals were likely to put more effort in these types of projects than in others. This can be explained by the CSR orientation of the company. Projects with strong CSR characteristics often serve as examples. However, CSR orientation only has an influence on commitment. If a NPD project already has CSR characteristics. Projects without such characteristics will not receive extra commitment.

Second, the data analysis showed that because of the corporate CSR orientation NPD project teams were stimulated or enforced to involve suppliers, customers and consumers in the NPD process. As an effect of the CSR orientation, the company holds itself responsible for activities in their entire supply chain. A formal statement of DSM is shown in appendix L. To ensure that other parties in the supply chain act according to the company’s standards, NPD teams need to communicate with these parties and involve them in the NPD process.

Finally, the CSR orientation was found to lead NPD teams to focus on constant improvement of the product and underlying processes. This was partly triggered by regulations, which requires a review of all processes and material input at every stage of the NPD process. Such a review needs to be done to optimize all incoming and outgoing material flows. Next to this, respondents also stated that they were constantly investigating possibilities for decreasing material use, energy intake and waste. Respondents stated the commitment of the company towards CSR as one of the incentive to do so. Besides the influence the CSR orientation had on the drivers, it also played a role in triggering new NPD projects. Because of the CSR orientation of the company, respondents stated that they were now involved in starting up new projects that would focus on finding new, sustainable technologies. This type of activities does not differ too much from the continuous improvement of NPD success drivers. Both refer to innovative activities of NPD project members triggered at least partly by the corporate orientation.
Table 15: Relation between NPD success drivers and CSR

<table>
<thead>
<tr>
<th>Drivers</th>
<th># Fragments</th>
<th># Respondents (Cases)</th>
<th>Sample Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>4</td>
<td>3(2)</td>
<td>“In order to come up with products that are accepted by the market, you really need listen to the market, that is the most important variable. Not only to our direct customers, but also to their customers. You see that our focus on sustainability and that of the market are quite similar.”</td>
</tr>
<tr>
<td>Supplier Involvement</td>
<td>14</td>
<td>8(4)</td>
<td>“The policy requires us to have all our suppliers sign a code of conduct. This usually also implies that we have to inform them about our values and drive towards sustainability. Furthermore, we have to exactly understand the products we are sourcing and are encouraged to ask suppliers to improve their products or processes. In all, suppliers play a much bigger role in our product development than a couple of years ago.”</td>
</tr>
<tr>
<td>Customer Involvement</td>
<td>9</td>
<td>7(3)</td>
<td>“By means of the Life Cycle Analysis, we now understand our customers markets better than they do themselves. We can indicate where they experience pain and provide solutions.”</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>12</td>
<td>9(5)</td>
<td>“To me, the fact that sustainability is incorporated in every review moment of the PMP process triggers me to continuously review my own projects to see whether changes can be made to make products better or less harmful. That’s the direction we should be moving to.”</td>
</tr>
<tr>
<td>Business Model</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Leadership</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team Commitment</td>
<td>6</td>
<td>2(2)</td>
<td>“This product is cleaner and better. People want to be part of such a project.”</td>
</tr>
<tr>
<td>Management Commitment</td>
<td>8</td>
<td>5(3)</td>
<td>“Of course, the management will look whether we can earn money, but if you come up with something that is cleaner, healthier or more efficient, there is often cash available.”</td>
</tr>
<tr>
<td>Cross Functional Teams</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Orientation</td>
<td>1</td>
<td>1(1)</td>
<td></td>
</tr>
<tr>
<td>Prototyping and Launch</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Projects</td>
<td>5</td>
<td>3(3)</td>
<td>“The triple P policy plays a clear role in where we are focusing our attention on in the future. We now start two project not directly fixed on developing new products, but focused on developing sustainable alternative technologies for solvents for our future products.”</td>
</tr>
</tbody>
</table>
Finally, a distinction between the influence of formal and informal CSR can be made amongst the above discussed drivers (table 16). As mentioned above and shown in appendix L, other parties are involved as a result of CSR orientation. NPD teams are required to involve these parties in the process. This is not the case for the other drivers. There are no strict rules that oblige NPD teams to show commitment or focus on improvement. Therefore, these are observed as influenced by informal CSR.

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Formal/Informal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>Formal</td>
</tr>
<tr>
<td>Supplier Involvement</td>
<td>Formal</td>
</tr>
<tr>
<td>Customer Involvement</td>
<td>Formal</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>Informal</td>
</tr>
<tr>
<td>Team Commitment</td>
<td>Informal</td>
</tr>
<tr>
<td>Management Commitment</td>
<td>Informal</td>
</tr>
<tr>
<td>New Projects</td>
<td>Informal</td>
</tr>
</tbody>
</table>

Research question 3B can thus be answered:

**CSR orientation is influencing NPD in three distinct ways.**

1. **It enhances commitment from both managers and employees to be involved in projects that possess CSR characteristics. More resources are available to these types of projects.**
2. **It triggers cooperation and communication with external parties (i.e. suppliers, customers and consumers). In order to make sure DSM’s products are used in line with the CSR orientation of the company, these parties need to be involved in the NPD process.**
3. **It triggers innovation by the initiation of new NPD projects or changes in existing ones, based on the strong focus of DSM to ensure optimal use of resources internally and for its customers. Some employees respond to this by taking up own initiatives to make improvement and develop products that address social and environmental issues.**

Research question 4: Do NPD projects that are more in line with the organizations CSR orientation likely to be more successful than other NPD projects?

To examine this, first all six cases should be ranked based on their perceived success and sustainability. It was found impossible to do such ranking based upon hard criteria (such a sales volume or carbon dioxide emission). Reasons for this were the different nature of the projects, the large number of variables for describing success and sustainability and finally the exceptional difference in market conditions between the first interview in October 2008 and last interview in January 2009. The within case and cross case evaluation of the six cases were not sufficient to evaluate which project was most successful (because of different markets they were involved in) and which was most CSR compliant. Based on the interviews and case documentation alone, no conclusions regarding a relation confirms that better and worse performing cases on both scales were selected. However, the answers to research questions 2 and 3 do offer interesting insights. Based upon the answers to these questions, CSR orientation is predicted to stimulate some drivers of NPD success. Projects more compliant with the CSR orientation of the company can be argued to outperform other projects because they pay a lot of attention to those important drivers. Furthermore, as indicated in question 3B, these projects will get more commitment from both top management
and team members. This also predicts that projects more in line with the corporate CSR orientation will outperform other NPD projects.

Research question 4 is answered:

With a sample of just six projects, finding strong relations between broad concepts as sustainability and success was not possible. The findings of RQ 2, 3A and 3B predict a positive relation between CSR and NPD performance. By means of enhanced market orientation, supplier involvement, customer involvement and focus on continuous improvement, CSR focus in projects is likely to make them more successful. Furthermore, projects showing CSR characteristics will be likely to be more successful because they are subject to more commitment from the team members and top management.

6.2 Proposition development

With the data retrieved in the previous process, it is now possible to return to the main research question as stated in chapter 2:

Does a strategic CSR orientation influence NPD projects and if so, what are the mechanisms behind this relationship?

The analysis gave some relevant insight in answering this question. In this section, these findings will be critically evaluated and compared to earlier studies on the topic. This will make it possible to construct hypothesis regarding the influence of CSR orientation on NPD projects. Three interesting area’s were identified. First of all, the relation between CSR and contact with external parties was identified. Second, the relation between CSR and initiation of innovative actions or projects was found and finally, a link relation between CSR and commitment was found.

CSR and NPD via external party involvement

It was observed that CSR orientation leads to market orientation, supplier involvement and customer involvement. These activities, in which organizational boundaries are crossed, are often referred to as boundary spanning activities (Carlile, 2002; Huber, 1991). This finding is consistent with some recent findings of Geffen and Rothenberg (2000), Baden et al. (2008) and Harwood and Humby (2008) on the field of supplier involvement and Simpson et al. (2007) on the field of market orientation and customer involvement. These authors argue that the relation between CSR and boundary spanning activities lays in the responsibility a CSR orientated company takes for the actions of its supply chain partners. CSR objectives, such as energy minimization, labor standards or refraining from use of certain materials are not very effective when they are only done within company boundaries. For example, to make sure no child labor is used in the products a company delivers, not only the internal operations should be monitored, but also those of suppliers and customers (Cousins et al., 2004; Harland et al., 2003; Walker et al., 2008). Failing to do so can lead to scandals such as recently happened at Mattel and Nike (Maak, 2008). Thus, companies engage in boundary spanning activities to minimize the risk of being associated with parties that do not have the same standards as the company itself. Cousins et al. (2004) argue that the larger the perception of this risk, the more strategic and advantaged supplier involvement will be. Hence, CSR orientated companies will do their best to reduce the risk of being associated with non-compliance of their supplier, and thus will have an incentive to cooperate with them. Hence, adopting a CSR orientation will be likely to lead to forms of supplier involvement, which is confirmed by research of Geffen and
Rotherberg (2000) and Miles and Munilla (2004). The same line of reasoning can be used in the context of customer and consumers by arguing that CSR will stimulate product stewardship and demand management (e.g. Berry and Rondinelli, 1998; Klassen and Vachon, 2003). These claims are also supported by real-life examples. Next to DSM (appendix L) HP (Miles et al., 2006) and Cargill (Cargill sustainability report, 2007) actively encourage customer and consumer communication as result of their CSR orientation.

This study confirms studies of Lagrosen (2005), Fang (2008) and Wagner and Hoegl (2006) regarding the importance of supplier – and customer involvement in NPD projects. Especially in the light of CSR orientation, where such cooperation is often found to be in the interest of a greater good, the conditions for knowledge sharing can be especially beneficial. For example, willingness and ability to share knowledge between different parties is of major importance for effective knowledge transfer (Faems et al., 2007). CSR orientation can increase the trust or confidence partners have in the specific firm (Surie and Ashley, 2007). In this light, the greater knowledge sharing between for example Toyota and its suppliers compared to GM suppliers can be related to the more sustainable or ethical approach of Toyota (Dyer and Nobeoka, 2000; Van Raaij, 2008). Also the findings regarding the involvement of other parties and its relation to NPD success are present in literature. For example Helper and Sako (1995) report on the increased importance of supplier involvement in NPD, whereas Zirger and Madique (1990) and Im and Workman (2004) report respectively on customer involvement and market orientation. If higher levels of CSR orientation thus lead to higher levels of boundary spanning activities and subsequent information sharing it can thus be stated that (figure 12):

**Proposition 1**
Higher levels of CSR orientation will lead to improved NPD project success by increased boundary spanning activities such as (A) supplier involvement, (B) customer involvement and (C) market orientation.

![Figure 12: Proposition 1](image)

Recently, some studies have proposed similar propositions (e.g. SustainAbility, 2008), but without any empirical validation and mainly solely focused on supplier involvement.

**CSR and NPD via innovative actions and projects**
The second way in which CSR was found to have an impact, was the area of optimization and new idea generation. The data analysis showed that in certain cases these activities were stimulated or steered by the CSR orientation of the firm. Both themes (continuous improvement and new project initiation) appear to be closely related. Both refer to new
activities initiated by NPD team members. The only difference is that continuous improvement refers to activities within the NPD project boundaries and new project initiation refers to activities outside the NPD project boundaries (leading to new NPD projects). Both however are new activities which are (at least partly) triggered by the CSR orientation of the company. NPD teams members are made aware of the strategic direction of the company and start to employ new activities to comply with this direction.

To explain this relation, literature on corporate entrepreneurship was explored. Corporate entrepreneurship (also referred to as intrapreneurship) can be defined as the process whereby an individual or a group of individuals, in association with an existing organization, creates a new organization, or instigates renewal or innovation within that organization (Sharma and Chrisman in Des et al., 2003). Research on this topic focused on the organizational conditions that make individuals or groups of individuals initiate such a renewal or innovation. Empirical research regarding the influence of CSR on entrepreneurial behavior is scarce, but one of the few studies that address both topics shows a significant correlation between CSR and entrepreneurship (Menguc and Ozanne, 2005). Also, examples described by Hanna et al. (2000) show a pattern of spontaneous individual or team activities, partly initiated because of social or environmental concerns. Finally, a study by Ramus and Steger (2000) shows that organizational policies towards environmental performance can trigger creativity.

When the drivers of corporate entrepreneurship are observed, it is possible to draw a theoretical relation with CSR. For example, attention to the organizational environment (Barring and Bluedorn, 1999), long term orientation (Menzel et al., 2006), proactive attitude (Barring and Bluedorn, 1999), emphasis on need and opportunities for change (Alvarez and Busenitz, 2001; Shane and Venkataraman, 2000) are described in literature as enablers and/or drivers of entrepreneurial activities. These elements can be argued to be the direct effect of a CSR orientation, which is usually focused on environmental awareness, communication of the need and opportunity to change and normally aim for long term advantage. Similar findings have been reported by Hemingway (2005). In this light it can be argued that:

“….managers who embrace sustainability principles are providing a stimulus for corporate entrepreneurship that result in discovery or creation, assessment, and exploitation of entrepreneurial opportunities, …., and ultimately, competitive advantage” (Miles et al., 2008).

This statement is strengthened by this study. Therefore it is stated that (figure 13):

**Proposition 2**

A: Higher levels of CSR orientation will lead to improved NPD project success by increased entrepreneurial activities.

B: Higher levels of CSR orientation will lead to improved NPD project success by the creation of new NPD projects.
Some conflicting literature on this topic exists. For example, Hemmingway (2005) and Rodrigo and Arenas (2007) find that not all employees will react positively when a CSR orientation is adopted by the organization. These authors argue that - in line with motivational theories- companies should make sure that basic needs of employees are fulfilled. For example, employees coping with bad labor circumstances will perceive CSR activities as wasted money and will not be affected (maybe even demotivated) by it. In general however, the authors support the analysis above.

**CSR and NPD via commitment**

The third group of codes which related project success and CSR were those labeled as commitment. This relation however, was found to have a different structure than the relations sketched above. If a CSR orientation is seen as a strategic guideline for both managers and employees, it can be argued that it has an influence as such. Bart (1997) and Uncles (1995) find that organizational mission statements are important in influencing employee and management behavior and satisfaction and Hanna et al. (2000) find that organization (intrinsic or extrinsic) rewards are also in line with these forms of strategic orientation. Finally, in the field of environmental issues (an important aspect of CSR) Hanna et al. (2000) suggest that more involvement and shared vision is likely to occur in projects with a beneficial environmental impact. In this light, in is not surprising that in firms with a strong CSR orientation, more management commitment and management support will arise around projects with perceived sustainable characteristics. This observation shapes the third important observation of this study.

**Proposition 3:**

In firms with a strong CSR orientation, team member and managers will be likely to receive more intrinsic and extrinsic rewards when they are associated with more sustainable products. CSR Orientation therefore moderates the relationship between product characteristics and management and team commitment.
The same issues that were evaluated in proposition 2 can also play a role in this proposition. The relation can be assumed only to occur in a setting, where employees are generally satisfied with their jobs. Otherwise, it might raise feelings of inequity and thus reduce commitment, as proposed by Hemingway (2005).

6.3 Conclusions and model development
Combining the three stated propositions a model can be developed of how CSR orientation can induce innovation and support innovation projects. Figure 15 shows this overall relationships connecting CSR Orientation, NPD project success and innovativeness. Also, the relation that was the subject of the initial research question is depicted in the figure 15. The figure shows that the final model answers and further specifies the research question. The influence of commitment was not incorporated in the model, because of the moderation effect as was described above.

Figure 15: Final model
CSR Orientation
As stated before, the distinction between formal and informal CSR is important. Formal CSR refers to regulation and procedures that are communicated by management and imbedded in organizational processes. Contrary, informal CSR is the personal awareness and importance of an employee or manager. Both can be influenced by corporate management. The formal CSR by compulsory rules and/or procedures, the informal CSR can be achieved by means of more informal communication like internal communication, storytelling, workshops (appendix M). More formal regulation will probably also arouse personal awareness, and employees with higher level of informal CSR will might take such regulation more seriously. This relation was not subject of this study and therefore purely theoretical, which is depicted in figure 15 by the dotted lines.

Boundary spanning and corporate entrepreneurship
As explored in the sections above, CSR orientation can stimulate both boundary spanning activities and stimulate corporate entrepreneurship. The results show that the firms CSR orientation has a positive influence on both these aspect. Boundary spanning here involves ‘market orientation’, ‘supplier involvement’ and ‘customer involvement’. The more formal aspects of the CSR Orientation were found to have an important influence on this category, although in certain cases also personal values triggered these activities (table 17). This difference in influence is graphically depicted in figure 15 by the thickness of the arrows.

Table 17: Grouping of CSR influenced drivers

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Category</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Orientation</td>
<td>Boundary Spanning</td>
<td>Formal</td>
</tr>
<tr>
<td>Supplier Involvement</td>
<td>Boundary Spanning</td>
<td>Formal/Informal</td>
</tr>
<tr>
<td>Customer Involvement</td>
<td>Boundary Spanning</td>
<td>Formal/Informal</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>Corporate entrepreneurship</td>
<td>Formal/Informal</td>
</tr>
<tr>
<td>Team Commitment</td>
<td>Commitment</td>
<td>Informal</td>
</tr>
<tr>
<td>Management Commitment</td>
<td>Commitment</td>
<td>Informal</td>
</tr>
<tr>
<td>New Projects Initiation</td>
<td>Corporate entrepreneurship</td>
<td>Informal</td>
</tr>
</tbody>
</table>

The corporate entrepreneurship activities (in this study labeled as ‘Continuous Improvement’ and ‘New Project Initiation’), where found to be stronger influenced by informal CSR orientation. This makes sense, because it involves creativity that is hard to incorporate in formal regulation. But sometimes formal review moments were also important in triggering new ideas for project optimization. Boundary spanning and corporate entrepreneurship can influence each other. Higher levels of boundary spanning activities can create larger knowledge bases employees can use to start new activities upon, whereas more new activities can create new cooperation with other parties across organizational boundaries. Miles et al. (2006) found that those employees engaging in boundary spanning activities are in the best position to oversee capabilities and opportunities and thus engage in entrepreneurial activities. New activities (markets, technologies etc) are likely to lead to the involvement of new customers, supplier and other stakeholders, thus creating a larger knowledge base.

NPD success and innovativeness
Finally, the influence of boundary spanning activities and corporate entrepreneurship were evaluated. Boundary spanning activities were mainly found to be related to the improvement of existing products of NPD projects. In some cases however, new projects were initiated based on these activities. Corporate entrepreneurship was found to be influential in both the improvement within projects, but also to initiate new projects. Also here, a relation between new project start up and project success can be drawn. Better and more new project initiation
can results in higher levels of NPD success, as enhanced NPD success can make new resources available to initiate new projects.

### 6.4 Conclusion

This chapter answered the research questions and evaluates the implications of these answers. The insights obtained in this study are compared to literature on similar and adjacent fields of scientific research and then developed into three main propositions. These summarize the main results of the study. It is concluded that CSR has a positive influence on innovation by stimulating boundary spanning activities and corporate entrepreneurship. Next to this, CSR is found to have a mediating influence on the relationship between NPD project characteristics and team and management commitment.
7 Conclusion, Implications and Limitations

This section reflects upon the study. First the research methods and results are discussed. Then, the implications for both researchers and practitioners are evaluated. Finally the limitations of the study are described and directions for further research are given.

7.1 Conclusion

This study has evaluated the relation between CSR orientation and the development trajectory of NPD projects. As concluded in the sections above three main categories of activities were influenced by the orientation. On boundary spanning activities and corporate entrepreneurship, CSR orientation was found to have a direct stimulating influence. On creating commitment for certain types of projects, a moderating influence of the orientation was found. This study is one of the first to address the potential opportunities related to CSR orientation and to support its claims with empirical evidence. It builds a bridge between the risk reduction and compliance driven nature of CSR adoption and its potential for opportunity seeking competitive advantage or value creation. By doing this, it answers the calls of researchers (Knox and Maklan, 2004; MacGregor and Fontrodona, 2008) to more empirical research on this topic. Apart from this, the study shows the difference between informal and formal CSR orientation and the fact that both are important in an organizational setting. Combined, these findings show that companies engaging in CSR in a thought-through (strategic) manner can achieve benefits in the form of new or improved innovation projects. Combining a formal and informal CSR orientation can lead to higher levels of boundary spanning activities and corporate entrepreneurship, creating new insights and ideas which in turn leads to improved NPD performance (Sethi et al., 2001) and with that organizational performance (Brockhoff in Weerd-Nederhof, 2001). The findings are encouraging for companies already engaging in CSR activities and contribute to the academic debate whether or not a business case for CSR can be built.

The methods used to achieve these results are mostly qualitative of nature. From six NPD projects, team members were interviewed and documentation was studied. The interviews were conducted largely unstructured, enabling the respondent (rather than the interviewer) to lead the interview. This method of interviewing ensures objective data is collected. At the same time, it makes it likely that the results of this study understate the actual prevalence of the model as developed above (Ashforth et al., 2007). Because the respondents lead the interviews, not all interviews handle exactly the same topic, making it likely that not all information regarding the cases is obtained. This makes the theory developed likely to be even stronger than the results of this study indicate. The interviews were transcribed and coded to make also the data analysis as objective as possible. By combining multiple sources of evidence, multiple cases, replication logic and the development of an interview framework, validity and reliability of the study were ensured (Yin, 2003). Combined, the results and the methods underlying them make this a relevant and reliable study that provides practitioners and researchers with valuable insight and can be used as a lead for further research on the topic.

7.2 Implications for researchers and practitioners

Since the objective of this study was to build theory regarding the influence of CSR on innovation, the result is a general theory rather than specific pre-set rules that can be used in well-defined situations. Therefore, first the directions for future research will be addressed. Because of the in-depth insights generated in the case studies also a number of recommendations for the company studied and practitioners can be given. This will be done after the recommendations for researchers.
**Directions for future research**

For researchers, this study is a next step towards the development of a business case for CSR. The relation between CSR and innovation is a rarely studied topic, but offers a great promise for companies. Relating both concepts offer managers the possibility to strengthen the societies they operate in and their own organization’s competitive advantage simultaneously. First, the implication of this study for existing theories is evaluated. Than, directions for future research in the field are sketched. Finally, the finding of a distinction between formal and informal CSR and its importance for research are discussed.

The Porter Hypothesis was taken as the starting point of this study. Reflecting upon the results of this study, the outcome seems to be in line with the proposition as stated by Porter. Also in a within company setting, focus and regulation enforcing CSR can foster innovative behavior. With that, this study is one of the first to address the relationship between CSR and innovativeness and explore the mechanisms behind this relationship in-depth. It expands findings of Horbach (2007) and Rennings (2003) towards an organizational context. Furthermore, it reinforces the theoretical relations sketched by Miles et al. (2008) and Hemingway (2005) regarding the link between CSR orientation and entrepreneurship, with a form of empirical evidence for the first time. By combining the findings with adjacent fields of literature (like supply chain management, boundary spanning and corporate entrepreneurship) this study shows that relationships between these fields are possible. This indicates that better understanding of CSR and its direct effects can lead to a lot of additional findings, without need for additional empirical research.

Future research can focus on testing this propositions in a more formalized multiple company context. As much as possible, constructs that already exist in literate are adopted, making more quantitative methods such as questionnaires possible. When these relations are confirmed, they could even be translated into a cross-organizational context. By doing this, not only this theory can be validated, but also moderating variables such as firm size, industry type and country can be studied and/or integrated. In order to do so, first a methodology to evaluate and compare the sustainable performance of NPD projects should be developed. For this, the natural environmental orientation as developed by Menguc and Ozanne (2005) provides a promising starting point.

Multinationals are increasingly seeking competitive advantage by incorporating strong innovative suppliers in their supply chain. The findings here indicate that supply chain sustainability activities by these companies, do stimulate the innovative behavior of their suppliers. Researchers can focus on this relationship that indicates sustainability policies might strengthen a company’s base for competitive advantage in more than one way. Already, large multinational corporations are increasingly forcing their suppliers to adopt CSR policies (Geffen and Rothenberg, 2000). By encouraging suppliers to adopt CSR practices, companies can not only reduce the risk that the supply chains bring, but also ensure themselves of more innovative suppliers, ultimately leading to more competitive advantage (Carter, 2005) and organizational learning by means of social responsible procurement or investment (Carter, 2005; Mill, 2006). If the findings of this study are confirmed, there is no evidence that the relations depicted here, can not be translated to this dyadic perspective. Also, many other refinements of the theory developed here have to be tested. For example, Halme and Laurila (2008) make a case for differentiating different CSR policies and their outcomes. These researchers make a case for cluster analysis of different types of CSR policies and the differences in outcome of these policies. This would reinforce the findings and further analyze the working of CSR within an organization.
Finally, the distinction between formal and informal CSR is rarely made in literature. Most authors make a distinction between management systems and personal values (e.g. Argandona, 2004). Since here the focus is on the communication, perception and effect of a CSR orientation, the segmentation into formal and informal policy is adopted. In short, the notion formal CSR refers to the set of standardized rules and procedures aimed to incorporate sustainability into working practice. These formal management systems are generally perceived to achieve conformity (Collier and Esteban, 2007). Numerous authors (e.g. Argandona, 2004; Collier and Esteban, 2007; Knox and Maklan, 2004; Werre, 2003) realize that such standardized regulations are neither sufficient nor applicable in every situation. In some situations organizations should rely on their own values when decisions regarding CSR related issues have to be made. In such situations, the organizational members should understand the company values and acts according to them. This is seen as informal CSR. Researchers should focus on making the difference between formal and informal CSR explicit and further study the influence it has on drivers of company performance. By doing this, researchers could provide practitioners with valuable information regarding the strategic use of CSR.

Recommendations for DSM and its practitioners
As described in this study, DSM is a front-runner in the field of CSR and sustainability. The results of the study confirm that the company’s strategic focus on both innovation and CSR is one that can be mutually reinforcing. Of course, changes (innovations) are a prerequisite for products with lower impact on society and/or the environment. This study shows that a strong focus on these issues can also enhance innovative performance. Although this study was not concerned with the design and implementation of CSR (Moan et al., (2008) designed a methodology for this), based on the experiences in the case studies some recommendations can be given.

- For higher management
This study shows that creating a corporate CSR orientation does have an effect on operational level. The efforts a company takes trying to become more CSR orientated do pay off. Employees understand this effort and align their actions with it. Furthermore, it shows that CSR orientation does not only initiates actions that make the company more socially responsible, but also triggers/enforces other activities which can be beneficial for the company, such as boundary spanning. Finally it shows, that not only the rules and regulations that CSR brings help to make the company more sustainable. It is clear that employees also take this orientation into account in other actions, regardless whether rules and regulations are applicable to it. Although all respondents were aware of both the formal and informal CSR orientation of DSM, some believed that certain rules and regulations were not optimal for incorporating CSR in the NPD process. These respondents indicated that assessing the product under development on CSR issues is hard and can easily be manipulated. Furthermore, the respondents indicated that these regulations were mainly focused on internal energy and raw material efficiency. DSM should focus on developing strict rules for NPD projects, forcing teams to compare their product to for example the best performing competing product in the field. Furthermore, life cycle analyses should be more stimulated and maybe even obliged for new products. In this way, DSM can ensure that the developed products are the best alternative taking financial and CSR measures into consideration.

- For NPD managers
In line with the results of this study, NPD managers should encourage their teams to look over the organizational boundaries when developing new products. DSM should focus on further promoting boundary spanning activities and corporate entrepreneurship as a result of CSR. The example of life cycle analysis as outlined above will force NPD teams to take the entire
supply chain more and more into account. Such orientation was found to have a positive influence on the performance of NPD. Formal rules are not always necessary to trigger these changes. DSM could, for example also make its problems regarding CSR explicit for its employees and ask them to think along. In some forms this is already done by the company, but by addressing the exact problems BG’s are faced with, such actions can stimulate entrepreneurial behavior within the company even more. When employees show such entrepreneurial behavior, DSM NPD managers should stimulate this and encourage the employee to further develop such initiatives.

• For purchasers and marketers
Purchasers and marketers are key individuals when it comes to monitoring and communicating with other parties in the supply chain. These parties have contacts with customers and suppliers, have knowledge on trends and regulations in the supply chain and should therefore be key member of NPD teams. This study shows that the CSR can lead to boundary spanning, but only if those parties that stand in contact with the supply chain are involved. If not, NPD team members might take on the own initiative to look across organizational boundaries, but it is more likely that they will stay focused on the internal process, over which they have control and knowledge.

7.3 Limitations
Obviously, all research has its limitations. In this study, these limitations refer primarily to three factors; its qualitative nature the one firm focus and the maturity of the topic. First of all, the qualitative nature and research methods of the study have made it an excellent starting point for empirical validation. However, at the same time it makes the interpretations of the results somewhat questionable. As noted earlier, the methods used in this study had the primary goal of identifying possible influences of the CSR orientation of a certain company on its innovative performance. The methods used are designed to focus on this aspect and therefore lack some of the insight some, more quantitative methods offer. Although the underlying logic is strong, it is therefore hard to make any statements about the significance of the findings. This also holds for the relationships themselves. Too much attention for CSR can be argued to harm a relationship, as proposed by Boyd et al. (2007). Although the proposition developed imply a relationship, it is thinkable that this relation will not be linear and that an optimum is to be found. Next to that, because of the labor intensive methods, a study of six projects was the maximum sample achievable in this timeframe. Although small samples can also make a strong case (Eisenhardt and Greabner, 2007; Siggelkow, 2007) it makes it harder to generalize these findings.

Secondly, because all cases investigated were located in the same organization (though in different business units) the findings cannot be generalized. For example, firm size and industry can have a significant influence on such research. Buysse and Verbeke (2003) however, find that the nature of firms (domestic versus multinational) or industry do not significantly influence the environmental strategies they adopt.

Finally, some of the concepts assessed in this research are still quite young and ill-defined. In the empirical study this problem was tackled by doing qualitative case studies, because these enable in-depth understanding and explanation (Eisenhardt, 1989). Comparing the findings to literature is difficult. Some of the studies used to validate the findings or expand the theory, define CSR in another way than was done in this study. For example, some focus on environmental issues whereas others ignore these. The same holds for other streams of literature that are assessed in order to validate the findings. For example, Rupp et al. (2006) the relation between company orientation and employee involvement is relatively unstudied and not much is known about the chain of logic in adopting strategy. Some researchers
therefore propose that a strategic orientation (as CSR) is already a result of employee and managerial orientation. This could place some of the findings here in different perspective.
References


Babie, E. (1975) The practice of social research, Belmond, California, Wadsworth


Verschuren, P. (1991), Structurele modellen tussen theorie en praktijk, Utrecht, Het Spectrum


Wester, F. Peters, V. (2004), Kwalitative Analyse: uitgangspunten en procedures, Bussum


